Income and Wealth inequality after the financial crisis – the case of Germany

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Abstract

The topic of rising income inequality does not only gain in relevance since the two prominent reports by the OECD ("Growing unequal" and "Divided we stand") but rather since the financial crisis. So far there is only scarce empirical evidence about the consequences of the financial crisis on income inequality (e.g. Jenkins et al. 2013) and more important about wealth inequality given that a financial crisis in fact should have an impact on financial assets and net worth of private households.

This paper makes use of micro-data from the German Socio Economic Panel (SOEP) which is a representative longitudinal survey of private households in Germany. This survey provides consistent yearly information about incomes since 1984 and for wealth in the survey years 2002, 2007 and 2012. Thus we are able to identify any potential effects of the financial crisis on incomes (e.g. earnings, market income, post-government income) and wealth components (e.g. property, business assets, financial assets, net worth) in Germany.

Selected results are: Inequality of disposable incomes in Germany has decreased slightly since its peak in 2005. However, this trend did not continue in 2011. The most important reasons for this were the inequality in market incomes, including capital incomes, which had increased again. Besides this finding, the poverty risk rate (based on data from the federal statistical office) reached record highs in 2012. Income mobility over time is equally important in terms of social policy, i.e., the upward or downward movement of individual groups of people in the income hierarchy. Here, the most recent analyses confirm the trend of significantly decreasing income mobility since German reunification. For example, the odds of exiting the risk of poverty within a period of four years has dropped by ten percentage points to 46 percent in recent years.

Inequality of net worth remains stable over our 10-years observation period with a Gini-coefficient of 0.78 which is the highest compared to other European countries. Mean net worth slightly increased for total population but there is also shrinkage of net worth for bottom percentiles, i.e. the share of adults holding negative net worth has increased significantly. Looking at the wealth portfolio one can find a significant increase of adults

holding consumer credits, thus one could either argue this may an effect of the financial crisis, alternatively this may a reaction of private households to the low interest rates. Another finding is, that private pensions gain in relevance in Germany, which can be attributed to the general shift from public pensions as a means of old age provision towards private pensions. Analyses in terms of social positions indicate that there are only slight changes between social groups with one exemption: the unemployed significantly loose wealth over the last 10 years.

Keywords: Income inequality, wealth inequality, wealth portfolio, financial crisis, SOEP

JEL-Codes: D31, I31, I32

The analyses mainly based on two recently published DIW-papers:
Markus M. Grabka and Jan Goebel (2013). Reduction in Income Inequality Faltering. DIW-Economic Bulletin I-2013, p. 16-26.
and
Markus M. Grabka and Christian Westermeier (2014): Anhaltend hohe Vermögensungleichheit in Deutschland. DIW Wochenbericht Nr. 9/2014, p. 151-165.

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Introduction

This study updates previous research by DIW Berlin on income inequality in Germany up to 2011 and includes analyses of individual income mobility over time.[1] Data from the long-term Socio-Economic Panel Study (SOEP) gathered by DIW Berlin in collaboration with the fieldwork organization TNS Infratest Sozialforschung form the empirical basis.[2] Since the data is collected annually, it is possible to analyze consistent time series on the development of personal income distribution and to calculate individual upward or downward movements within that distribution.[3]

Average equivalized and inflation-adjusted market incomes of individuals in households remained virtually constant from 1991 to 1998 (see Figure 1 and Box 1). They initially increased significantly during the economic boom in the late 1990s, but then decreased steadily through 2005. It is likely that this development was driven primarily by the high unemployment at that time (see Box 2).

The significant decline in unemployment observed since then was accompanied by a trend reversal in income development. Since 2005, market incomes of households have increased markedly, but they have not yet significantly exceeded the 1999 level. The median of market incomes[4] in 2011 was still lower than in 1991. One of the reasons for this development is the demographic transformation of recent years. For example, the share of people of retirement age has been increasing for years in Germany, and as a result, the share of people with no or only low market incomes is also increasing.[5] Besides demographic effects, changes in wages and capital incomes also affect market incomes. Increases in negotiated wages were lower than the

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1 See most recently: M. M. Grabka, J. Goebel, and J. Schupp. "Has Income Inequality Spiked in Germany?," *DIW Economic Bulletin*, No. 12 (2012).

2 The SOEP is a representative, annually repeated panel survey of households which has been conducted in western Germany since 1984 and in eastern Germany as well since 1990; see G. G. Wagner, J. Goebel, P. Krause, R. Pischner, and I. Sieber, "Das Sozio-oekonomische Panel (SOEP): Multidisziplinäres Haushaltspanel und Kohortenstudie für Deutschland – Eine Einführung (für neue Datennutzer) mit einem Ausblick (für erfahrene Anwender)." *AStA Wirtschafts- und Sozialstatistisches Archiv* 2, No. 4, (2008): 301–328.

3 In accordance with the German Federal Government's Report on Poverty and Wealth (Federal Ministry of Labour and Social Affairs 2013: Life Situations in Germany) and the reports of the German Council of Economic Experts (most recently Annual Report 2012/2013: Stable Architecture for Europe – Need for Action in Germany), this report indicates the income year. The SOEP surveys annual incomes retrospectively for the previous calendar year, but weights them according to the population structure at the time of data collection. In other words, the data presented here for 2011 were collected in the survey wave 2012.

4 The median of the income distribution is the value that separates the richer half of the population from the poorer half.

5 For example, the percentage of individuals aged 65 or more years increased from 16.6 percent to 20.6 percent between 2000 and 2010, see Federal Statistical Office. *Statistical Yearbook 2013*. Wiesbaden, 2013.

general inflation rate from 2006 to 2011.[6]

The development is somewhat more positive when it comes to disposable household incomes (see Figure 2).[7] Equivalized and inflation-adjusted net household incomes increased markedly in the second half of the 1990s and from 2008 to 2010. Although the data for 2011 do show a slight decline, it is within the confidence band and thus does not represent a statistically significant change. As measured by the arithmetic mean, households had higher real incomes at their disposal in 2011 than ten years previously. In terms of the median, however, no significant change can be determined over the course of this period.[8]

The discrepancy in the development of the arithmetic mean and the median suggest that disposable household incomes have developed differently in various parts of the income hierarchy. If the population is divided into deciles[9] and the mean income per decile is indexed to the year 2000, it is evident that the highest income earners (top decile) in particular achieved above-average increases in real income (see Figure 3), which came to approximately 13 percent 2011. The eighth and ninth deciles also achieved slight increases in income of three to four percent. Incomes in the fifth to seventh deciles stagnated, while decreases in income of up to five percent, compared with the year 2000, were evident for the first through fourth deciles. The expansion of the low-wage labor market[10] and the weak development of retirement incomes, among other factors, appear to be relevant for income losses in the lowest income groups. Increases in the incomes of those in the highest decile, however, were caused by escalating incomes from capital investments and from self-employment.[11]

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6 R. Bispinck, "Tarifpolitischer Jahresbericht 2011: Höhere Abschlüsse – Konflikte um Tarifstandards," *WSI-Mitteilungen* No. 2 (2012): 131–140. See also K. Brenke and M. M. Grabka, "Schwache Lohnentwicklung im letzten Jahrzehnt," *Wochenbericht des DIW Berlin*, no. 45 (2011). According to the official national accounts, however, effective gross incomes per employed person were 9.5 percent higher in 2011 than in 2006. In light of consumer price increases of 8.7 percent during the same period, this amounts to a marginal increase in real wages. It cannot be ruled out that the figures for wages will also be adjusted in the course of the major revision of the national accounts data due next year.

7 Disposable household incomes consist of market incomes, statutory pensions as well as state transfer payments such as child benefits, housing assistance, and unemployment benefits, minus direct taxes and social security contributions.

8 One reason for stagnating real incomes is the weak development of pensions in the statutory pension insurance scheme. For example, pensions were not increased at all in 2010 and rose by only 0.99 percent in 2011, resulting in losses of income in real terms.

