Karlsruhe Institute of Technology

The rise of the working rich
The case of unified Germany

Von Andreas Haupt und Gerd Nollmann

Nr.5 | September 2017

WORKING PAPER SERIES IN SOCIOLOGY

Impressum

Karlsruher Institut für Technologie (KIT)
Institut für Soziologie, Medien- und Kulturwissenschaften (ISMK)
Schloßbezirk 12
76137 Karlsruhe

Working Paper Series in Sociology

No.5 | September 2017

www.soziologie.kit.edu/WorkingPaperSeriesInSociology.php

ISSN: 2363-8079

The rise of the working rich
The case of Unified Germany

Recent decades have witnessed some extraordinary increases of income richness in some countries. Even though many consider Germany to be different, recent research has found a strong increase of rich income households in Germany, as well. However, Germany's data infrastructure on rich households is comparatively weak so that little is known on the causes of higher richness headcounts. This article discusses research and possible causes of the recent increase of household richness using a decomposition of unconditional quantile regressions and data from the German Socio-economic Panel (GSOEP). Comparing most recent data and the early 1990s after reunification, the most striking result is that the upper half of the German income distribution has dispersed due to unfavorable changes in payroll taxes in combination with increased wage inequality. We conclude that during the past 30 years, Germany has promoted the rise of the working rich politically.

JEL: Income Inequality, Richness, Taxation, Decomposition

1. New income richness

Recent decades have witnessed extraordinary increases of income richness in some modern countries (OECD 2011). French economist Thomas Piketty (Piketty 2014) characterized this trend as a "return of capital". However, Piketty's analyses of tax data not only refer to a comeback of "capital" as an important factor of income inequality but also to top labor market earnings. According to his data, the share of wage earnings in the top decile of all incomes has risen from approximately 30% to over 45% in countries like the United States and thus to a level that was last reached in the 1920s (Atkinson, Piketty, and Saez 2011). Piketty (Piketty 2014) views increased executive negotiation power as a cause of rising income richness. Furthermore, lower tax rates have fueled executive bonus pay schemes. Finally, as the revenues of capital like interest, dividends, saving, and business profit assets tend to grow faster than average incomes, Piketty (2014) sees many countries on their way back to patrimonial capitalism, in which a small number of households melds a large and growing part of all incomes passed on within the family.

Germany, together with countries like Switzerland, France, and the Netherlands, is explicitly regarded an exception from this strong new trend with moderate increases in the top area (Atkinson, Piketty, and Saez 2011). Still, recent research has found not only more high income households in Germany (Arndt et al. 2011, 234; Bach, Corneo, and Steiner 2013; Alvaredo et al. 2012; BMAS 2014), but also an *absolute* divergent development of high, medium, and low incomes (Goebel, Gornig, and Häußermann 2010). In Germany, a household is officially

considered income rich if it obtains an income twice as high as a household that is located exactly in the middle of the income distribution. Following this definition, the rate of rich households increased from 6.2% in the 1990s to about 8% today, which relates to an increase of one million rich households in Germany. In addition to a higher number of income rich households, a growing distance between extremely rich households and the rest has been documented in recent years (Drechsel-Grau, Peichl, and Schmid 2015; Bach, Corneo, and Steiner 2013, Bach, Corneo, and Steiner 2009).

A higher percentage of rich households mirrors a changed shape of the entire income distribution: the number of rich households will increase if more households move to the top income segment without households in the middle following suit. A growing dispersion within the upper parts of the distribution is based on the same process. The upper tail of the income distribution shifts away from the rest, increasing the difference between household incomes for the extremely rich and the rest. We will therefore analyze the upswing of the new income richness between the early 1990s and 2015 in Germany using distributional methods in this paper.

Doing so, we can study which processes have contributed how much at different points of the income distribution, leading to an increase of income richness. Our main goal is to single out the major drivers behind the growing dispersion of the upper half of the German income distribution. It may be due to increased labor earnings, capital incomes, or possibly even pensions. Even though countries might have suppressed increases in income inequality stemming from such forces using appropriate tax reforms, it seems that many countries have tended to decrease taxes for the high incomes, leading to an acceleration of inequality growth in recent decades (Neckerman and Torche 2007). Looking at the German case, we show that the architecture of the German tax system, especially the payroll tax system, has contributed strongly to increased income richness. This way, our analyses add new insights to recent debates about income richness. So far, payroll taxes have played a minor role in debates about increased inequality, despite discussions a decade ago that “the working rich have replaced the rentiers at the top of the income distribution” (Piketty and Saez 2003, 1). Instead of payroll taxes, it was rather income taxation that has gained scholarly attention after governments, like the Bush administration, had granted rich households huge tax cuts.

However, the possible contribution of payroll taxes to richness is subtle. If the working rich have increased labor incomes much more over time than the rest of the population, payroll taxes might have been a key to reduce income inequality for countries. Instead, we demonstrate how

the German payroll tax system has transmitted higher wage inequality into more household income inequality. Germany may indeed be an exceptional case in international comparison, with capital incomes playing a seemingly smaller role compared to advantages for high wage earners granted by the payroll tax system. The new income richness in Germany can thus be interpreted as a result of the concentration of high wages on high-income households which is fueled additionally by the architecture of payroll taxes. It is in large part a politically driven rise of the working rich.

In this paper, we focus exclusively on the rise of income inequality in the top half of household incomes. We exclude the question of intergenerational transmission of richness as well as the distribution of wealth. The latter, we will consider only insofar as it adds capital income to current income.

2. Extent and Development of Income Richness in Germany

Even though the number of studies on income richness in Germany is relatively small, they all give one message. Regardless of whether they use households or headcounts, focus on income or include wealth – income richness has increased in Germany since the 1990s. Considering 200% of the median of disposable household income as the relevant benchmark, the 4th report on poverty and richness of the German Federal Government finds a rise of the richness headcount from 6.2% to 7.6% (*GSOEP* data) or to 8,1% in 2011 (data from the *Income and Consumption Survey*, BMAS 2014, 464). These rates represent about 3,5 million rich households and more than one million *new* rich households. Peichl et al. (2012) calculate a rise of the headcount rate from 5.8% to 8.7% between 1983 and 2006. These estimates take a small leap at the beginning of the 1990s due to the persistent East-West wealth gap after reunification.

Some studies analyze, whether there is systematic acceleration of income growth within the rich population (Bartels and C. Schröder 2016; Dell 2007; Jenderny 2015b; Bartels and Jenderny 2015; Bach, Corneo, and Steiner 2009). Using data from the World Income Database, figure 1 shows the clear confirmation these studies give. Average pre-tax fiscal incomes of the top 10% of all households increased by about 1881 Euro per year from 100.000 Euro in 1992 to about 135.000 Euro in 2011. Households in the top 1% increased their average fiscal income by about 8600 Euro per year from 324.000 Euro in 1992 to 452.000 Euro in 2011. According to Dell's (2007) estimation, this dispersion appears even *within* the top 1%. The total household income threshold of the top 1% moved from 242.000 Euro in 1991 to 300.000 Euro in 1998. For the top 0.1% it moved from 968.000 Euro to 1.380.000 Euro in the same period.

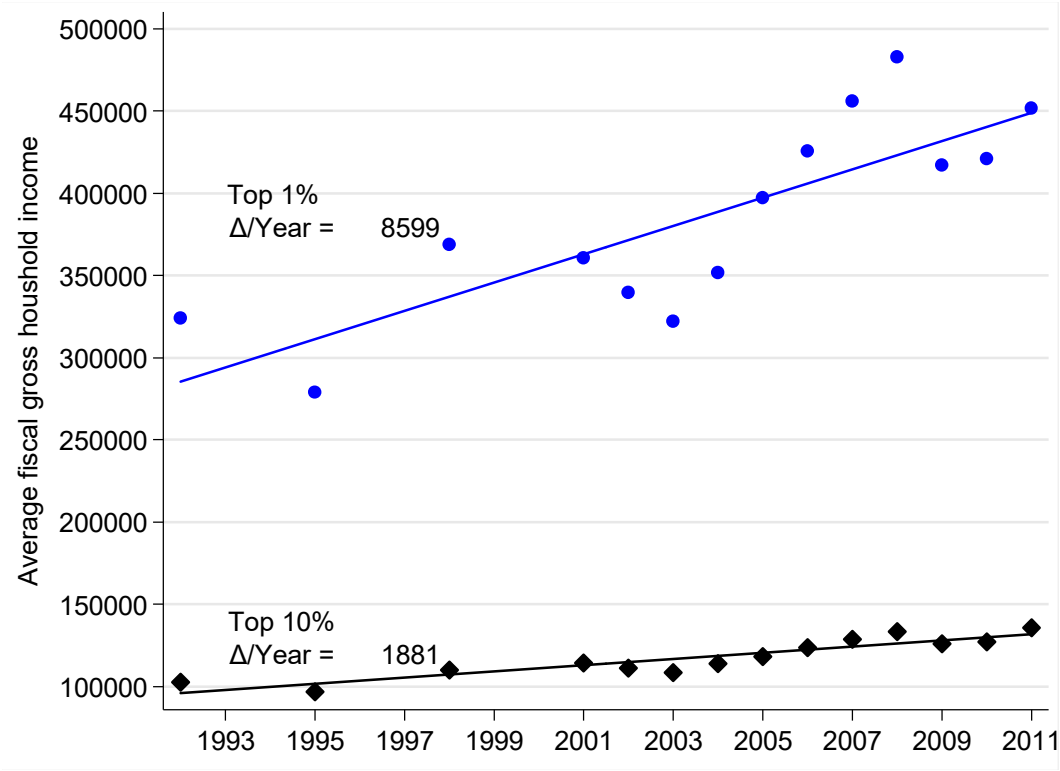

Figure 1: Average gross fiscal household income for the top 10% and top 1% of all households in Germany between 1992 and 2011. Source: World Income Database. Own Calculation.

