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Factor shares and income inequality - Empirical evidence from Germany 2002 - 2008

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No. 34

Factor Shares and Income Inequality
- Empirical Evidence from Germany 2002-2008

by

Martin Adler & Kai Daniel Schmid



FACTOR SHARES AND INCOME INEQUALITY

- EMPIRICAL EVIDENCE FROM GERMANY 2002-2008 *

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April 2012

Abstract

We examine the interplay between changes in the functional distribution of income and the distribution of market income among households. We use micro data from the German Socio-Economic Panel as well as macro data from the German Federal Statistical Office from 2002 to 2008. We categorize and evaluate the implications of changes in the functional distribution of income upon the distribution of income among individuals on the basis of a simple theoretic framework that links the degree of the concentration of income from asset flows among individuals to the (structural) relationship between individuals' levels of market income and their respective income shares from asset flows. Our empirical analysis offers two insights: First, the relative rise of income from asset flows reported by German National Accounting Statistics is also evident in the micro data taken from the German Socio-Economic Panel. Second, rising capital income shares are associated with an increasing concentration of market income.

Keywords: *Factor Shares, Income Distribution, Inequality, Market Income*

JEL Classification: *D31, D33, E6, E25*

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"There is no doubt that the functional distribution of income is only of minor importance with regard to social issues. Only if the functional distribution of income implied clear consequences with regard to the personal distribution of income, the former would be of social relevance." Krupp (1967: 3)¹

1 Motivation

The distribution of income has been a central topic within the economic literature as well as in social and political debate. As changes in the distribution of income imply alterations of the relative income position of different social groups, the phenomenon is closely connected to issues of social welfare or social justice with regard to income inequality. Against this background one can easily understand that the pronounced rise of the profit share reported in German National Account Statistics since the beginning of the last decade has been subject of political debate (see Horn et al. 2009, Krämer 2010, Schäfer 2010).

The relevance of changes in the profit share with regard to the personal distribution of income has often been motivated via changes within the functional distribution of income reported by National Account Statistics. However, it is the personal distribution of income that is relevant for social issues that focus on income inequality.² Therefore, National Accounts may be of little help when discussing income inequality as a facet of social justice. Besides this, the links between the functional distribution of income and the distribution of income among individuals are often implicitly exploited in a rather pragmatic manner paving the way for misinterpretation (see Dauderstädt 2010, Krupp 1967).³

¹ Cited from Becker/Hauser (1998) and translated by the authors.

² See Goldfarb/Leonard (2005) for a detailed documentation of the history of research on income distribution and the change of perspective from functional to personal aspects motivated by Friedman and Kuznets after the Second World War.

³ For example, Dauderstädt (2010) identifies a rising profit share with an aggravation of the distribution of income among individuals: *"The functional distribution between wages and profits has been worsening for a longer time-span for most EU countries."* [translated by the authors] However, such statements may be questioned in two respects: first, changes in the functional distribution of income reported in National Account Statistics do not clearly reflect changes in the structural composition of average market income of individuals. Second, it is also the concentration of capital income within the population that determines the effects of changing factor shares upon the distribution of income among individuals. For example, in Japan, the functional distribution of income is strongly tilted towards capital income, and yet the country has one of the world's most equal personal income distributions (see Aretz et al. 2009: 49).

The goal of our paper is to shed light on the effect of a rising profit share - that corresponds to a change in the functional distribution of income reported by National Accounts - upon the development of the distribution of individual market income - which is supposed to capture the personal distribution of income. The latter will be approximated by micro data taken from the German Socio-Economic Panel (GSOEP).

We will not address the driving forces that lay behind the pronounced shift of income shares reported in National Accounts in detail. Among other factors, a rising profit share (exceeding regular fluctuation patterns over the business cycle in the short run) is predominantly ascribed to the consequences of technological change as well as to the effects of globalization with regard to tightened competition in labor markets. For a discussion of these issues see, for example, Aretz et al. (2009), Horn et al. (2008), Krämer (2011) and Rodrik (2007) as well as the references cited therein.