9 To obtain deciles, the population is sorted according to level of income and then divided into ten groups of the same size. The lowest (highest) decile represents the income situation of the poorest (richest) ten percent of the population. It should be noted that individuals can change their income positions over time because of income mobility and should not be assigned to the same decile every time.

10 T. Kalina and C. Weinkopf (2013): Niedriglohnbeschäftigung 2011. Weiterhin arbeitet fast ein Viertel der Beschäftigten in Deutschland für einen Niedriglohn. IAQ Report 01-2013, Universität Duisburg Essen; and K. Brenke, "Long Hours for Low Pay," *DIW Economic Bulletin*, no. 9 (2012).

11 For example, according to the national accounts, the percentage of incomes from capital investments and

Income inequality

The Gini coefficient is a standard measure of income inequality. It can have values between 0 and 1. The higher the value, the greater the inequality. According to this measure, inequality in market incomes in Germany increased almost continuously—from 0.41 to 0.5—from reunification in 1990 to 2005 (see Figure 4). In the following years, inequality declined; however, this trend has not continued recently—there was no evidence of it in 2011. Alternative measures of distribution from the group of generalized measures of entropy, such as the Theil index and the mean log deviation (MLD)—which is particularly sensitive to changes at the lower end of the income hierarchy—confirm the picture portrayed by the Gini coefficient, even if the MLD coefficient for 2011 remains significantly lower than its historical peak in 2005. Apparently, the main reason for the decline in inequality of market incomes since 2005 was the marked improvement of the situation on the labor market.[12]

The slight increase in inequality of market incomes in 2011 can be ascribed to the inequality of capital incomes, which is increasing again, as well as to rising inequality in earned incomes. Profit withdrawals and dividends have increased considerably, and stock markets have recovered markedly since 2009.[13] In 2011, the Gini coefficient of capital incomes almost reached its historical peak of 2005 again (see Figure 5).

The trend of increasing income inequality up to 2005 is also apparent in disposable household incomes (see Figure 6), as shown by the Gini coefficient, which rose from just under 0.25 in 1991 to 0.29 in 2005. The decrease from then until 2010 was statistically significant only at the 90-percent confidence level, and the decline ended again in 2011. The reasons for this are the same as those in the analysis of market incomes. The additional components of disposable income (public transfer payments, such as child benefits and means-tested unemployment benefit (unemployment benefit II, *Arbeitslosengeld II*), social security pensions as well as direct taxes and social security contributions) barely lessened the effects of the recent increase in inequality of market incomes on disposable incomes.

Even though the decline in income inequality was not very pronounced from 2006 onwards,

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entrepreneurial activity relative to the entire national income has become relatively more important. However, these types of income are concentrated mainly in the highest decile of income recipients.

[12] For example, the working population increased by 2.6 million to 41.2 million from January 2005 to January 2012, Federal Statistical Office 2013: www.destatis.de/DE/ZahlenFakten/Indikatoren/Konjunkturindikatoren/Arbeitsmarkt/karb811.html.

[13] For example, the value of the German share price index DAX was 3,666 points and more than doubled to 7,527 by May 2, 2011.

and slowed in 2011, it does seem remarkable compared with other countries: analyses by the Organisation for Economic Co-operation and Development (OECD) reveal a trend of increasing inequality of disposable incomes—as measured by the Gini coefficient—for the majority of OECD member states (see Figure 7). The development is most striking in the Scandinavian countries and France.

Polarization and relative income poverty

The concept of income polarization was originally introduced to analyze the shrinking middle-income class (see Box 3). This concept allows us to determine whether the gap between different income classes has grown larger or smaller over time. Polarization increases in particular if the margins of the income distribution (the poor and the rich) grow larger while the middle section dominating the income distribution loses significance.

The concept of polarization is not always clearly differentiated from that of inequality in empirical studies. Classical indices of inequality measure the distance between incomes within a society. Polarization, in contrast, focuses not only on the distance between incomes, but also on possible groupings of these incomes along the income dimension, for example on the numbers of people with low or high incomes relative to those in the middle income segment.

In other words, when measuring income polarization, two dimensions must be differentiated as a matter of principle, namely homogeneity within the groups and heterogeneity between the groups. Since publication of the paper by Esteban and Ray in 1994,[14] efforts have been made to combine the two dimensions of polarization in a single index. Fundamental to these indices is the reference system of identification and alienation. The idea behind it is relatively simple: Polarization occurs when the different (income) groups become alienated from one another and at the same time, the people within one (income) group identify with it.

Polarization and growing inequality do not necessarily occur at the same time. It is even possible for inequality to decrease despite increasing polarization. For example, the differences within the groups at the margins of the distribution may decline while the income gap between the groups increases.

In the following, two alternative measures of polarization are used, one based on the work of

[14] J.-M. Esteban and D. Ray, "On the measurement of polarization," *Economica*, 62, no. 4 (1994): 819–851.

Duclos, Esteban, and Ray, the other on Foster and Wolfson (see Figure 8).[15] Both indices show a progression similar to that of the indices for measuring the inequality of disposable household incomes. In the 1990s, income polarization stagnated, only to increase significantly from the turn of the millennium to 2005. Since then, both indices have remained high, even though polarization has recently been increasing again slightly.[16]

The concept of relative income poverty defines a person as at risk of poverty if he or she has less than 60 percent of the median of the total population's net household income available. According to that, the at-risk-of-poverty threshold in 2011, based on the SOEP sample, was approximately 980 euros per month for a single-person household.[17]

In recent years, the poverty risk has largely developed in parallel to the progression of income inequality and income polarization (see Figure 9). Up until the mid-1990s, the poverty risk in Germany was roughly 12 percent—with the rate higher overall in eastern Germany than in western Germany. In the years preceding the turn of the millennium, poverty risk declined slightly to 10.5 percent. Since then, it has risen—with minor fluctuations—to a peak of 15 percent in 2009. One of the causes is presumably short-time work, which was widespread during the economic crisis at that time.[18] In the last two years of the study (2010 and 2011), the at-risk-of-poverty rate in Germany initially declined slightly, but has remained at a constantly high level since then—and is lower than the European Union average.[19]

Income Mobility Since Reunification

It is not only the development of the at-risk-of-poverty rate which is relevant from a social-policy point of view. After all, the question whether people on low incomes have only short-term poverty-risk experiences or remain in the low-income range for a longer period of time is of no lesser importance. To answer such questions, mobility matrices are frequently employed

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[15] J.-Y. Duclos, J. Esteban, and D. Ray, "Polarization: Concepts, Measurement, Estimation," *Econometrica* 72 no. 6 (2004): 1737–1772; and J. E. Foster and M. C. Wolfson, "Polarization and the decline of the middle class: Canada and the U.S.," *Journal of Economic Inequality* 8, no. 2 (2010): 247–273.

[16] On the trend of increasing polarization in Germany see J. Goebel, M. Gornig, and H. Häußermann, "Polarisierung der Einkommen: Die Mittelschicht verliert," *Wochenbericht des DIW Berlin*, no. 24 (2010).

[17] Compared to social reporting by the Federal Statistical Office based on the microcensus (see www.amtliche-sozialberichterstattung.de), a higher at-risk-of-poverty threshold is given here, as the rental value of owner-occupied housing, among other things, is included in measuring income. On further methodological differences to official social reporting, see M. Grabka, J. Goebel, and J. Schupp, (2012), "Has Income Inequality Spiked in Germany?," *DIW Economic Bulletin*, No. 12.

[18] For example, the number of workers on short time averaged 1.1 million in 2009, see Federal Employment Agency: *Der Arbeits- und Ausbildungsmarkt in Deutschland.. Mai 2012. Monatsbericht*, 2012.