Therefore, available data unanimously point out that the upper tail of the income distribution has shifted away from the rest of the distribution since the 1990s which has created more rich households as this shift did not just happen within the super-rich households. We thus need to answer why the upper tail of the disposable income distribution has dispersed that much over time.

3. Explaining increased richness

In this article, we study changes in the distribution of *disposable household incomes*. Income richness allows households to spend significantly more money than average households. Since disposable income is the post-tax total income per equivalent full household member, it follows that the distribution of disposable income can change due to three major sources. 1) The pre-tax incomes of households become more unequal. 2) The tax burden becomes more unequal. 3) The composition of household's changes. For example, high-income households might share incomes with less heads. Decomposing household incomes into these three possible sources of change, we can study whether income richness has increased because either incomes, taxes, or household composition have changed asymmetrically across the top half of the distribution. We will review the literature according to these possible sources in the next section.

3.1 Contributions of income sources

Households earn incomes from two major sources: labor income on the one hand and capital income on the other hand. The latter includes incomes from renting, leasing, rents, interest, and dividends. As capital incomes or incomes from self-employment make up the *main* income source only for a small part of German households (Bach, Corneo, and Steiner 2013), the recent increase of wage inequality might have been the most important factor in increased richness. In this line, Arndt et al. (2011) attribute most of the rise in household inequality to the polarization of wage earnings. Goebel, Gornig, and Häußermann (2010) further strengthen that view showing that the development of income inequality strongly relates to the business cycle: During economic upswings, it decreases while it grows in recessions.

If wage earnings are indeed the major driver of more household richness, it will be prudent to consider sources of wage inequality as a mediate agent of household inequality. In a more recent state of the art review, Fitzenberger (2012) sees most of the increase of wage inequality in strong growth of top wages. A few studies have attributed *very* high wage earnings either to alleged exceptional talents (Kaplan and Rauh 2013) or to market failure and economic rents (Weeden and Grusky 2014). Researchers agree that very high wages can hardly be interpreted as returns to education. Rather, very specific high wage positions on the labor market merely correlate with classical features of human capital. Some studies on household demographics support this assumption. Within rich households, middle-aged persons prevail (Spannagel 2013). Among the rich, we find both business owners and highly qualified employees or senior officials (Arndt et al. 2011, 218). Schupp et al. (2003) show that those persons typically claim high working hours indicating that work plays an important role for the rich. However, these findings should not lead to the conclusion that these groups have been promoted to richness *without exception*. Rather, earnings have polarized within these groups, as well (Lemieux 2010).

Much more, a polarization of earnings does not inevitably result in higher income richness. It might be neutralized by parallel changes in household composition or taxes. Simultaneously, more inequality might get reinforced by asymmetrical changes of capital incomes. However, recent research has stressed that a confrontation of "work versus capital" does not necessarily yield the most important insights into recent income richness. Instead of competing, high wages are rather associated with high capital income nowadays (Westermeier, Tiefensee, and Grabka 2016; Hansen 2014)

Nevertheless, Piketty (2014) has indicated a rapidly increasing importance of capital incomes for new income richness in a series of studies even though he considers Germany a comparatively moderate case. Yet, a few studies point to an important role of capital income for the increase of richness in Germany. According to Horn et al. (2014) "changes in the share and concentration of capital income have turned out to be a driving force for the development of income inequality in total, both in the first half of the 2000s and during the crisis at the end of the past decade" (Horn et al. 2014, 97).

Strong company profits constitute an important element of the increased importance of capital. Germany has achieved considerable GDP growth since reunification. Increased output was accompanied by a huge increase of company profits. National accounts state that dividends have doubled from €150 billion to €300 billion between 1992 and 2013 (while paid interest decreased from €125 billion to €50 billion). The fall in paid interest is explained by the fall of interest rates from over 11% during reunification to currently around 0%. In contrast, incomes from renting and leasing have risen strongly (Statistisches Bundesamt 2014) and have therefore contributed to higher household incomes. Finally, gifts and inheritances have tripled from 40 to 120 billion Euro since reunification (Corneo, Bönke, and Westermeier 2016). Schinke (2012) even estimated this number at 220 billion Euro.

However, a higher concentration of capital income within the upper tail of the household income distribution is required to actually increase richness. There are hardly any studies on changes of the distribution of capital incomes in recent decades. The *German Council of Economic Experts* (Sachverständigenrat 2014) sees no contribution of capital income to increases of income inequality between 2001 and 2011, neither in East nor West Germany. The shares of capital incomes in West Germany in 2001 in the top three deciles were 3.5%, 4.7%, and 11%. In 2011, these shares were 3.0%, 3.6% and 9.2% (Sachverständigenrat 2014, 375). Fräßdorf, Grabka, and Schwarze (2011) do not find an increased influence of capital income on household income inequality between 1984 and 2005. This result is supported by Grabka (2015) for the years 2007 to 2012.

Concerning other income sources, there are hardly any findings that might explain higher income richness. According to the *German Council of Experts* (2014), incomes from rent values of owner-occupied property, private transfers, and private pensions did not promote higher income inequality between 2001 to 2011. Even though inequality between owners of residential property and tenants has grown (Frick and Grabka 2003), it does not seem to be connected to crucial changes in the top income segment.

Furthermore, a possible relevance of inheritances for the latest *increase* of income inequality has not been laid out convincingly. While it is well known that due to low inter-generational mobility, children of high earning parents receive both high earnings themselves and high inheritances (Westermeier, Tiefensee, and Grabka 2016), there is no evidence that this correlation has increased in recent decades (Corneo, Bönke, and Westermeier 2016).

The literature on income sources as a driver of the dispersion in the upper half has two clear messages. First, wage inequality has increased strongly in recent decades. The literature suggests that the beneficiaries of higher wage inequality often stem from households with additional income sources. *However, if the increase of labor income itself is indeed the major driver of inequality, we should observe that household properties associated with high labor incomes should explain a large part of increased dispersion in the upper half of the income distribution.* Two of the most important properties seem to be the educational and the employment structure of these households. High education households with pronounced labor market integration should be those with large labor income increases. That is not to say that *all* households with these characteristics have been able to increase wage earnings. Nevertheless, we expect that educational status and labor market integration are key attributes of labor market positions that grant large wage increases.

The second message is: We do not know much about the role of other income sources. If they do play a role, capital income looks like a reasonable candidate for more richness due to the strong increase in dividends. Households in the top percentiles of the distribution might have gained as shareholders, thus participating stronger in the general upswing of the German economy than other households. *In this case, capital income should explain at least some part of the new dispersion in the upper half.*

Households with self-employed members should participate in increased revenues and/or profits of their companies. *If households with self-employed members in the upper parts of the distribution profit over time, this group should at least partly explain higher income richness.*

3.2 Taxes and the New Income Richness

Like in many other countries, income taxes are determined at the household level in Germany, while payroll taxes (social security contributions) rest strictly on individual wages. For income taxes, all incomes of a household are summed up. After deductible expenses, the household tax burden is assessed on a yearly basis. The German income tax is progressive. The marginal tax rate increases with incomes up to a defined maximum level of currently 42%. The rate is flat

above this point. However, the actual tax burden may be reduced by loopholes and tax refunds. Analyzing the *German Income and Consumption Survey* (EVS), the 4th report on poverty and richness of the German Federal Government (Arndt et al. 2011, 43) found that in the top half of the income distribution, tax refunds due to a wide body of exemptions are widespread and have increased in recent years. Overall, the share of taxable income has decreased in recent decades (Bach, Corneo, and Steiner 2013; Corneo 2005). For the period of 1995 to 2005, Bach, Corneo, and Steiner (2013) demonstrate an asymmetrical development of the *actual* tax burden: From the first to the fifth decile, the burden decreased from 10.7% to 7.5% as non-taxable public transfers now account for more incomes in lower income areas. Between the sixth and the ninth deciles, the tax burden has remained constant at 17.4% while it decreased slightly from 30.1% to 29.7% in the tenth decile. Top incomes, however, have enjoyed strong tax reliefs: For the top 1%, the burden decreased from 42.8% to 37.1%, for the top 0.01% from 47.9% to 38.3% and for the top 0.0001% from 49.4% on 38.3%. The authors attribute this reduction not only to tax reforms introduced by the Schröder Government but especially to newly established tax relief schemes after reunification that were meant to give incentives for investments in East Germany (Biewen and Juhasz 2012). There are no comparable results for the years after 2005. Since then, some tax loopholes have been closed and tax evasion has been prosecuted more openly. In 2009 a flat withholding tax on capital incomes was established. This new flat tax has decreased the burden on capital incomes so that households with high capital incomes may have gained in particular.

Despite these tax cuts, Schmid and Stein (2013) conclude that the influence of taxes on household inequality should not have changed too much in recent years. In a more recent study, Bach, Beznoska, and Steiner (2016a) find contradictory evidence. Changes of the tax system between 2005 and 2015 have increased the burden for households in the lower half of the distribution. However, the burden decreases strongly within the upper half and disappears for households in the tenth decile. The top 1% even witnessed a decrease of the burden by 1% and the top 0.1% of all households a decrease of 2%.

While we do not want to judge which side is right in this dispute over changes in German income taxation, we need to keep in mind that income taxes account for just 20% of the entire tax burden of private households (Bundesministerium der Finanzen 2011). In contrast, the share of social security contributions in total public revenues was at about 46%. So far, there have been almost no studies on the possible relevance of social security contributions for increased income richness. While social security contributions tend to increase steadily along the

household income distribution, their share of total household income reaches its highest level in the middle of the distribution, tops out in the 8th decile and then declines in the highest decile (Beimann et al. 2011). This curvilinear importance of social security taxes is explained both by the composition of income sources across the distribution and the particular German contribution scheme (Bach, Beznoska, and Steiner 2016b). Social security taxes are due on individual wage earnings only. Other income sources such as transfers, inheritances, capital incomes are not included in this tax liability. Thus, households in which wage earnings dominate over other income sources bear a relatively high burden.