Our examination takes two steps: First, we contrast the profit share reported by National Accounts - that treats labor earnings of the self-employed as capital income - with the share of capital income for the entire working population based on micro data taken from the GSOEP. Second, we approximate rising capital income shares on the basis of the income structure of individuals and compare different social groups such as white-collar and blue-collar employees as well as self-employed persons and civil servants.

The paper is structured as follows: Section 2 provides a description of the National Accounts macro data and the micro data taken from the GSOEP. In sections 3 and 4 we compare changes of the functional distribution of income with respect to the underlying data sources and different methods of computing capital shares. Next, we clarify the effects of rising capital income shares upon the distribution of individual market income on the basis of a simple theoretic framework (section 5) and match the theoretical implications with structural differences within the market income of different social groups (section 6). Section 7 examines the relationship of capital income shares and the concentration of market income over time. Finally we sum up and conclude (section 8).

2 Data

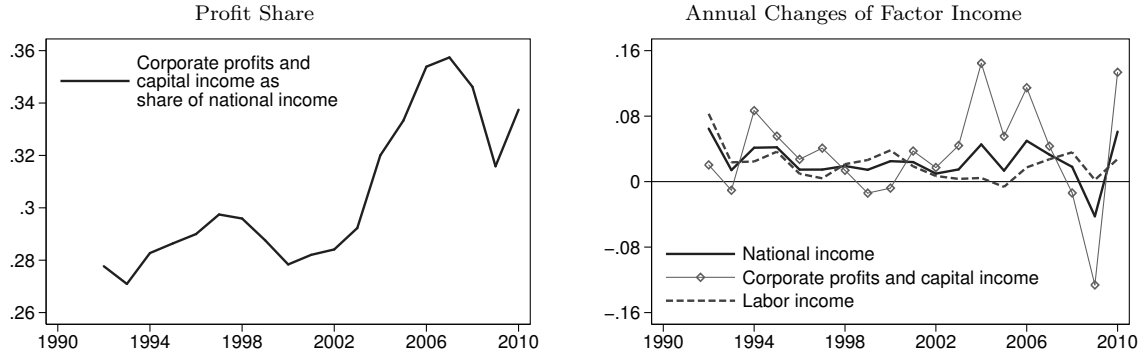
Our empirical analysis is based on micro data from the German Socio-Economic Panel as well as data from German National Account Statistics. The main analysis focuses on the time-span from 2002 to 2008. The starting point of the year 2002 is motivated through the availability of a high-income sample that comprises households with a monthly disposable income above 4.500 euros. Our examination period ends in 2008 as the newest income information available (by the time of conducting the empirical calculations for this paper at the end of the year 2011) was collected in 2009 in a retrospective manner and therefore offers the most up-to-date income information for the year 2008.

3 Factor Shares

The concept of the functional distribution of income contrasts labor income with profit income. Both income shares sum up to 100 percent of national income. Figure 1 (left panel) illustrates the pronounced increase of the profit share that has taken place within the time-span from 2002 to 2008. The profit share rises from 27.8 percent in 1992 to 34.6 percent in 2008.⁴ Within the years from 2002 to 2008 the profit share rose by 6.2 percentage points. The increase of the profit share accelerated in 2005, but dropped in 2008 due to the consequences of the financial crisis. Figure 1 (right panel) illustrates yearly growth rates of national income as well as profit and labor income and provides a more detailed picture of the changes in factor shares. In particular, here one can see that in 2008 profits declined due to the output losses of the global financial crisis. In contrast to this labor income still grew. As a result the profit share sharply decreased although corporate profits and capital income fell only slightly (about 1.5 percent) in 2008.

⁴ It has been argued that the increase in the 1990's was mainly due to the adaption process in former Eastern Germany with its traditionally high labor income share, while the increase in Western Germany was relatively weak (see, e.g., Aretz et al. 2009).