[19] See Eurostat (2013): In 2011, 24% of the population was at risk of poverty or social exclusion. Newsrelease 171/2012.

to compare relative income positions at the beginning and end of a four-year period.[20,21] The relative positioning within the income hierarchy is subdivided here into seven groups.[22]

It is evident that mobility at the margins of the income distribution was greater in the mid-1990s than in the 2000s. For example, 44 percent of those individuals on low incomes in 1994 (with less than 60 percent of median income) were still in the same position in 1997 (see table).[23] From 2008 to 2011, the corresponding share increased to 54 percent. Mobility also decreased at the upper end of the income hierarchy. Between 1994 and 1997, only 59 percent of people with an income of 200 percent or more of the median remained in their income class; since 2004, this figure has grown to 65 percent.

Overall, the probability of belonging to the same income group at the end of a four-year period as at the beginning remained virtually constant for individuals at risk of poverty in the 1990s (see Figure 10). At the turn of the millennium, however, it rose sharply and has been at roughly 55 to 60 percent since then. In the case of people in the highest income group, development has been steadier, with the rate of people remaining in their group increasing most recently to 65 percent.

Mobility between the middle-income groups is considerably more pronounced overall, as movements are possible in both directions. The Shorrocks-Prais[24] index and the Hart index[25] were used to summarize the income mobility of all groups. Both indices point to a significant decrease in income mobility in the 1990s since German reunification (see Figure 11). Since

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[20] Using a window of four survey waves corresponds to the procedure for determining the fourth Laeken indicator (persistent at-risk-of-poverty rate). See A.-C. Guio, *The Laeken Indicators: Some Results and Methodological Issues in Acceding and Candidate Countries.* Background paper prepared for the workshop "Aligning the EU Social Inclusion Process and the Millennium Development Goals,"April 26-27, 2004, Vilnius, Lithuania.

[21] These analyses refer to intragenerational mobility. Current findings on intergenerational mobility are to be found, for example, in D. D. Schnitzlein, "Wenig Chancengleichheit in Deutschland: Familienhintergrund prägt eigenen ökonomischen Erfolg," *Wochenbericht des DIW Berlin*, no. 4 (2013).

[22] The first group represents people with relative income poverty (less than 60 percent of median income). The second and third groups comprise people below the median income (60 to less than 80 percent and 80 to less than 100 percent of the median, respectively). The upper half of the income hierarchy is divided into four groups (100 to less than 120 percent, 120 to less than 150 percent, 150 to less than 200 percent, and 200 percent or more of the median). Changes in relative income position within the time period observed are disregarded here, i.e., only the income positions of the first and last years are compared.

[23] This corresponds to 4.8 percent of the total population.

[24] This index focuses on the concentration relative to the principle diagonal and indicates the share of people changing their income group over time. See A. Shorrocks, "Income Inequality and Income Mobility," *Journal of Economic Theory* 19 (1978): 376-393. One disadvantage of this measure of mobility is that it measures only mobility between income groups, not mobility within the various income groups. For a general introduction to the measurement of (income) mobility, see G. S. Fields, "Does income mobility equalize longer-term incomes? New measures of an old concept," *Journal of Economic Inequality* 8 (2010): 409–427.

[25] This index considers the correlation of the difference in logarithmized incomes. See P. E. Hart, "The Statics and Dynamics of income Distributions: A Survey," in: N. A. Klevmarken and J. A. Lybeck, eds., *The Statics and Dynamics of Income*. Tieto, Clevedon. 1981 108-125.

then, income mobility has remained low. It has declined considerably in eastern Germany in particular.[26] There are also marked differences in income mobility between men and women.[27] The finding of declining income mobility is confirmed both when studying a larger number of income classes and when taking other measures of mobility into account.[28] There has been very little research into its causes and mechanisms to date, merely indications that increasing (wage) inequality is associated with the trend toward lower (wage) mobility.[29]

Conclusion

Inequality of disposable household incomes remains at a high level overall. Although the latest results from DIW Berlin based on data from the Socio-Economic Panel Study (SOEP) show declining income inequality from 2006 to 2010, triggered above all by declining unemployment, the positive trend in the development of income inequality did not continue in 2011.

Following a long phase of upward movement, the risk of poverty has not increased further since 2009. From a social-policy perspective, the development of income mobility is important, above and beyond simply observing the at-risk-of-poverty rate, which was approximately 14 percent in 2011, slightly lower than its peak of 15 percent in 2009. Income mobility has declined since German reunification, meaning that individual movements to higher or lower income groups are taking place less and less frequently. In particular at the margins of the income hierarchy, in the very low and very high income groups, there is a pronounced tendency to remain in the same group. The odds of exiting from poverty risk and thus of an income of less than 60 percent of median income within a four-year period have dropped to less than 50 percent in recent years. At the same time, the share of people below the at-risk-of-poverty threshold has increased; thus, more people in absolute numbers remain at risk of poverty.

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[26] See R. Riphahn and D. Schnitzlein, "Wage Mobility in East and West Germany," IZA DP No. 6246, 2011.

[27] See B. Aretz, "Gender differences in German wage mobility," ZEW Discussion paper, 2013-003, Mannheim, 2013.

[28] This is the case, for example, when using the Shorrocks measure, see A. Shorrocks (1978), "Income Inequality and Income Mobility," as well as the average jump measure, see A. B. Atkinson, F. Bourguignon, C. Morrisson, eds., Empirical studies of earnings mobility. Chur (CH): Harwood Academic Publishers GmbH, 1992.

[29] See M. Buchinsky, J. Hunt, "Wage Mobility in the United States." *Review of Economics and Statistics* 81 (1999): 351-368.

Appendix

Definitions, Methods, and Assumptions for Measuring Income

The analyses presented in this report are based on data from the longitudinal household survey, Socio-Economic Panel Study (SOEP) and primarily founded on annual incomes. In the survey year (*t*), all the income components affecting a surveyed household as a whole, and all the individual gross incomes of the current members of the surveyed household are added together (market income from the sum of capital income and earned income, including private transfer payments and private pensions), all of these referring to the previous calendar year (*t-1*). In addition, income from statutory pensions as well as social transfer payments (income support, housing assistance, child benefits, unemployment benefits, and others) are taken into account, and finally, annual net incomes are calculated employing a simulation of taxes and social security contributions—including one-off special payments such as a 13th or 14th month's salary for a given year, a Christmas bonus, and a vacation bonus. The calculation of the annual burden of income taxes and social security contributions is based on a micro-simulation model[30] which generates a tax assessment incorporating all types of income in accordance with the Income Tax Act as well as tax exemptions, income-related expenses, and extraordinary expenses. Since this model cannot simulate all the complexity of German tax law because of its numerous special provisions, income inequality measured in the SOEP is assumed to be an underestimate.

Following the international literature,[31] fictitious (net) income components from owner-occupied housing (imputed rent) are added to income. In addition, non-monetary income components from subsidized rental housing (government-subsidized housing, housing with rents reduced by private owners or employers, households that do not pay rent) are taken into account in the following—as required by the EU Commission for EU-wide income distribution calculations based on EU-SILC as well.

The income situations of households of different sizes and compositions are made comparable by converting a household's entire income into equivalent incomes (per capita incomes modified according to needs) in accordance with international standards.

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[30] See J. Schwarze, "Simulating German income and social security tax payments using the GSOEP. Cross-national studies in aging," Program project paper no. 19, (Syracuse University, USA, 1995).

[31] See J. R. Frick, J. Goebel, and M. M. Grabka, "Assessing the distributional impact of "imputed rent" and "non-cash employee income" in micro-data," in European Communities, ed.. *Comparative EU statistics on Income and Living Conditions: Issues and Challenges.* Proceedings of the EU-SILC conference, Helsinki, November 6-8, 2006, EUROSTAT 2006: 116–142.

Household incomes are thereby converted employing a scale proposed by the Organisation for Economic Co-operation and Development (OECD) and generally accepted in Europe. The calculated equivalent income is allocated to each household member on the assumption that all household members benefit from the joint income equally. The head of household is given a needs weighting of 1; additional adults each have a weighting of 0.5, and children up to 14 years of age weightings of 0.3.[32] In other words, cost degression is assumed in larger households. That means, for example, that household income for a four-person household (parents, a 16-year-old, and a 13-year-old) is not divided by four as is the case in a per-capita calculation (*=1+1+1+1*), but by 2.3 (*=1+0.5+0.5+0.3*).