Two other factors ultimately decide on the extent to which social security taxes reduce net household incomes: on the one hand, *contribution rates* of each individual social security scheme and, on the other hand, Germany's so called *contribution thresholds*. Contribution rates simply constitute the percentage of one's wage that must be paid to social security. In the 1990s, contribution rates were raised strongly. In addition, the new nursing care security was introduced in 1995. The total rate went up from 35.6% in 1990 to 42.1% in 1997. Since then, the overall rate has been declining – mostly due to lower unemployment insurance contributions. Its sum was 39.55% in 2015 and hence still above the level seen at German reunification. This fact alone shows that flat social security contributions have taken a different direction than progressive taxation which was cut back. It is worthwhile investigating if his difference proves to be relevant for the entire income distribution, as well.

The development of German social security income *thresholds* is even more striking. All social security contributions are assessed as a percentage of gross wages only up to predefined income thresholds. *Labor earnings above this threshold are not subject to social security contributions*. These cutoffs distinguish the German payroll system from many other countries. Therefore, individuals and households with high earnings profit from this rule – and they profit even more, the higher their earnings are.

Each year, the federal government defines contribution thresholds without much public noise. Due to the German budget crisis after reunification, the federal government increased the contribution thresholds much faster than average wages. On average, the thresholds for health and care insurances have grown about 665 € per year. Pension and unemployment insurance have separate thresholds in West and East Germany. In the West it has risen by 1265 € per year whereas average wages increased by just 806 € per year. Additionally, from 2002 to 2003 there was a giant leap from 54.000 € to 61.200 € in West Germany (cf. Figure 2). It appears quite likely that the strong growth of contribution thresholds has influenced the distribution of

household incomes asymmetrically. Earnings slightly above the threshold are caught up by the rise of the income thresholds when contributions grow strongly over time. In contrast, the growth of (very) high earnings mostly remains beyond the thresholds so that the *relative* social security burden may have increased only marginally. This peculiar architecture of social security contributions creates an advantage for households with high labor incomes, which accumulates over time and might have polarized disposable household incomes. A 1000 € wage gain translates differently into post-tax household gains dependent on whether the 1000 € gain is below or above the contribution threshold at the individual wage earner level. This advantage intertwines with household composition. As contribution thresholds focus on individual wages, households in the upper half of the income distribution with two or more earners will very likely pay more social security contributions compared to a top-up earner household *with a comparable pre-tax income*. This architecture of social security contributions sets incentives for families to have one top earner, generating labor income above the contribution thresholds, and one household member responsible for the reproductive household work with reduced labor market integration. Even though such a constellation may lead to the same post-tax household income as a full-time double earner couple with wages below or only slightly above the contribution thresholds, it will result in less social security contributions.

Furthermore, pay roll taxes are only relevant for labor incomes. Other income sources do not matter. Over time, households that rely more on capital incomes have a comparably lower tax burden compared to households with similar overall pre-tax income (mostly) from wages.

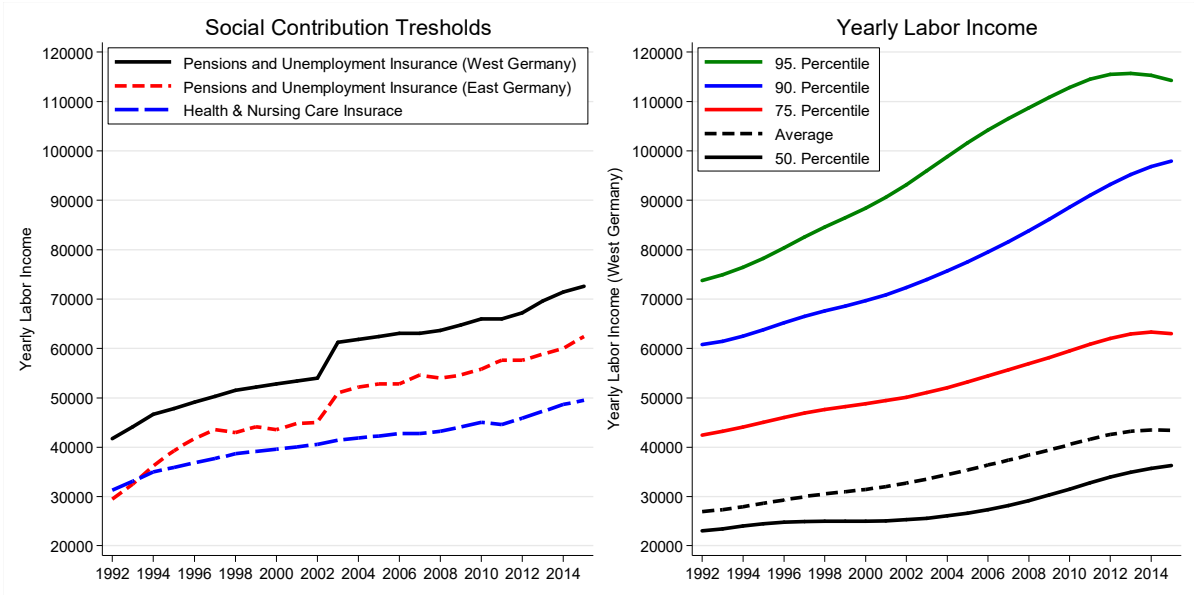

Figure 2: Social Contribution Tresholds (left) and Yearly Labor Incomes (right) for selected percentiles. Source for the right side: GSOEP V32. Own calculations. The order in the legends corresponds to the appearance of the values within the graphs.

In sum, the dual German tax system might therefore have been a decisive factor of increasing inequality in the upper half. The developments of direct taxation at the household may not be the crucial driving force of inequality. In stark contrast to individual flat social security taxes, the direct household tax burden should have grown progressively with higher incomes to some extent. The relative importance of tax reliefs (flat capital savings tax, cut of top tax rates), on the one hand, and a higher burden (abolishment of loopholes), on the other hand, cannot be judged easily at the household level from current research. *Overall, we expect that the strong income growth in the top segment should have increased the direct household tax burden, compressing the total household income distribution to some extent.* In contrast, the strong rise of social security thresholds in combination with the strong increase in labor incomes for households with already high household income should have led to asymmetrical impacts: households slightly above the middle are pulled more strongly towards the middle due to higher payroll tax burdens. *In higher regions of the household income distribution, the increase of social security burdens will fade out and reverse into a relative income advantage over time, intensifying more and more in top segments and therefore increasing dispersion across the upper half.*

3.3 Demographic Changes and the New Income Richness

Besides changes in the overall tax system, the demographics of private households or the situation of specific cohorts might have polarized the upper half of the income distribution.

Research has sometimes assumed that stronger educational homogamy has increased income inequality over time (Esping-Andersen 2007; Schwartz 2013). More persons with higher education form households together over time, accumulating a higher share of labor market positions. If labor market positions with already high wages do indeed pay better off over time, couples with higher educational certificates increase participation in wage gains. However, Spitzenpfeil and Andreß (2014) do not find any evidence supporting this assumption for West Germany. Their results even indicate that educational homogamy has counteracted inequality. Such a surprising impact may be due to couples with higher education spreading more across the entire income distribution. Even if these couples do have higher income gains, their relative frequency within the upper half of the distribution might have decreased because we find other types of households like single or pensioner households even more often over time. Alternatively, *if highly educated couple households dominate, we should observe that their higher incidence has contributed to the dispersion of the upper half of the income distribution.*

The *war and postwar generation* might have spread the income distribution, too (Chauvel and M. Schröder 2014). This generation has achieved high wage growth in the post-war boom and built high public pension claims as well as (in many cases) high private retirement income (Bönke et al. 2016). These households might profit from their beneficial careers, granting them not only high pensions but also enabling them to build up capital income. Many members of these cohorts have retired within our observation period so that a larger share of pensioners will be located within the upper rungs of the income distribution. *Thus, we expect that high income pensioner households, driven by the war and postwar generation, partly explain increased income dispersion.*

4 Data, variables and methods

4.1 Data

We use waves 1993-1994 and 2014-2015 of the German Socio-Economic Panel (GSOEP V32). It is well known that the *GSOEP* hardly allows detailed multivariate analyses of the top percentile of the income distribution. Combining *GSOEP* and the *German Taxpayer-Panel*, Bach, Corneo, and Steiner (2013) find that even though all households of the *GSOEP* high-income-sample are located in the top 20% of the much more precise *German Taxpayer-Panel*, only few of the *GSOEP* households are located within the top percentile of the merged data. Our aim, however, is not to make statements on the super-rich households of Germany, but to analyze processes that have dispersed the *top half* of the income distribution. We caution that the top one percent might display special characteristics that we cannot capture and might influence our analysis to some extent. We use a list wise deletion for missing cases but impose no further restrictions on the sample.

4.2 Variables

The dependent variable is the logged post-tax equivalent household income deflated to 2014 (Wagner, Frick, and Schupp 2007). We use the OECD equivalence scale, which weights the household head with 1 and adds a 0.5 weight for each additional household member older than 14 and 0.3 for all members under 14 years. Income richness is captured at the household level. Our unit of analysis are therefore households. Consequently, all variables measure household characteristics.

Educational composition uses three education groups based on the *International Standard Classification of Education*: no professional qualification (ISCED 1-2), completed vocational training (ISCED 3-4) and higher education (ISCED 6). These categories further distinguish

between single and couple households. Couple households of which one partner has no qualification while the other shows a vocational or academic degree are combined to one category because of sample size. Thus, there are seven categories: no qualification (single), vocational training (single), academic (single), both without qualification, couple with only one qualification, both with vocational training, both with higher education.