Figure 1: Factor Shares in German National Account Statistics



Source: German Federal Statistical Office (2011), GENESIS-Database, own calculations.

4 Individual Capital Income Share

Although the rise of the profit share based on National Accounts has regularly been part of political debate that is supposed to cover issues of income inequality among individuals or households, it is not easy to draw clear social or economic conclusions from the phenomenon of a rising profit share. In particular, one cannot directly compare factor shares in National Account Statistics to a functional structure of income approximated via micro data taken from the GSOEP (see below). Moreover, the capital income share reported in National Accounts can hardly be interpreted as a return to the production factor capital. It is rather a residual, encompassing both measurement error (e.g. considering depreciation) and income categories which are not capital income in a strict sense (i.e., measurable flows of capital income to private households), as for example central bank profits or earned but not distributed corporate profits. As a consequence, individual market income cannot be aggregated clearly to total national income of the economy (see Kalmbach 1995, Krämer 2011 and Ryan 1996).⁵

Despite these classification problems we compare the development of the profit share taken from National Accounts to changes in the (functional) structure of individual market income and, in a second step, examine the consequences of a rising capital income

⁵ With regard to this issue in particular Kalmbach (1995) questions the adequacy of the labor share as an indicator for income inequality and social welfare. We will focus on this aspect in section 5.

share for the distribution of (market) income among individuals.⁶ Thereby, individual market income is approximated by the sum of individual capital income (from leasing and dividends) and individual labor income.

This information is collected in the GSOEP dataset. Information about labor income is taken from the variable `I11110`, which represents individual labor earnings (including job-related extra payments such as Christmas bonus and profit-sharing income) for both employees and self-employed. In our calculations capital income is the sum of two components: the variable `DIVDY`, which represents income from interest and dividends, and the variable `RENTY`, which represents income from rental and leasing.⁷ Note that capital income variables are only available at the household level. To calculate individual capital shares, we therefore divide household capital income by the number of adult persons or respectively the number of persons that yield positive labor income within the respective household.⁸

In order to compare the profit share from National Accounts (in which labor income of the self-employed is categorized as capital income) to GSOEP micro data, we first summarize capital income of all people and labor income of the self-employed to aggregate capital income. Hence, the *capital income share* is derived as the ratio of this aggregated capital income divided by total market income, which is the sum of the individual market incomes within the population. The composition of the capital income share is illustrated in (1).

$$\text{Capital income share} = \frac{\text{Total capital income} + \text{Labor income self-employed}}{\text{Total market income}} \quad (1)$$

⁶ Although the concept of disposable income plays a central role in inequality research we focus on market income. The question of adequacy of market income in contrast to measures of disposable income in this context is addressed in Ryan (1996: 111).

⁷ For a detailed documentation of the GSOEP variables see Grabka (2010).

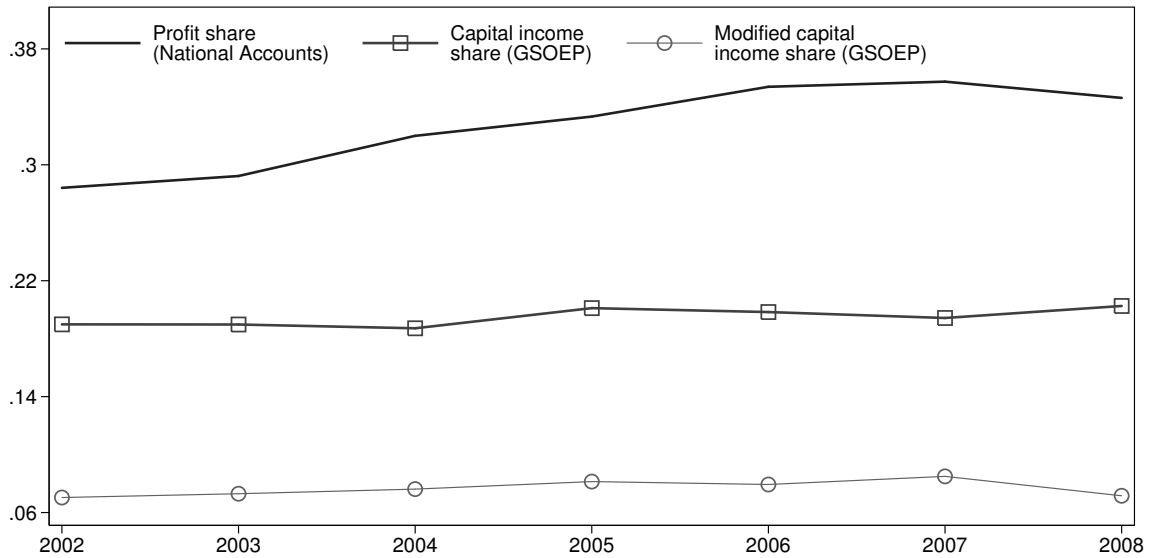
⁸ Note that in the following we use the terms capital income as well as labor income always with reference to the earnings of individuals. Complementary analysis may focus on household income and income calculated on the basis of needs-adjusted equivalence scales.