In all population surveys, a particular challenge is how to take missing values for individual people surveyed into account appropriately, in particular concerning questions considered sensitive, such as those about income. The incidence of missing values is often selective, with households with incomes far above or below the average refusing to respond.

In the SOEP data analyzed here, missing values are replaced using an elaborate imputation procedure that is both cross-sectional and longitudinal.[33] This also applies to missing values for individual household members refusing to answer any questions in households otherwise willing to participate in the survey. In these cases, a multi-stage statistical procedure is applied to six individual gross income components (earned income, pensions and transfer payments in case of unemployment, vocational training/tertiary-level study, maternity benefits/child-raising allowance/parental leave benefits, and private transfer payments).[34] For each new data collection, all missing values are always imputed again retrospectively, which can result in changes compared with earlier evaluations. As a rule, however, these changes are minor.

In order to avoid methods-based effects in the time series of calculated indicators, the first survey wave of the individual SOEP samples was excluded from the calculations. Studies show that there are more changes in response behavior which cannot be attributed to differences in willingness to participate in the survey.[35]

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[32] See B. Buhmann, L. Rainwater, G. Schmaus, and T. Smeeding, "Equivalence Scales, Well-being, Inepuality and Poverty," *Review of Income and Wealth* 34 (1998): 115–142.

[33] J. R. Frick and M. M., Grabka, "Item Non-response on Income Questions in Panel Surveys: Incidence, Imputation and the Impact on Inequality and Mobility," *Allgemeines Statistisches Archiv* 89, no. 1 (2005): 49–61.

[34] J. R. Frick, M. M. Grabka, and O. Groh-Samberg, "Dealing with incomplete household panel data in inequality research," *Sociological Methods and Research* 41, no. 1 (2012): 89–123.

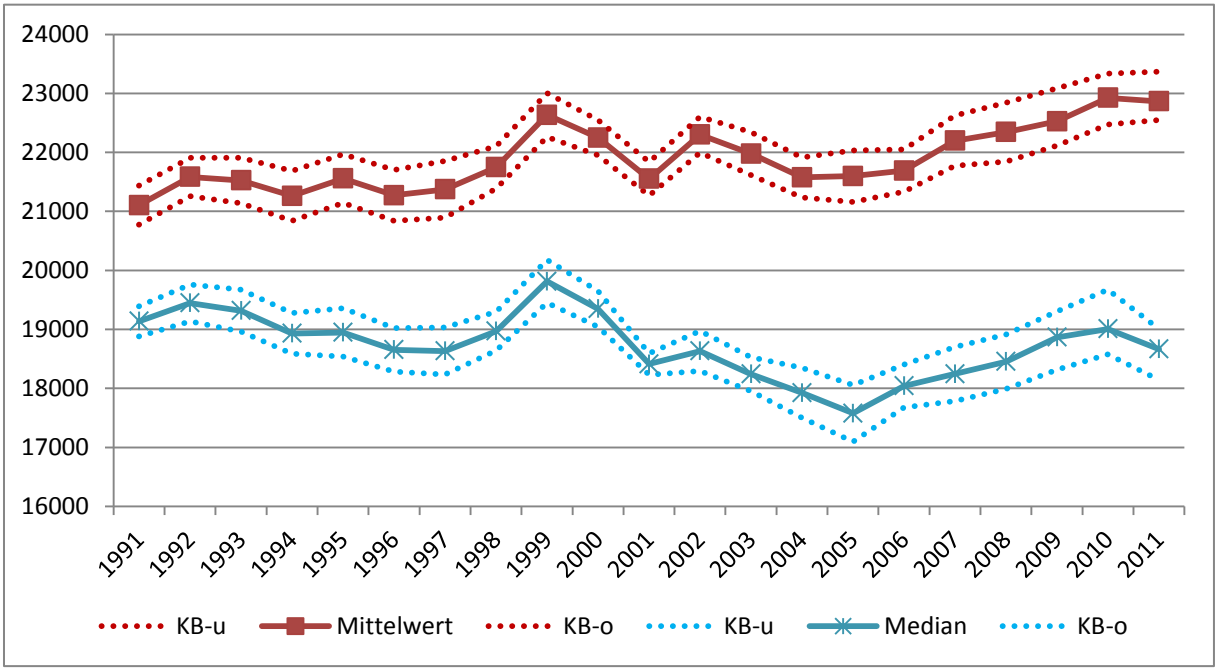
[35] J. R. Frick, J. Goebel, E. Schechtman, G. G., Wagner, and S. Yitzhaki, "Using Analysis of Gini (ANOGI) for Detecting Whether Two Subsamples Represent the Same Universe. The German Socio-Economic Panel Study (SOEP) Experience," *Sociological Methods Research* 34, no. 4 (2006): 427-468.

After taking weighting factors into account, the SOEP microdata on which these analyses are based (version v29 on the basis of the 29th survey wave in 2012) show a representative picture of the population in households and thus permit inferences about the entire population. The weighting factors allow for differences in the sampling designs of the various SOEP samples as well as in the respondents' participation behavior. Populations living in institutions (for example in retirement homes) are generally not taken into account. Besides updates in the context of adjusted imputation of missing values for income in the previous year, a targeted revision of weighting factors was carried out. In order to increase compatibility with official statistics, these factors are adjusted to currently available framework data from the official microcensus. Subsample J (first surveyed in 2011) of data version SOEPv29 was adjusted to the microcensus[36] in terms of the number of households receiving means-tested unemployment benefit. In addition, for all new samples since 1998, there was a change in the adjustments made to the data for households with non-German household members, which no longer involved only the head of household, but all household members. For the income years 1999 to 2010, this revision had only minor effects on measured income inequality and the at-risk-of-poverty rate (see figure). The differences in the results are not statistically significant; in other words, they are within the margin of statistical random error which would need to be taken into account in any case when interpreting the findings.

[36] The microcensus is also a sample survey which is extrapolated using benchmark data from the official statistics. Since the recently published census results show that the previous forward projection of population figures provides insufficient results due to the long gap in between censuses, the extrapolation scheme will have to be revised. Above all, a lower figure will have to be used for total population. Extrapolation of SOEP data will then have to be adjusted accordingly as well.