We classify household labor force status mainly based on annual work hours of household members into eight categories. First, we define *pensioner households* as households in which a pensioner is the breadwinner contributing at least half of the total household incomes out of labor and pensions. If income from pensions and wages (if pensioners continue to work to some extent) makes up more than half of total incomes, the household is considered a pensioner household[1]. All other households are categorized depending on the labor market integration of the working age household members. For this, every individual's working hours are set in relation to the maximum full-year fulltime working hours (2080 hours). *GSOEP* information on annual working hours is constructed using information on employment status in the survey year, average number of hours worked per week, and the number of months worked in the previous year (reported in the activity calendar). This continuous variable for individuals therefore ranges from 0 to 1 and is then added up for all individuals of working age in the household and then divided by the number of working age persons in the household. Our resulting variable on household labor market integration therefore ranges from 0 to 1 again. *Zero-earner households* have close-to zero labor market integration (maximum .1). We classify households with only one person of working age as either *single working full-time* (at least .95) or *single working part-time* (between .45 and .95). *Households with low work intensity* (either singles or couples) have values between .1 and .45 so that their sum of annual working hours amounts to less than half a single full time equivalent. *Double-earner households* have close-to full employment (at least .95). The *breadwinner household* has values between .45 and .55, those with a *top-up earner* between .55 and .95.

Our analyses take into account whether any household member is a civil servant or self-employed, which is important for social security contributions of these households as well as income opportunities. Distinguishing *capital income* from earnings of private households poses well known problems. Especially in smaller companies, incomes of the self-employed are often

[1] A number of households have both pensioners and partners who earn the major part of total household income. We code those as 'top-up earner households' as pensions constitute no more than an additional income source in these cases.

incomes which derive largely from individual labor so that it is hard to draw a line between labor earnings and capital income. We consider the variable for self-employed household heads therefore as a combination of capital and earned incomes.

Transfer incomes summarize private and public transfers. According to Grabka (2015), private transfers mostly stem from child alimony. In the top half of the distribution public transfers mainly consist of child allowances.

Income tax data in the *GSOEP* do *not* refer to actual taxes but to a household tax simulation (Schwarze 1995). Therefore, our analyses do not take into account tax refunds (unknown in the simulation model) even though it is well known from other data sources that these refunds have significant size and even grow strongly towards the top of the distribution (Arndt et al. 2011). The *GSOEP* tax variable assumes that households do not use loophole or refund tax strategies which, obviously, is not a realist assumption. Unfortunately, there is no other information on income tax burdens available in the *GSOEP*.

Total *household payroll taxes* (social security contributions) are simulated, as well. In contrast to the income tax information, we assume social security contributions to be precise as they represent an ultimate withholding tax. However, they might not be precise for the self-employed and civil servants as both groups may be either part of the public social security system or some other private insurance system. We control for households with member(s) of these groups in order to control for possible income differences due to this specialty.

In order to control for *demographic processes,* we distinguish between households with and without children and between households in West and East Germany. Finally, we differentiate between households in which the head is younger than 30 years ("young household"), is a woman, or has migration background. Note that we do not include a variable for single households because our educational composition categories use the single household information.

4.3 Methods

Our hypotheses call for a method that analyzes contributions of household types, income sources, and taxes to changes of the upper half of the household income distribution. In order to do so, we estimate unconditional quantile regressions (UQR) for each period and for each percentile from the median to the top of the income distribution to identify the influence of each

household type on the respective quantile value (Firpo, Fortin, and Lemieux 2009).[2] Subsequently, we apply a twofold Oaxaca-Blinder-Decomposition (OBD) to the percentile income differences between 1993/94 and 2014/15 yielding composition effects, on the one hand, and income structure effects, on the other hand (Fortin, Lemieux, and Firpo 2011). For categorical variables, composition effects represent changes in relative frequencies of household types. Composition effects of metric variables represent changes of typical characteristics within the population (e.g. average capital income). In contrast, income structure effects reflect changes of household types' probability to cross a specified quantile value with their household income.

A composition effect of 0.1 on the 70. percentile attributable to pensioner households would thus refer to changes in the relative incidence of these households above the 70. percentile (as we might find more pensioner households with high pensions above the 70. percentile). In this particular case, the composition effect of pensioner households increases the 70. percentile by 0.1 log points *ceteris paribus.*

An income structure effect of -0.1 on the same percentile attributable to capital income needs a different interpretation. It refers to changes in the probability to cross the 70. percentile value given one unit more of capital income – assuming that average capital income has not changed in the population. Changes in that probability reflect changes in the "ability" of a household attribute to locate the household above a specified household income (the percentile value). The decomposition coefficient expresses the influence of this change on a percentile value. A coefficient of -0.1 for capital income would thus mean that households need *more* capital income to cross the 70. percentile value with their disposable household income *ceteris paribus*. If there is the same amount of capital income (as we assume in a ceteris paribus assumption), a higher capital income requirement leads to a lower share of households who can meet that requirement, thus reducing the percentile value over time.

The estimates of an OBD are products of regression coefficients and expected values of the respective covariate. They are thus comparable among each other and should be interpreted as

[2] The common unconditional quantile regression constructs a RIF-variable for estimation, which rests itself on the estimation of the quantile value and the density around the quantile. However, the regression model does not take the estimation uncertainty of the quantile and density into account. A Bayesian estimation could handle that. However, Lubrano and Ndoye (2014) show with U.S. data that both kinds of estimation show hardly any differences. We thus report the results of the frequentist estimation strategy.

the total *contribution* of a household attribute to the *change of a percentile value* but not as a raw coefficient of a regression model.

As we pool three waves of the GSOEP, we cluster standard errors using a bootstrap with 1000 replications drawn with cross-sectional weights (Kolenikov 2010).[3]

5. Results
5.1 Descriptive Results
5.1.1 The dispersion of the upper half of the household income distribution

Between the early 1990s and 2014/15, the top half of the German income distribution has dispersed considerably (Figure 3). Median disposable household income has risen about 6% in this period, while incomes at the threshold to the top 20% of all households increased by 10%. Income progress in the top percentiles was steeper. The values for the 90th, the 95th and 99th percentiles have risen by 11%, 16% and 18% respectively. For further discussions, it is useful to develop a notion of the *absolute* new spread between middle and high incomes. Assuming a single household, we estimate the distance between a medium household and a newly rich (92. percentile) household to have risen by almost 3500 Euros net (real 2024) between the early 1990s and the present. If, for example, two families (1 child, total of 1.8 person weights) from the middle and "top" are compared, the new spread grew by about 6250 Euros or – depending on number and age of household members – even more. These differences hint at strikingly divergent paths of participation that have developed in a historically short period of roughly 20 years.

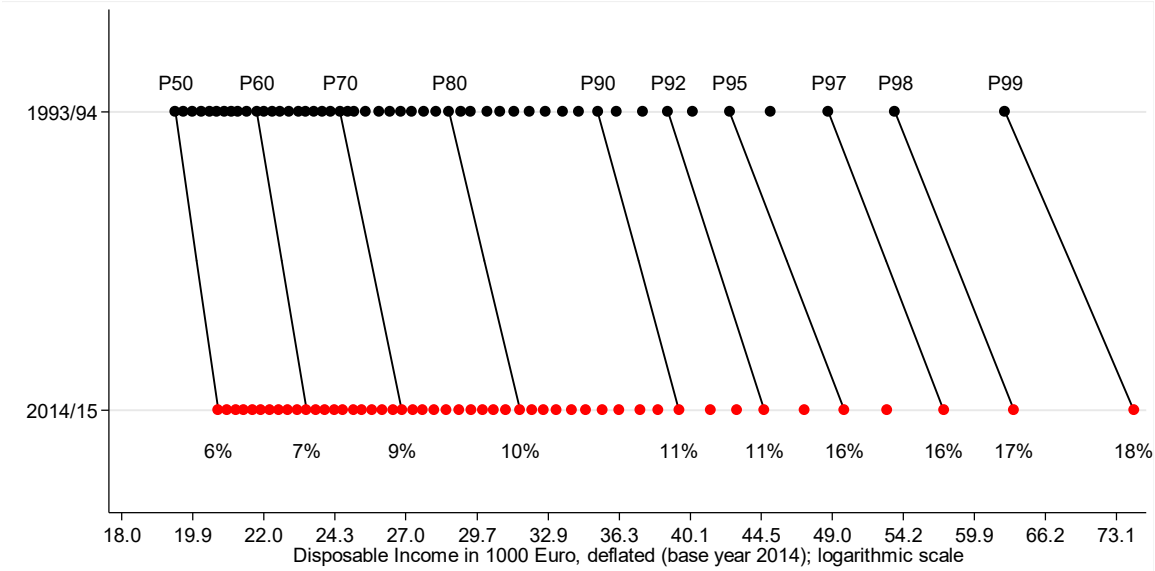

Figure 3: Changes of percentile values from 1993/94 to 2014/15.

[3] Annex A presents a detailed presentation of methods.

5.1.2 Changes of income sources, tax burdens, and household types

The left part of Figure 4 plots changes of average incomes from different sources over the upper half of the disposable income distribution. Household labor income decreases from the median to the 70. percentile but increases sharply towards the top of the distribution. The decrease of labor income in the upper middle of the distribution is most likely a result of more pensioner households in this area (see also table 1).