In addition to this, we calculate a *modified capital income share*, in which the income of self-employed persons is classified in the same way as labor income of employees. Hence, the modified capital income share differs from the concept used in National Accounts. However, for our purpose of examining the interplay of functional and personal aspects of the distribution of income the modified capital share provides a better starting point.⁹ The modified capital income share is illustrated in (2).

$$\text{Modified capital income share} = \frac{\text{Total capital income}}{\text{Total market income}} \quad (2)$$

Figure 2 contrasts the development of capital income shares based on GSOEP micro data with the profit share provided by National Accounts. Year on year changes and cumulative changes are presented in table 1.

Figure 2: Profit Share (National Accounts) and Capital Income Shares (GSOEP).



Source: German Federal Statistical Office (2011), GENESIS-Database, GSOEP, own calculations.

The three series differ considerably in their levels. Over the years, the National Accounts profit share is around 33 percent on average, whereas the GSOEP capital share is about 19 percent. The GSOEP modified capital share is about 8 percent.

⁹ With regard to the comparison of different social groups the special classification of the labor earnings of the self-employed cannot be considered anyway.

Table 1: Profit Share (National Accounts) and Capital Income Shares (GSOEP).

	Profit Share			Capital Income Share			Modified Capital Share		
	Level	$\Delta\%$	$\Sigma\Delta$	Level	$\Delta\%$	$\Sigma\Delta$	Level	$\Delta\%$	$\Sigma\Delta$
2002	28.4			19.0			7.0		
2003	29.2	2.8	2.8	19.0	0.0	0.0	7.3	3.7	3.7
2004	32.0	9.6	12.4	18.7	-1.4	-1.4	7.6	4.5	8.1
2005	33.3	4.1	16.5	20.1	7.4	6.0	8.1	6.8	15.0
2006	35.3	6.0	22.5	19.8	-1.4	4.6	7.9	-2.5	12.5
2007	<u>35.7</u>	1.1	<u>23.6</u>	19.4	-2.0	2.6	<u>8.5</u>	7.0	<u>19.5</u>
2008	34.6	-3.1	20.5	<u>20.3</u>	4.3	<u>6.8</u>	7.2	-15.8	3.7

$\Delta\%$: Year-on-year percentage changes.

$\Sigma\Delta$: Cumulative percentage changes.

Source: German Federal Statistical Office (2011), GENESIS-Database, GSOEP, own calculations.

Besides the intricacies already mentioned above, one can think of two dominant factors in order to explain the discrepancy between the GSOEP capital shares and the National Accounts profit share.