Figure 1

Market Income in Real Terms[1]
In thousands of euros per annum

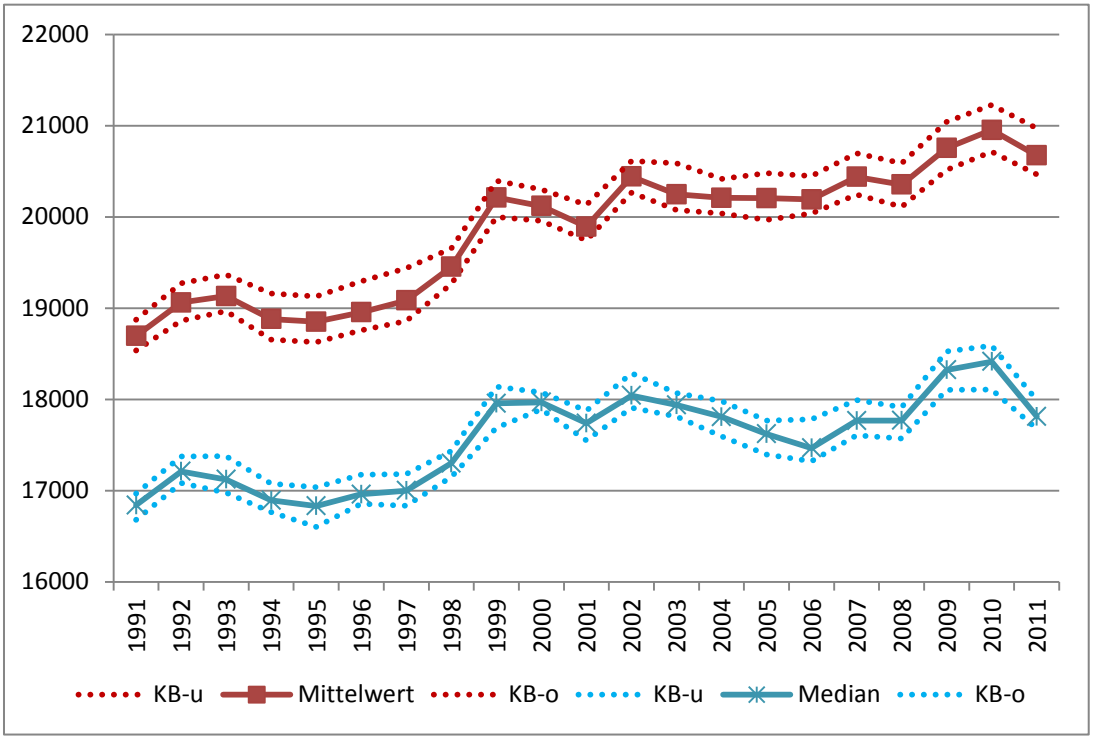


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, market income including a fictitious employer's contribution for civil servants, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Source: SOEP v29, calculations by DIW Berlin.

Figure 2

Disposable Income in Real Terms[1]
In thousands of euros per annum

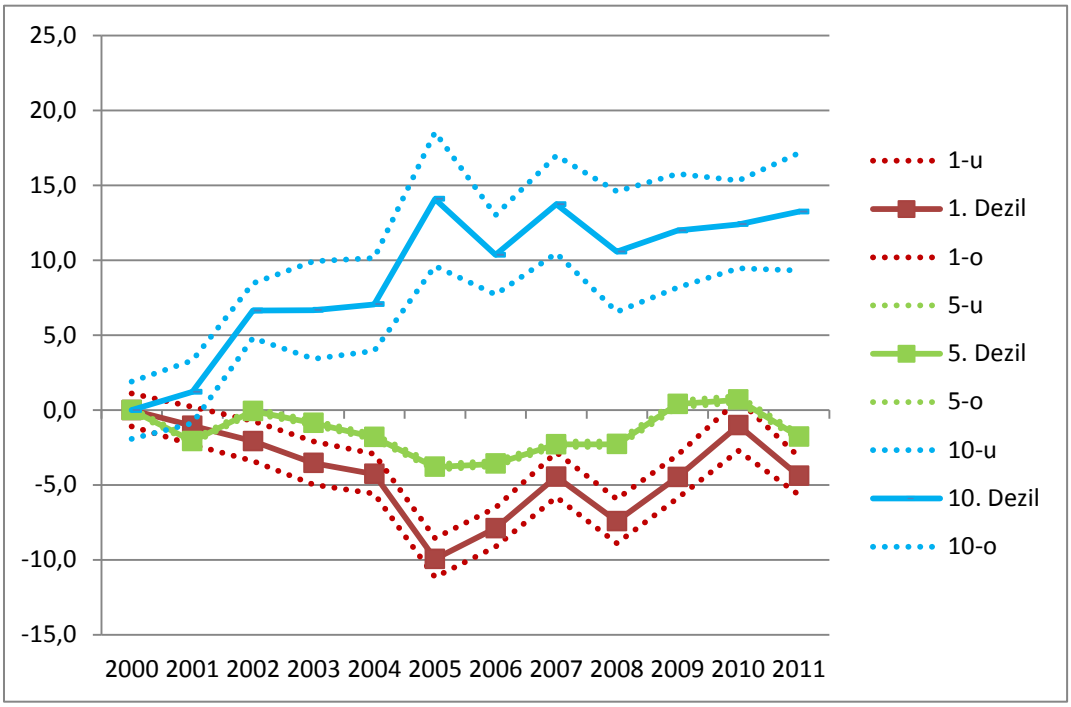


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Sources: SOEP v29, calculations by DIW Berlin.

Figure 3

Disposable Income[1] in Selected Deciles
Changes in mean values compared to 2000
in percent

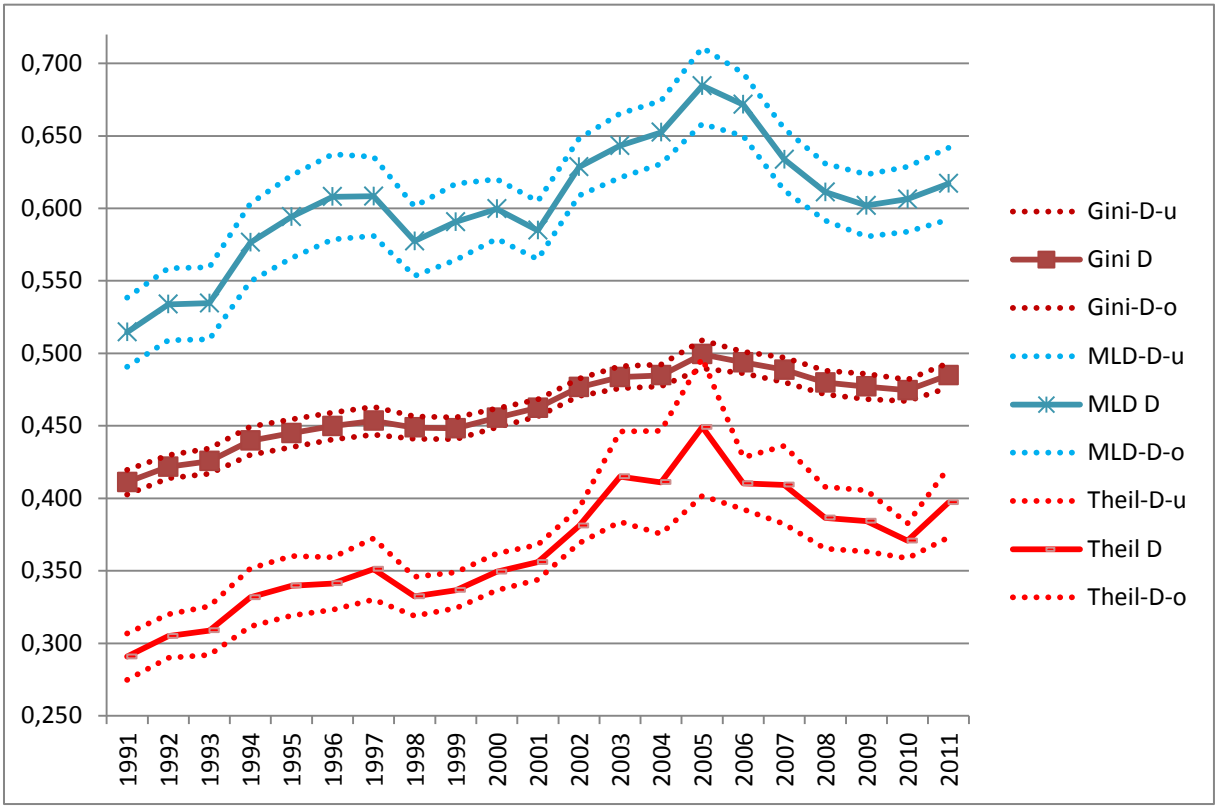


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Sources: SOEP v29, calculations by DIW Berlin.