The average values of pensions and transfers have increased throughout the upper half. We find steep increases for both labor income and capital income in the upper parts of the distribution over time. These results point to our initial discussion that high labor and capital incomes go hand in hand nowadays. Increases of *both* income sources are the major driver of increases in pre-tax household incomes, which are plotted in the right hand side of Figure 4. This graph supports our above discussed hypothesis that taxes and social security contributions might have increased income richness. Over the entire top half of the income distribution, real household gross incomes have risen faster and faster in absolute terms. Neither income taxes nor payroll taxes are anywhere near the amount of that increase. Payroll taxes have increased somewhat. We only see some minor increases for top percentiles. Beginning at the 85th percentile, income taxes increase more rapidly but this increase is small compared to the steep increase of pre-tax household income. If the tax system had reacted progressively enough to compensate for the dispersion of household income more or less fully, then the graph depicting the taxes would have risen, *ceteris paribus*, more or less as much as the one depicting household pre-tax income. Any distance between both graphs means *ceteris paribus* a spread of the top half of the income distribution, caused by taxes falling behind overall income growth. At the same time, it is worthwhile to remember that the GSPOEP very likely overestimates the sum of actual tax burdens towards the top so that we can be quite certain that actually, taxes have fallen behind even further than GSOEP data imply. Even though the *level* of simulated taxes has increased altogether in the top half of the German income distribution, higher tax burdens reflect only to some minor extent the visibly stronger rise of household incomes. Especially the increase of gross household incomes in the top parts of the distribution together with a comparatively small rise of payroll taxes supports our expectations.

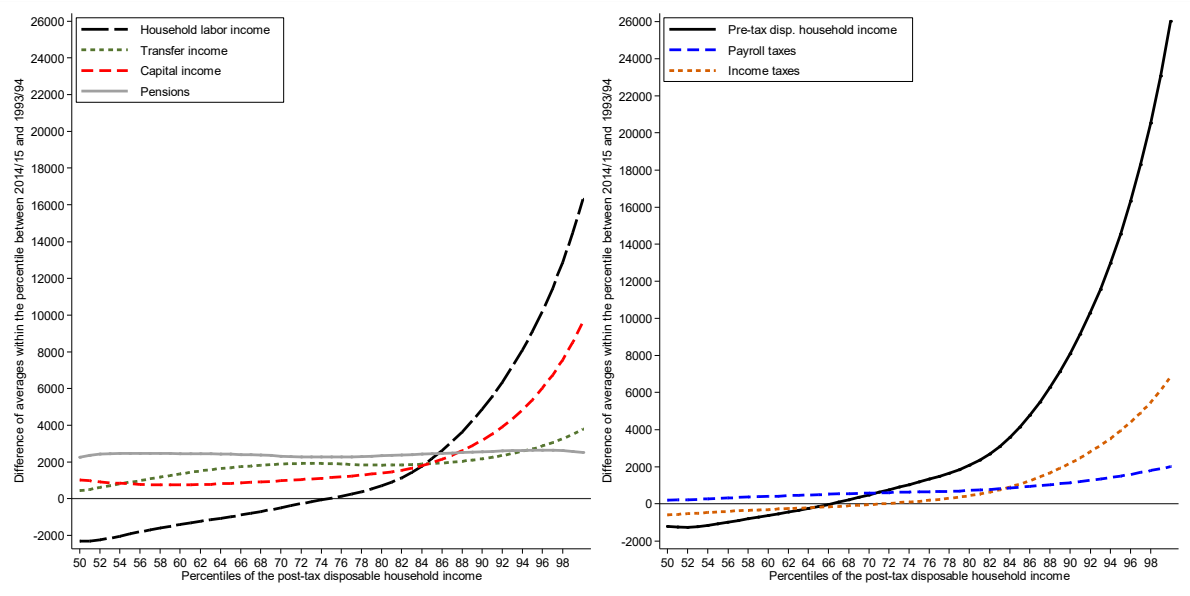

Figure 4: Average differences of income sources (left) and taxes and pre-tax household income (right) between 2014/15 and 1993/94. Note: lines based on LOWES-smoother. All income variables equivalence weighted.

Nevertheless, alternative explanations of this striking tax lag must not be discarded at this point. Theoretically, a strong increase of pensioner households in the top percentiles or other compositional or demographic changes might have caused insufficiently progressive taxation.

Table 1 shows the changes of household types' incidence within 10 intervals of the upper half of the income distribution. Pensioner incidence is up about 13 percentage points around the median and 5 percentage points within the top 5% of the income distribution. The breadwinner model, the top-up-earner, and double earner households decrease incidence across the upper half. These declines mirror strong gains of pensioner and single households.

Besides pensioners, *no* household type increases its incidence significantly *in the top decile*. This observation is striking as we would expect major changes if employment shifts were to be the major source of higher dispersion. The increase of pensioner households is more pronounced between the median and the 75. percentile compared to the top. As pensioner households tend to be correlated positively with income across the distribution, it seems likely that higher pensioners incidence have muted inequality. Yet, pensioners in the upper rungs of the distribution might have increased household income even more so that they have contributed to increased richness in the end. We thus need to disentangle contributions of compositional changes and contributions of income structure changes in a multivariate decomposition.

Table 1: changes of household type incidence in the upper half of the income distribution between 2014/15 and 1993/94 in percentage points.

	Household Type							
	Pensioner	Zero-Earner	Double-Earner	Bread-winner	Top-up-Earner	Low Work Intensity	Single Fulltime	Single Part-time
P50-54	13.11	0.35	-4.33	-5.56	-8.83	3.01	3.22	0.56
P55-59	15.89	0.78	-5.14	-3.33	-11.37	2.18	-1.58	2.71
P60-64	10.20	-1.14	-6.23	-2.16	-7.71	3.34	4.31	0.01
P65-69	11.26	3.14	-2.30	-7.60	-9.86	5.06	-0.54	0.56
P70-74	10.70	2.48	-6.92	-5.17	-4.32	3.40	1.67	-1.98
P75-79	11.48	0.96	-4.04	-3.71	-9.53	2.77	0.02	1.42
P80-84	3.96	2.08	-6.07	-2.13	-7.00	0.64	6.62	1.55
P85-89	7.25	1.06	-10.58	3.25	-6.91	1.30	2.94	1.83
P90-94	7.25	-0.65	-7.74	-2.70	-1.60	0.23	2.11	2.43
P95-99	5.41	0.36	0.74	-0.74	-7.09	0.45	2.86	-0.87

5.2. Multivariate Results

In a first step, we present decomposition results for selected points of the distribution (table 2) and sum up coefficients in groups to give a big picture of sources of increased richness. Subsequently, we confront the data with our expectations using detailed graphs.[4]

5.2.1 The Big Picture

The first lesson we learn from table 2 is that composition effects are considerably less relevant than income structure effects *for the dispersion* of the upper half of the income distribution. Taken together, changes in household type incidence, capital income, and taxes increase household income *at all* percentiles. However, compositional changes do not seem to have contributed *asymmetrically* to upper tail income growth. Compositional changes have lifted the median by about 10.3%.[5] The model shows contributions of almost equal size for the 80th percentile (10.8%) and the percentiles above. In sum, compositional changes cannot explain increased income richness.

In contrast, changes in the income structure run very asymmetrically across the upper half and thus seem to be the major force behind increases of income richness. They would have decreased the median by 3.9% but would have increased the value of the 96th percentile by about 9%. The sum of these contributions are a mix of overlapping impacts. Changes in the

[4] In the decomposition, coefficients depend on the choice of the reference category and therefore the respective constant. Model constants represent the changed influence of a typical reference group household in West Germany that consists of a family with children, without migration background with a top-up earner, and a male household head. Both parents have completed vocational training and are employees. Results reflect deviations from such a typical German household.

[5] Percentage values result from exponentiation. For example: (exp(0.098)-1)*100=10.296%.

income structure associated with households' labor force status, other labor market positions, and payroll taxes are major drivers of richness, whereas income taxation mutes inequality to some extent. To put it simply: even though direct household taxes did indeed increase towards the top, these increases were by far not as strong as even stronger income growth would have required.

Changes of taxes and social security contributions represent the most important sources of more income dispersion. Decomposition results stress that the changed impact of taxes runs asymmetrically across the distribution. The tax system has developed a dramatic imbalance after German reunification, as described in chapter 3.2. Compared to the early 1990s, social security taxes are nowadays a larger burden for households in the middle, while households in the top area have enjoyed strong reliefs relative to their income gains. Although rich households without doubt nowadays pay more taxes in *absolute* numbers, increases of tax burdens do not reflect much stronger income gains. The German increase of richness is mostly homemade and has been produced by political will.

Table 2: Results of multivariate Oaxaca-Blinder-decompositions of changes in unconditional quantile values between 2014/15 and 1993/94

	P50	**P80**	**P90**	**P93**	**P96**	**P50**	**P80**	**P90**	**P93**	**P96**
Δ Quantile Values	0.059***	0.097***	0.112***	0.135***	0.163***	0.059***	0.097***	0.112***	0.135***	0.163***
2014/15 to 1993/94	(0.006)	(0.007)	(0.009)	(0.011)	(0.013)	(0.006)	(0.007)	(0.009)	(0.011)	(0.013)
	Contributions of Compositional Changes					**Contributions of Income Structure Changes**				
Educational Structure	0.024***	0.019***	0.011***	0.006	-0.005	-0.045***	-0.010	-0.031	-0.015	0.028
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.013)	(0.016)	(0.020)	(0.024)	(0.032)
Labor Force Status	0.012***	0.022***	0.041***	0.041***	0.030***	0.012	0.024	0.070**	0.118***	0.114**
	(0.002)	(0.003)	(0.004)	(0.005)	(0.006)	(0.014)	(0.017)	(0.025)	(0.028)	(0.035)
Other Labor Market Positions	-0.003***	-0.004***	-0.001	0.001	0.002	-0.002	0.000	0.022**	0.029**	0.039**
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.003)	(0.005)	(0.008)	(0.010)	(0.014)
Transfer Income	0.011***	0.016***	0.021***	0.019***	0.014***	-0.002	-0.006	0.010*	0.014**	0.005
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)	(0.005)	(0.007)
Capital Income	0.006***	0.004***	0.003*	0.002	0.002	-0.012***	-0.009	-0.000	0.005	0.016
	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.006)	(0.009)	(0.012)	(0.017)
Income Tax	-0.001**	0.005***	0.012***	0.017***	0.023***	0.009	-0.048***	-0.085***	-0.126***	-0.246***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.005)	(0.013)	(0.024)	(0.032)	(0.045)
Payroll Tax	0.055***	0.050***	0.046***	0.039***	0.015**	-0.071***	-0.023	0.174***	0.293***	0.389***
	(0.001)	(0.002)	(0.003)	(0.004)	(0.005)	(0.013)	(0.022)	(0.038)	(0.048)	(0.067)
Sociodemographics	0.007***	0.012***	0.013***	0.014***	0.011***	-0.016	-0.019	0.045	0.026	-0.028
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.014)	(0.018)	(0.024)	(0.027)	(0.036)
Constant						0.077**	0.064	-0.238***	-0.347***	-0.246**
						(0.029)	(0.034)	(0.052)	(0.065)	(0.088)
Total	0.110***	0.123***	0.146***	0.140***	0.094***	-0.049***	-0.025**	-0.032**	-0.004	0.071***
	(0.003)	(0.004)	(0.007)	(0.008)	(0.011)	(0.008)	(0.009)	(0.011)	(0.013)	(0.017)
N	44900	44900	44900	44900	44900	44900	44900	44900	44900	44900

Standard errors based on a bootstrap with 1000 replications using replication weights on the household level; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

5.2.2 What are the major sources?

We will now look in more detail at major drivers of new income richness. Chapter IV of the appendix includes graphs for all coefficients.

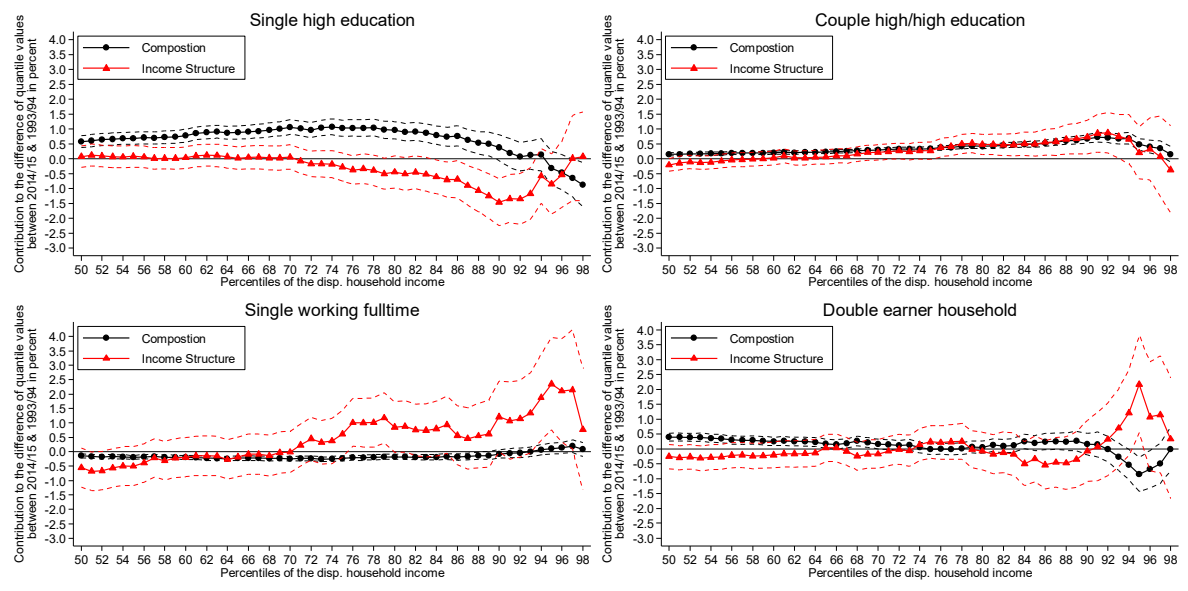

Figure 5: Contribution of selected households for the change of the unconditional quantiles between 2014/15 and 1993/94. Dashed lines represent 95% confidence intervals. The reference category for the upper panel is "Couple medium/medium education" and for the lower panel "Top-up earner household".

If labor income alone was the major driver of dispersion, we should observe a higher importance of households with high educational credentials and/or high work intensity. The results depicted in Figure 5 do not support such claims. Highly educated singles do not influence upper percentiles accordingly. Their incidence increased throughout the upper half of the distribution, increasing percentile values between the median and the 90th percentile with about 0.5% - which is close to nothing. Their income structure contribution is also close to zero or even mildly negative for upper percentiles. Contributions for highly educated couples do indeed grow over the distribution, but their size is comparatively small, ranging from 0.2% for the 75th percentile to about 0.7% for the 93th percentile. From the 94th percentile on, we cannot distinguish the their income structure contribution from zero. If human capital accumulation within households was a major driver of inequality (as assumed by the homogamy hypothesis), we should observe a growing contribution of couples holding both degrees of higher education across the upper half of the distribution. The data do show such a growing contribution – but the growth increases from zero to little more than zero. We conclude that neither the homogamy of highly educated couples nor labor market positions associated with high education *per se* drive new income richness in Germany.

The same conclusion applies to household labor intensity. If the new income richness was a result of more households working longer hours, we should observe a growing contribution of singles working fulltime and of double earner households. The results in the lower panel of Figure 5 do not support this claim. Income structure contributions of fulltime working singles increase towards the top but the estimation is imprecise and small in size. Thus, we can discard labor market positions as *direct* sources of new income richness. We will now turn to other sources.

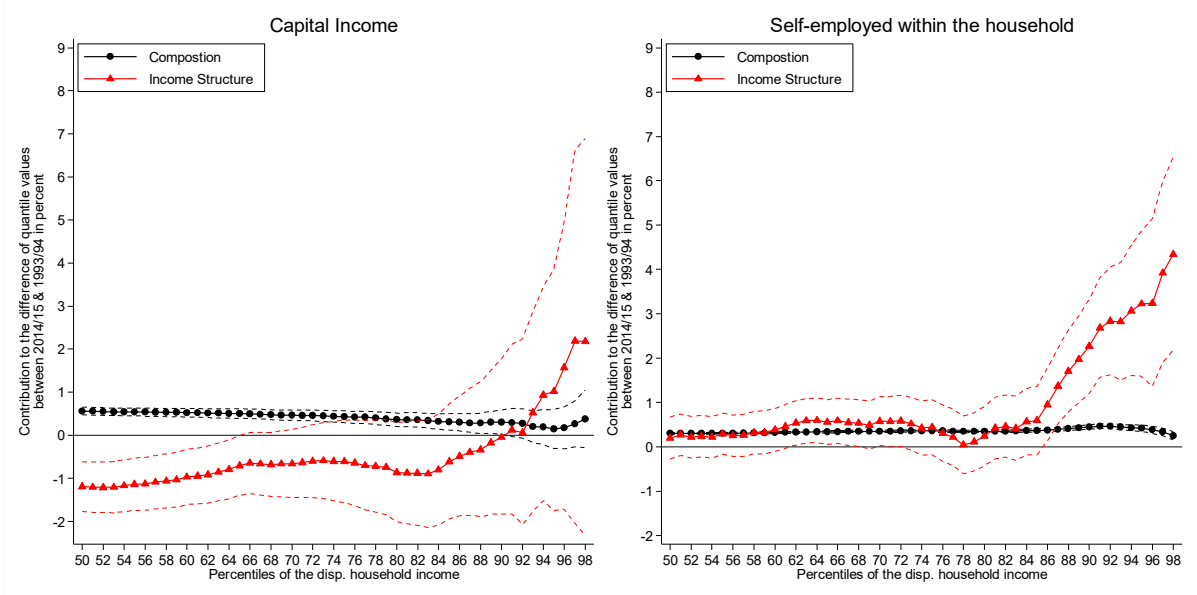

Figure 6: Contribution of capital income and households with self-employed members for the change of the unconditional quantiles between 2014/15 and 1993/94. Dashed lines represent 95% confidence intervals.

According to figure 6, capital income is not a major source of increased richness. To the contrary, the increased amount of capital income increases percentiles above the median but not so for upper percentiles. This may come as a surprise given the results of Figure 4, which indicated higher amounts of additional capital income for households located in the upper tail. The solution to this puzzle is that the multivariate models express relational inequality. An increase of 1000 € capital income at the median could transform into a higher relative income gain compared to 3000 € additional capital income within the upper 10%. The estimates suggest that the *general* increase of capital income across the upper half compressed the income distribution. However, the size of these contributions is quite small with about 0.5%. They are countered by a negative income structure effect around the median. As more households have capital income, it gets harder for others to hold pace without or lower amounts of capital income. As more households fall behind (even a little bit), they lose ranks within the income distribution, which translates into a negative income structure effect. The point estimates further suggest a growing increase of capital income for upper percentiles, but our estimation is very

noisy there. We caution that the information about capital income in the GSOEP is very limited, biasing downwards our results with certainty.

Also, households might profit from capital in other ways than from income flows out of assets, renting, or dividends. Figure 6 further shows that households with at least one self-employed member did contribute to the dispersion of upper tail inequality. The models estimate no contribution of households with self-employed members from the median to the 85th percentile but do estimate a steep increase in their contribution based on income structure changes within the upper 15% of the distribution. Self-employed in the upper rungs of the income distribution are most certainly beneficiaries of the economic upswing in Germany during the past 20 years holding either larger firms or profitable smaller enterprises. These households have profited strongly from increased revenues and/or profitability. The income structure contribution of households with self-employed ranges from about 1% for the 85th percentile to about 4% for the 98th percentile. These households are thus without doubt one driver of new income richness – but they can by far not account for the large increases of upper percentile values as depicted in figure 3.