Figure 4

Inequality of Market Incomes[1]
Coefficients[2]

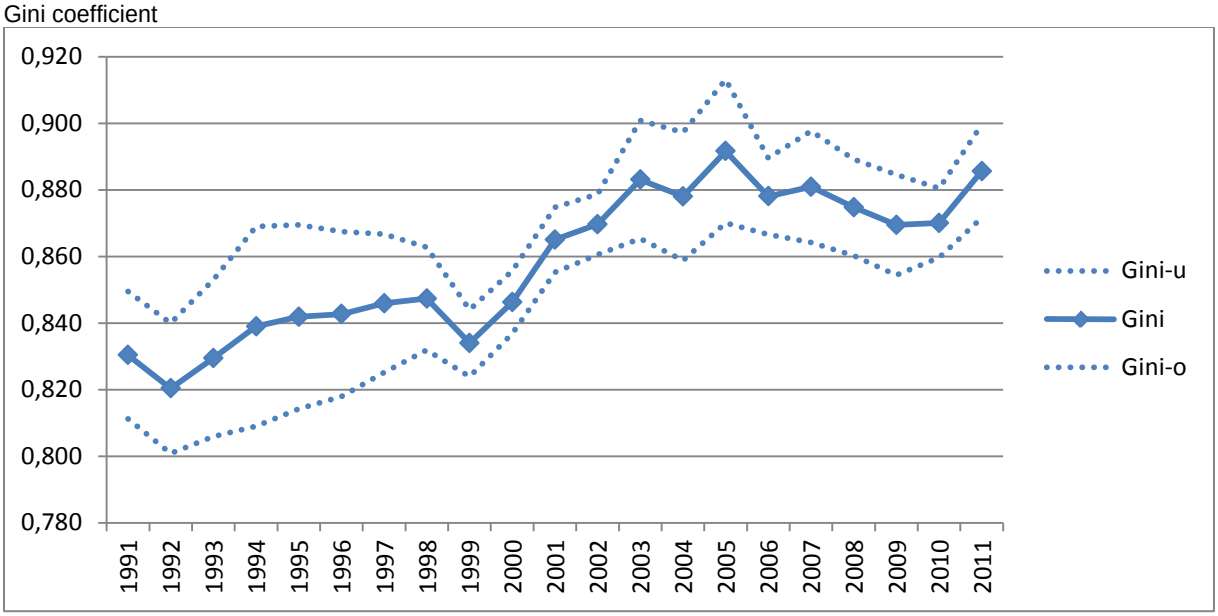


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, market income including a fictitious employer's contribution for civil servants, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region
2 The measures of inequality used here were the Gini coefficient, the mean log deviation (MLD), and the Theil index. Cases with zero income were excluded when calculating the MLD and the Theil coefficient.

Sources: SOEP v29, calculations by DIW Berlin.

Figure 5

Inequality of Capital Incomes[1]
Gini coefficient

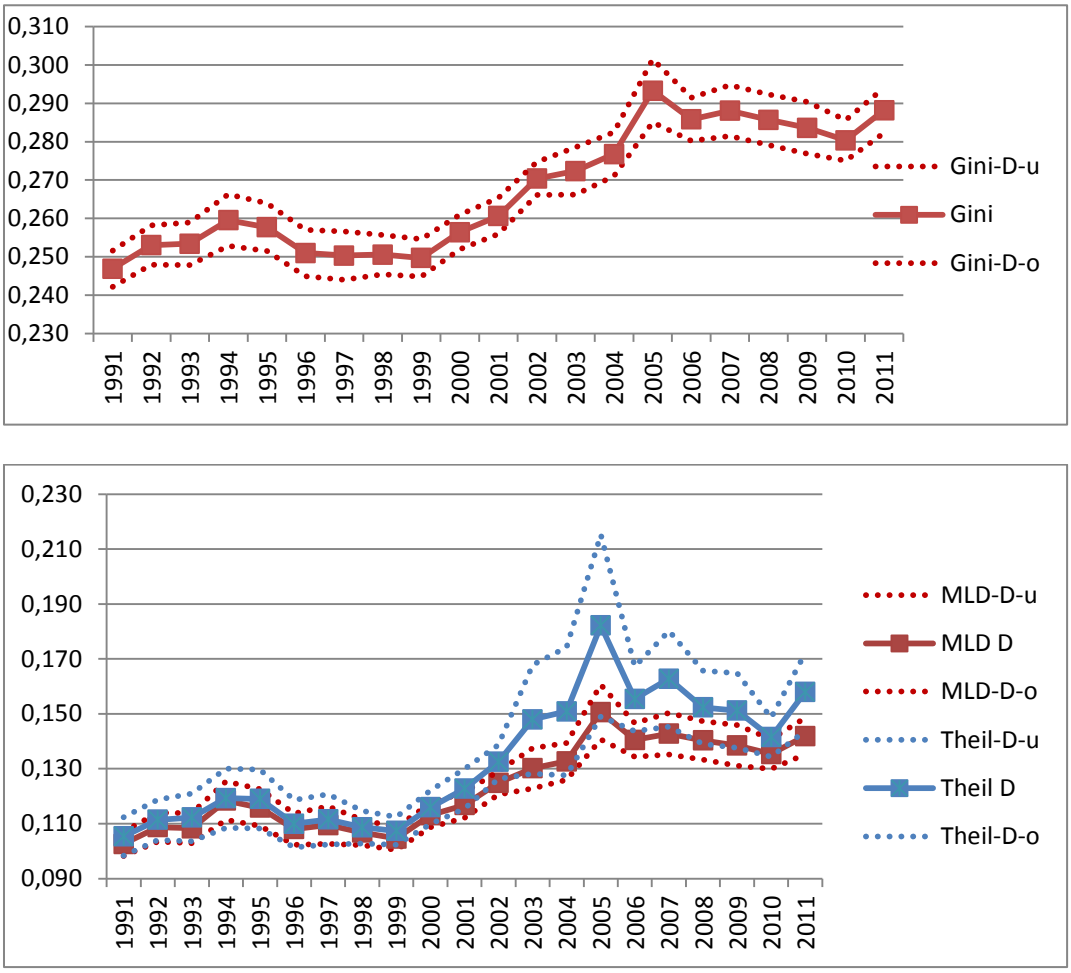


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Sources: SOEP v29, calculations by DIW Berlin.

Figure 6

Inequality of Disposable Incomes[1]
Gini, MLD and Theil Coefficients[2]

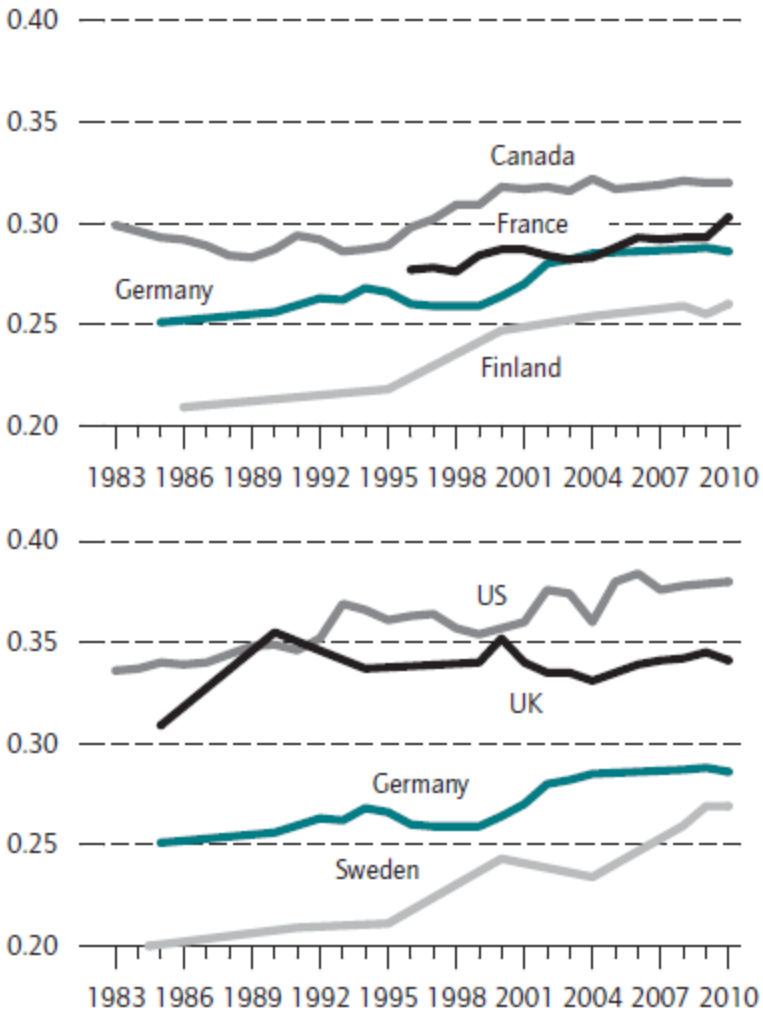


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region
2 The measures of inequality used here were the Gini coefficient, the mean log deviation (MLD), and the Theil index. Cases with zero income were excluded when calculating the MLD and the Theil coefficient.