In line with our expectations, pensioner households are an important driver of upper tail dispersion. Their increased incidence does not matter much, though, as contributions based on compositional changes account for just about 1.5% to 2% across the entire upper half. In contrast, we estimate a strong asymmetrical structural contribution. While pensioners' impact is negligible from median to the 85th percentile, they contribute from 2% at the 85th percentile to about 9% at the 95th percentile. They are thus the major source within the *aggregate* positive labor force status contribution reported in table 2 and explain a sizable part of the new upper tail dispersion. The increase of this contribution *within the observed time interval* strongly suggests that at least some part of the cohort entering the labor market around the 1960s still profits from past high earnings and stable labor market careers.

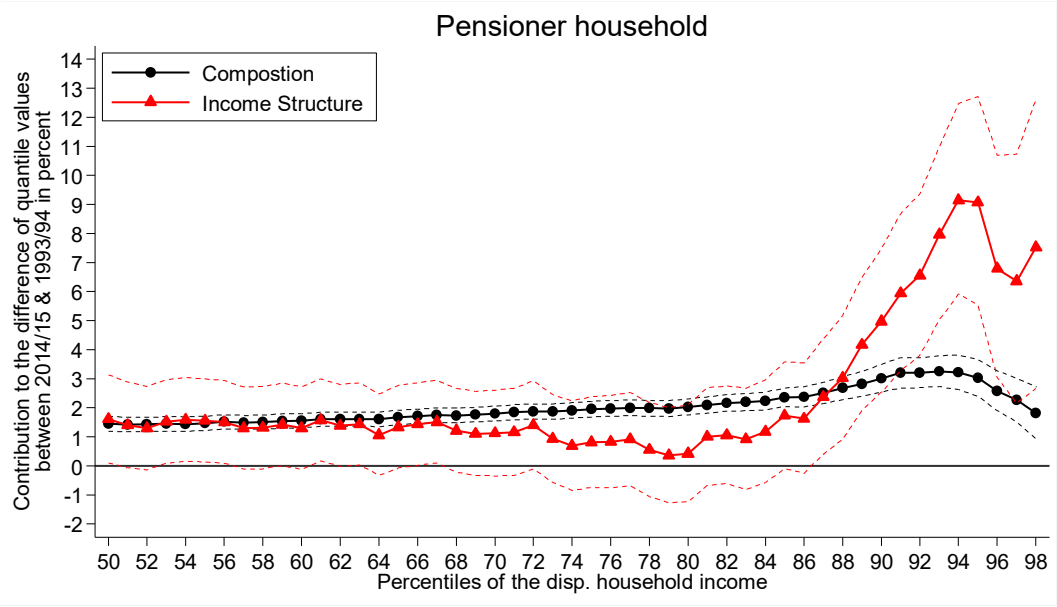

Figure 7: Contribution of pensioner households for the change of the unconditional quantiles between 2014/15 and 1993/94.

The results presented in table 2 suggested that taxation played a major role in new income richness. Figure 8 elaborates our results further.

The right hand side shows very clearly that income taxation is progressive in Germany and that it has muted upper tail dispersion. Over time, households above the 70th percentile pay more income taxes and this burden increases strongly towards the top. All else equal, a higher tax burden would have lowered upper percentile values by 25% to 35%. However, we also estimate a notable, but small contribution of tax reliefs for high incomes contributing to increases in the value of the 90th percentile for about 1% and for the 98th percentile value for about 3%.

The left hand side of Figure 8 depicts the massive contribution of payroll taxes for upper tail dispersion. Higher social contribution thresholds have increased the tax burden for households around the median, leading to a negative income structure contribution of about 8%. As incomes from wages increase within households, this *additional* tax burden decreases. Wages for households in this area seem to increase in parallel fashion with contribution thresholds. Consequently, we cannot distinguish the contribution of payroll taxes from zero between the 63th and the 87th percentile. From there on, however, it seems that we find more households with wages above the contribution thresholds, developing a massive economic advantage within the German tax system over time. As incomes from labor income grew especially for households in the upper parts of the distribution (see Figure 4), this pre-tax income boost translates into a strong post-tax increase and a very asymmetric contribution within the upper 15% of the distribution. Decreases of the payroll tax burden *alone* would have increased upper percentile values by about 40% to 75% for the 98th percentile. Our estimations come with some

uncertainty about the size of that contribution, but we are certain that the architecture of social security contributions in combination with wage polarization is *the major driver behind new income richness in Germany*. *The German tax system is the perfect environment for the rise of the working rich*. Our results indicate that it does not matter whether working rich households are single or coupled with high degrees or labor market integration. It just matters that at least one household member pushes its labor income above the social contribution thresholds. Thus, it pays off to be working rich, because every further increase of the labor income translates into a more beneficial pre-tax to post-tax transition.

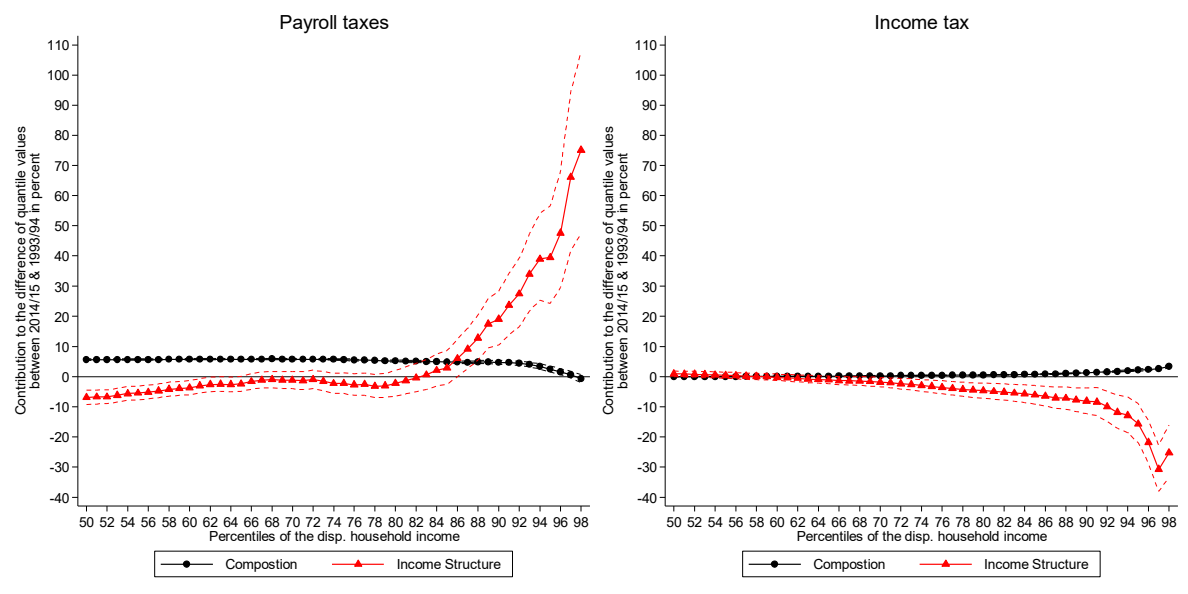

Figure 8: Contributions of payroll taxes and income tax for the change of the unconditional quantiles between 2014/15 and 1993/94. Dashed lines represent 95% confidence intervals. The graphs show exponents of coefficients.

6. Conclusions

The gap between middle and high household incomes has opened significantly since German reunification. Germany is indeed a special case of increased income richness, but in a quite unexpected way. Capital income seems to play a less important role. The one big advantage for the working rich in Germany stems from a different point. The growth of top wage earnings has received insufficient taxation due to payroll tax exemptions for large parts of these gains. So, yes, new income richness in Germany is mainly a result of wage earnings, but the German tax system has rolled out a red carpet for the working rich.

Some peculiar German tax splitting rules give this red carpet some extra length. If the main earner, most probably a male in higher regions of the income distribution, earns a wage above the social security threshold, he can pool that income with his wife for taxation. Afterwards the

total income is divided in half, reducing the tax burden for the husband, translating individual earning advantages beyond the thresholds into a household advantage. This way, the tax system sets strong incentives for households to have one high wage earner and one moderate wage earner. Since German women tend to use long motherhood breaks in international comparison, this system conserves traditional family structures, which are not in favor of women's careers.

Our results do not indicate that education and labor market integration are meaningless for income richness. However, the tax system strongly moderates their contributions. If a household reaches the point in which its members earns wages above the social security thresholds, it does not *matter much* whether it is a top-up earner household, a single or a dual-academic household. Nevertheless, we stress that education is crucial in getting beyond the thresholds in the first place. It fits this picture that the two main *additional* drivers of the income richness are households with self-employed and pensioner households. Both household types may have income sources largely independent from wages and thus form additional contributions to the dispersion of the upper half of the income distribution.

We conclude that the sources behind the new income richness can be found in the architecture of the German tax system because it was not able to catch the strong polarization of the wage structure. The powers that influence the distribution of income have been strong enough to reshape the entire German model. "There are powerful forces pushing alternately in the direction of rising or shrinking inequality. Which one dominates depends on the institutions and policies that societies choose to adopt" (Piketty and Saez 2014, 843). Strong hikes of social security taxes have relieved public budget crises after reunification and have struck middle incomes most severely. In comparison, capital incomes and top earnings were rather spared. This new distributional model displays a fundamental lack of solidarity that now characterizes Germany. Fighting income inequality in Germany thus would need a far-reaching reform of the German tax system.

References

Alvaredo, Facundo, Tony Atkinson, Thomas Piketty, and Emmanuel Saez. 2012. "The World Top Incomes Database." Accessed June 23, 2014. http://topincomes.g-mond.parisschoolofeconomics.eu/.

Arndt, Christian, Martin Biewen, Bernhard Boockmann, and Rosenmann, Martin et al. 2011. *Aktualisierung der Berichterstattung über die Verteilung von Einkommen und Vermögen in Deutschland für den 4. Armuts- und Reichtumsbericht der Bundesregierung. Gutachten für das Bundesministerium für Arbeit und Soziales.* Bonn.

Atkinson, Tony, Thomas Piketty, and Emmanuel Saez. 2011. "Top Incomes in the Long Run of History." *Journal of Economic Literature* 49 (1): 3–71.

Bach, Stefan, Martin Beznoska, and Viktor Steiner. 2016a. *Wer trägt die Steuerlast in Deutschland? Verteilungswirkungen des deutschen Steuer- und Transfersystems.* DIW Berlin: Politikberatung Kompakt 114. Berlin: DIW Berlin Deutsches Institut für Wirtschaftsforschung.

———. 2016b. "Wer trägt die Steuerlast in Deutschland? Steuerbelastung nur schwach progressiv." *DIW-Wochenbericht* 83 (51/52): 1207–16.

Bach, Stefan, Giacomo Corneo, and Viktor Steiner. 2009. "From Bottom to Top. The Entire Income Distribution in Germany, 1992-2003." *Review of Income and Wealth* 55 (2): 303–30.

———. 2013. "Effective Taxation of Top Incomes in Germany." *German Economic Review* 14 (2): 115–37.

Bartels, Charlotte, and Katharina Jenderny. 2015. "The role of capital income for top incomes shares in Germany." WTID Working Paper 2015/1.

Bartels, Charlotte, and Carsten Schröder. 2016. "Development of Top Incomes in Germany Since 2001." *DIW Economic Bulletin* 6 (1/2): 3–8.

Beimann, Boris, Rainer Kambeck, Tanja Kasten, and Lars-H Siemers. 2011. "Wer trägt den Staat? Eine Analyse von Steuer-und Abgabenlasten.".

Biewen, Martin, and Andos Juhasz. 2012. "Understanding Rising Income Inequality in Germany, 1999/2000-2005/2006." *Review of Income and Wealth* 58 (4): 622–47.

BMAS. 2014. "Der vierte Armuts- und Reichtumsbericht der Bundesregierung.".

Bönke, Timm, Markus Grabka, Carsten Schröder, Edward N. Wolff, and Lennard Zyska. 2016. "The joint distribution of net worth and pension wealth in Germany." SOEPpapers on Multidisciplinary Panel Data Research 853.

Bundesministerium der Finanzen. 2011. "Kassenmäßige Steuereinnahmen nach Steuerarten in den Kalenderjahren 2006 – 2010.".

Chauvel, Louis, and Martin Schröder. 2014. “Generational inequalities and welfare regimes.” *Social Forces* 92 (4): 1259–83.

Corneo, Giacomo. 2005. “The rise and likely fall of the German income tax, 1958–2005.” *CESifo Economic Studies* 51 (1): 159–86.

Corneo, Giacomo, Timm Bönke, and Christian Westermeier. 2016. “Erbschaft und Eigenleistung im Vermögen der Deutschen: Eine Verteilungsanalyse.” *Perspektiven der Wirtschaftspolitik* 17 (1): 35–53.

Dell, Fabien. 2007. “Top Incomes in Germany Throughout the Twentieth Century 1891-1998.” In *Top incomes over the twentieth century: a contrast between continental european and english-speaking countries*, edited by Anthony B. Atkinson and Thomas Piketty, 356–426: Oxford University Press.

Drechsel-Grau, Moritz, Andreas Peichl, and Kai D. Schmid. 2015. “Einkommensverteilung und gesamtwirtschaftliche Entwicklung in Deutschland.” *Wirtschaftsdienst* 95 (10): 684–88.

Esping-Andersen, Gøsta. 2007. “Sociological explanations of changing income distributions.” *American Behavioral Scientist* 50 (5): 639–58.

Firpo, Sergio, Nicole M. Fortin, and Thomas Lemieux. 2009. “Unconditional Quantile Regressions.” *Econometrica* 77 (3): 953–73. Accessed February 13, 2015.

Fitzenberger, Bernd. 2012. “Expertise zur Entwicklung der Lohnungleichheit in Deutschland.”.

Fortin, Nicole M., Thomas Lemieux, and Sergio Firpo. 2011. “Decomposition Method in Economics.” In *Handbook of Labor Economics*, edited by Orley Ashenfelter and David Card. 1st ed., 1–102. Handbooks in economics 4a. Amsterdam: North-Holland.

Fräßdorf, Anna, Markus M. Grabka, and Johannes Schwarze. 2011. “The Impact of Household Capital Income on Income Inequality.” *Journal of Economic Inequality* 9 (1): 35–56.

Frick, Joachim R., and Markus M. Grabka. 2003. “Imputed rent and income inequality: A decomposition analysis for Great Britain, West Germany and the US.” *Review of Income and Wealth* 49 (4): 513–37.

Goebel, Jan, Martin Gornig, and Hartmut Häußermann. 2010. “Polarisierung der Einkommen: Die Mittelschicht verliert.” *DIW Wochenbericht* (24): 2–8.

Grabka, Markus M. 2015. “Income and wealth inequality after the financial crisis: the case of Germany.” *Empirica* 42 (2): 371–90.

Hansen, Marianne N. 2014. “Self-Made Wealth or Family Wealth? Changes in Intergenerational Wealth Mobility.” *Social Forces* 93 (2): 457–81. doi:10.1093/sf/sou078.

Horn, Gustav A., Sebastian Gechert, Miriam Rehm, and Kai D. Schmid. 2014. *Wirtschaftskrise unterbricht Anstieg der Ungleichheit. IMK Report*, no. 97.

Jenderny, Katharina. 2015. *Top Incomes: the Case of Germany:* Freie Universität Berlin.

Kaplan, Steven N., and Joshua Rauh. 2013. “It's the market: The broad-based rise in the return to top talent.” *The Journal of Economic Perspectives* 27 (3): 35–55.

Kolenikov, Stanislav. 2010. “Resampling variance estimation for complex survey data.” *Stata Journal* 10 (2): 165–99.

Lemieux, Thomas. 2010. “What Do We Really Know About Changes in Wage Inequality?” In *Labor in the New Economy*, edited by Katharine G. Abraham, James Spletzer, and Michael J. Harper, 17–59. Chicago, London: University of Chicago Press.

Lubrano, Michel, and Abdoul Ndoye. 2014. “Bayesian Unconditional Quantile Regression: An Analysis of Recent Expansions in Wage Structure and Earnings Inequality in the US 1992–2009.” *Scottish Journal of Political Economy* 61 (2): 129–53.

Neckerman, Kathryn M., and Florencia Torche. 2007. “Inequality: Causes and consequences.” *Annu. Rev. Sociol.* 33: 335–57.

OECD. 2011. “Divided We Stand: Why Inequality Keeps Rising.” *OECD Publishing*.

Peichl, Andreas, Nico Pestel, and Hilmar Schneider. 2012. “Does Size Matter? The Impact of Changes in Household Structure on Income Distribution in Germany.” *Review of Income and Wealth* 58 (1): 118–41.

Piketty, Thomas. 2014. *Capital in the twenty-first century:* Harvard University Press.

Piketty, Thomas, and Emmanuel Saez. 2003. “Income Inequality in the United States, 1913-1998.” *The quarterly Journal of Economics* 118 (1): 1–41. doi:10.1162/00335530360535135.

———. 2014. “Inequality in the Long Run.” *Science* 344 (6186): 838–43.

Sachverständigenrat. 2014. *Mehr Vertrauen in Marktprozesse.* Jahresgutachten / Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung

51.2014/15. Wiesbaden: Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung.

Schinke, Christoph. 2012. *Inheritance in Germany 1911-2009: A Mortality Multiplier Approach. SOEPpapers on Multidisciplinary Panel Data Research*, no. 462.

Schmid, Kai D., and Ulrike Stein. 2013. "Explaining Rising Income Inequality in Germany, 1991-2010." SOEPpapers on Multidisciplinary Panel Data Research 592.

Schupp, Jürgen, Tobias Gramlich, Bettina Isengard, Bernhard v. Rosenbladt, and Gert G. Wagner. 2003. "Repräsentative Analyse der Lebenslagen einkommensstarker Haushalte: Fachlicher Endbericht des Forschungsauftrags für das Bundesministerium für Gesundheit und Soziale Sicherung (BMGS).".

Schwartz, Christine R. 2013. "Trends and variation in assortative mating: Causes and consequences." *Annual Review of Sociology* 39: 451–70.

Schwarze, Johannes. 1995. *Simulating German Income and Social Security Tax Payments Using the GSOEP. Cross-National Studies in Aging Program Project Paper*, no. No. 19.

Spannagel, Dorothee. 2013. *Reichtum in Deutschland: Empirische Analysen.* Wiesbaden: Springer Fachmedien Wiesbaden.

Spitzenpfeil, Martin, and Hans-Jürgen Andreß. 2014. "Ist der Anstieg der westdeutschen Einkommensungleichheit auf die Zunahme bildungshomogener Partnerschaften zurückführbar?" *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie* 66 (4): 575–601.

Statistisches Bundesamt. 2014. "Fachserie 14 Reihe 7.1.1, 2010.".

Wagner, Gert G., Joachim R. Frick, and Jürgen Schupp. 2007. "The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements." *Schmollers Jahrbuch* 127 (1): 139–69.

Weeden, Kim A., and David B. Grusky. 2014. "Inequality and market failure." *American Behavioral Scientist* 58 (3): 473–91.

Westermeier, Christian, Anita Tiefensee, and Markus M. Grabka. 2016. "Inheritances in Europe: High Earners Reap the Most Benefits." *DIW Economic Bulletin* 6 (16/17): 185–95.