Sources: SOEP v29, calculations by DIW Berlin.

Figure 7

Inequality of Disposable Incomes in Selected OECD Countries
Gini coefficients

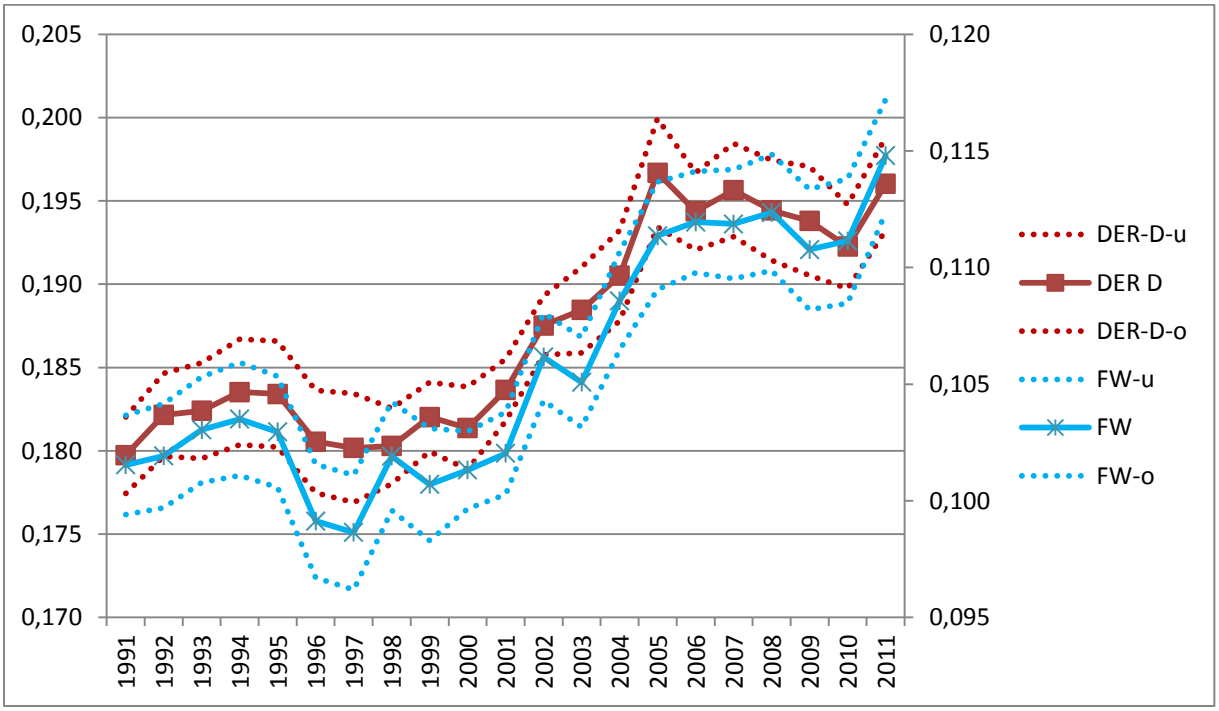


Source: OECD.

Figure 8

Indices of Polarization of Disposable Incomes[1]

Duclos-Esteban-Ray index and Foster-Wolfson index

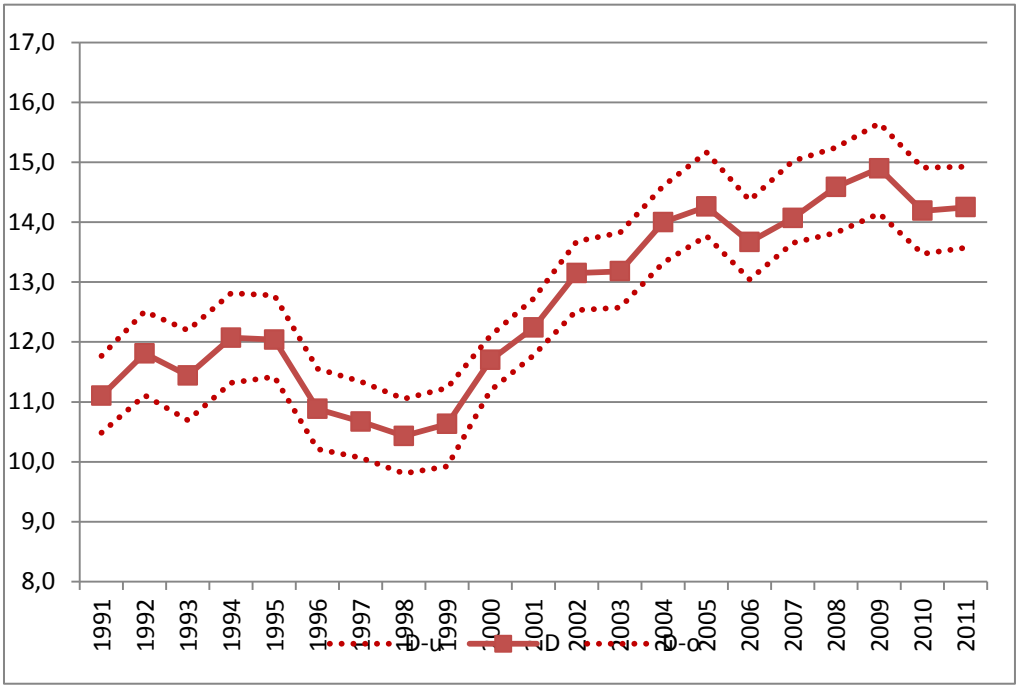


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Sources: SOEP v29, calculations by DIW Berlin.

Figure 9

At-Risk-of-Poverty Rate[1]
In percent

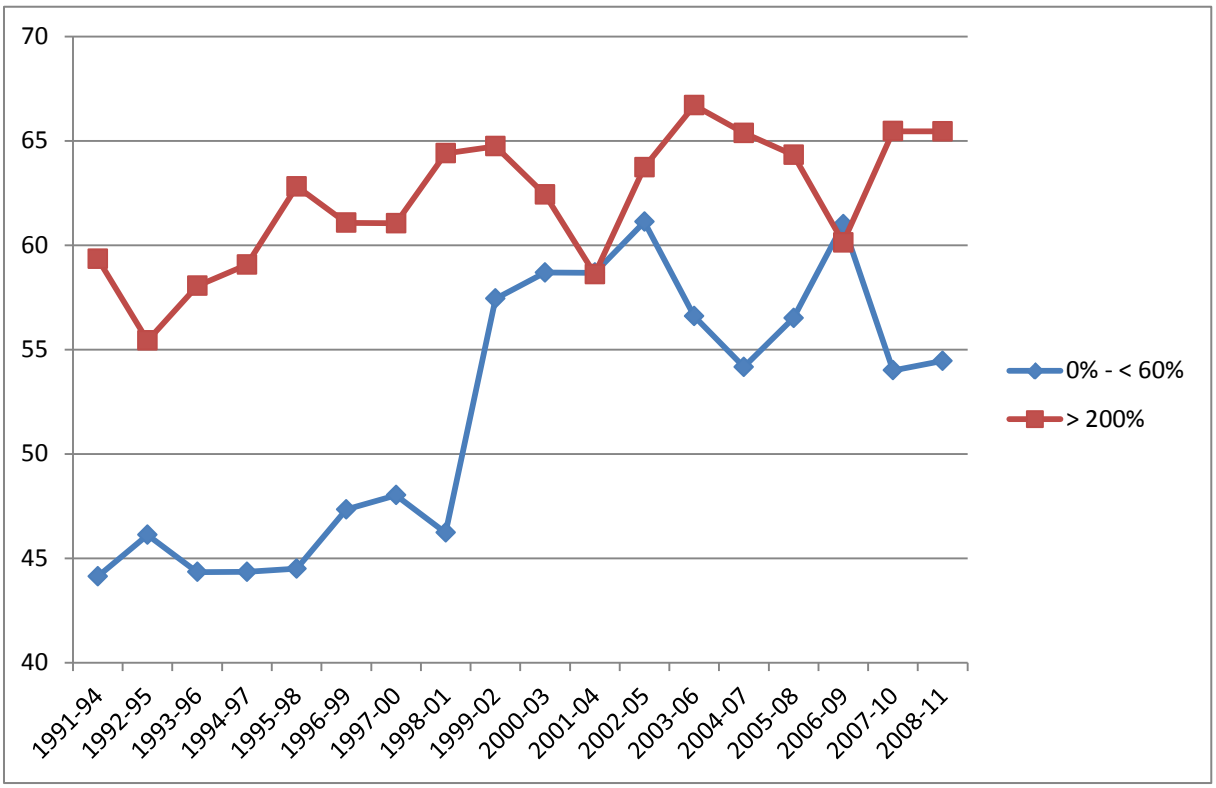


1 Individuals with less than 60 percent of median income are at risk of poverty. Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Source: SOEP v29, calculations by DIW Berlin.

Figure 10

Individuals Remaining In Their Income Groups[1]
Shares in percent (over/below the median)

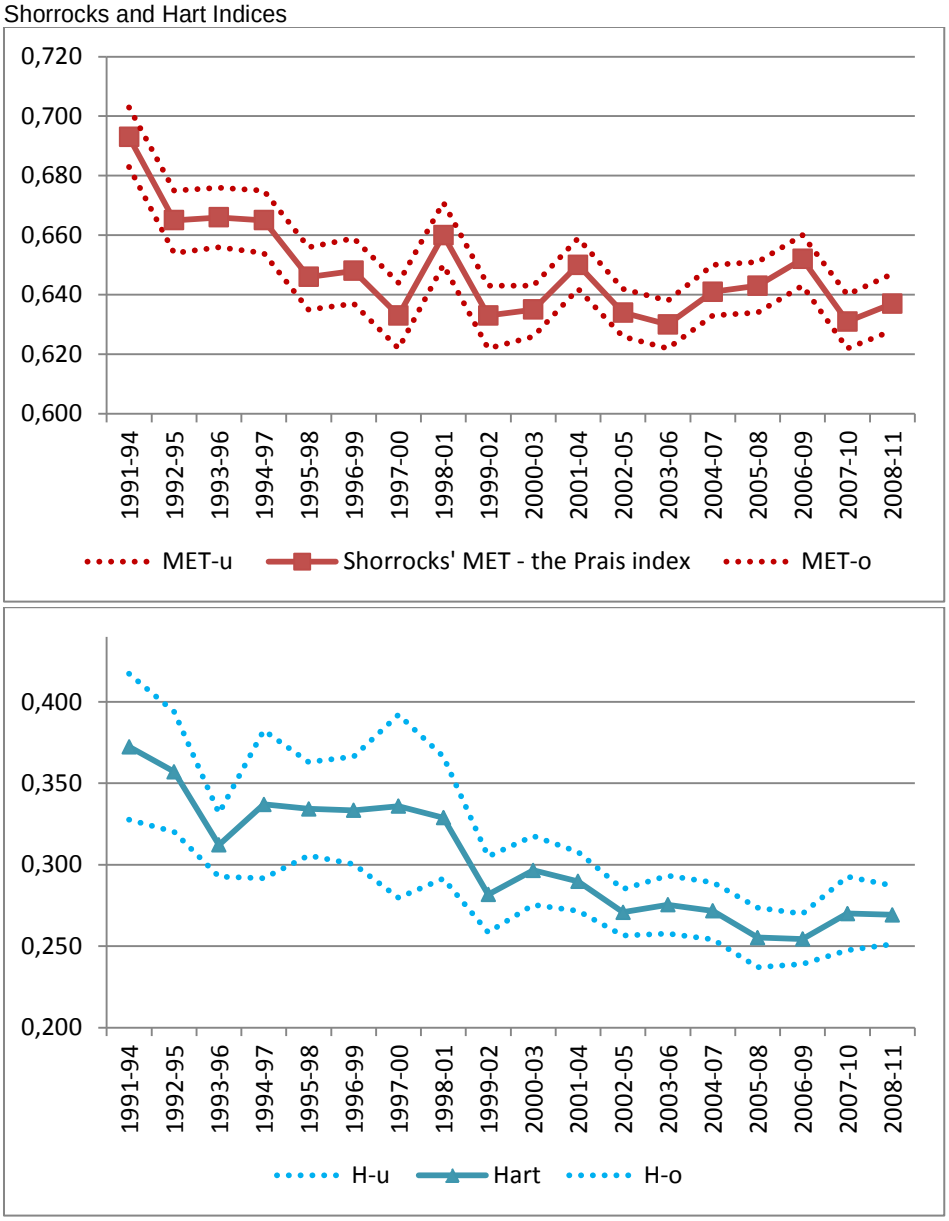


1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Sources: SOEP v29, calculations by DIW Berlin.

Figure 11

Income Mobility[1]
Shorrocks and Hart Indices



1 Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale. Gray area = 95-percent confidence region

Sources: SOEP v29, calculations by DIW Berlin.

Table

Income Mobility[1]
In percent of the median

Relative income position in the initial year	Relative income position in the final year							Population in percent
	0– <60	60– <80	80– <100	100– <120	120– <150	150– <200	≥ 200	
1994–1997								
0– < 60	44	32	12	4	5	2	0	12.1
60– < 80	15	40	30	11	2	1	0	17.8
80– < 100	5	18	42	24	8	3	1	20.1
100– < 120	3	6	26	35	21	7	2	16.6
120– < 150	2	3	12	22	39	19	4	15.8
150– < 200	2	2	7	8	27	42	12	11.0
≥ 200	1	2	2	4	7	26	59	6.6
1998–2001								
0– < 60	46	31	12	6	3	2	0	10.4
60– < 80	16	40	28	9	4	2	1	18.4
80– < 100	5	19	39	22	11	4	1	21.2
100– < 120	3	5	20	34	26	9	2	16.0
120– < 150	3	5	9	17	38	23	5	16.1
150– < 200	2	2	3	8	24	43	19	11.7
≥ 200	1	1	1	3	7	23	64	6.2
2004–2007								
0– < 60	54	26	12	4	3	1	0	14.0
60– < 80	21	46	23	5	4	1	0	16.6
80– < 100	9	25	33	21	10	2	0	19.5
100– < 120	3	8	27	36	20	6	1	16.3
120– < 150	2	4	10	23	40	17	3	15.5
150– < 200	2	1	5	8	24	41	19	11.0
≥ 200	1	1	2	2	9	20	65	7.3
2008–2011								
0– < 60	54	29	8	5	1	2	0	14.5
60– < 80	16	41	31	8	4	1	0	16.8
80– < 100	6	19	42	21	9	2	1	18.6
100– < 120	5	8	24	33	23	7	1	15.7
120– < 150	3	2	7	21	42	22	3	15.2
150– < 200	1	1	5	8	24	40	21	11.3
≥ 200	1	1	3	2	7	20	65	7.8

1 Relative income positions based on the median of needs-weighted net household incomes of the total population. Incomes of individuals in households at 2005 prices. Surveyed the following year, needs-weighted using the modified OECD equivalence scale.

Sources: SOEP v29, calculations by DIW Berlin.