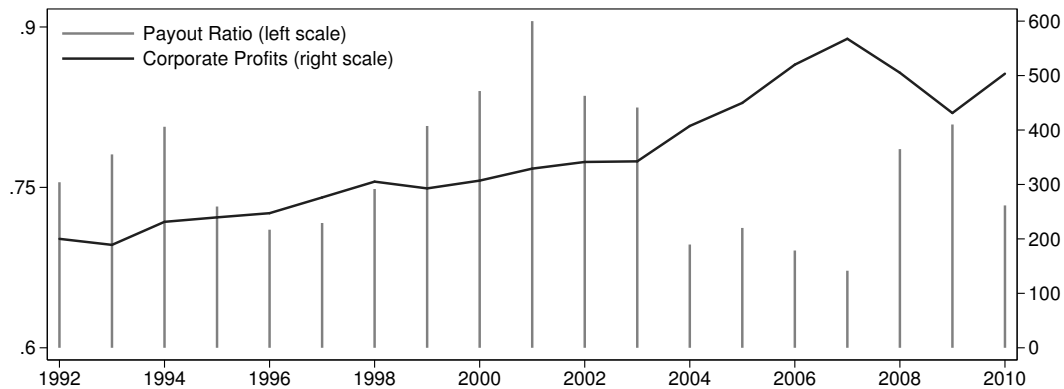
First, there is a pronounced gap between gained and distributed profits of German companies. Figure 3 illustrates the development of corporate profits (right scale) and the payout ratio. In particular within the years 2004 to 2007 we observe a distinct increase of profits as well as a falling payout ratio, reflecting a comparably constant payout level. Depending on the concentration of company stock holdings within the population (see IAW 2012), this development may be associated with a rising concentration of market income as undistributed profits imply an increase of business assets and are likely to involve rising capital income of stock holders in the future.

A second explanation for the discrepancy between National Accounts and GSOEP data might be the underestimation of income and wealth data and in particular financial assets and capital income in household surveys due to the exclusion of very wealthy and high income households. Moreover, survey data exhibit subjective valuation of individuals that tend to report their respective wealth and capital income situation rather cautious (see, e.g., Ammermüller et al. 2005).¹⁰

Next to the levels, we examine the relative evolution of the three series within the time-span of the years 2002 to 2007. Here we see that an increase of the capital income

¹⁰ However, due to the availability of the income data from the high-income sample within the GSOEP since 2002, the underestimation of capital income in household surveys should have been reduced, compared to collected before 2002.

Figure 3: Corporate Profits and Payout Ratio.



Source: German Federal Statistical Office (2011), own calculations.

share can also be found in the GSOEP data. The GSOEP capital income share rose from 19.0 percent in 2002 up to 20.1 percent in 2005. In contrast to the National Accounts profit share, it slightly declined already in 2006 but rose up again to 20.3 percent in 2008.¹¹ Moreover, compared to the National Accounts profit share the increase of the GSOEP capital income share is less pronounced. In contrast to this the modified capital income share has increased by almost one fifth from 7.0 percent in 2002 to 8.5 percent in 2007. Like the National Accounts profit share the GSOEP modified capital share reaches its minimum level in 2002 and its peak in 2007. Moreover, the relative changes of these two series are quite similar.

Hence, despite being constructed according to the concept of National Account Statistics, the evolution of the GSOEP capital income share is much less similar to the National Accounts profit share than is the GSOEP modified capital share. Thereby, the different evolution of the two GSOEP capital income shares reflects a diminishing role of the labor income of the self-employed relative to total market income. As the relative amount of the self-employed in the GSOEP dataset does not vary considerably within 2002-2008 (roughly 5 to 5.7 percent), this can hardly be ascribed to a changing relative amount of self-employed people but is rather due to a decrease of their average labor earnings (see also IAW 2012).

¹¹ Thereby, the decline from 2005 onwards reflects the relative rise of the labor income share due to the economic upswing from 2005 to 2007 and its positive effects upon the labor market.

According to this the GSOEP micro data do not sustain the view that the increase of the profit share in macro data may have partly been driven by rising labor income of the self-employed. A rising profit share in National Accounts rather indicates a structural shift within the average composition of individual market income. And this is exactly what the increase of the modified capital share suggests.

5 Conceptual Links of Capital Income Shares and the Distribution of Market Income

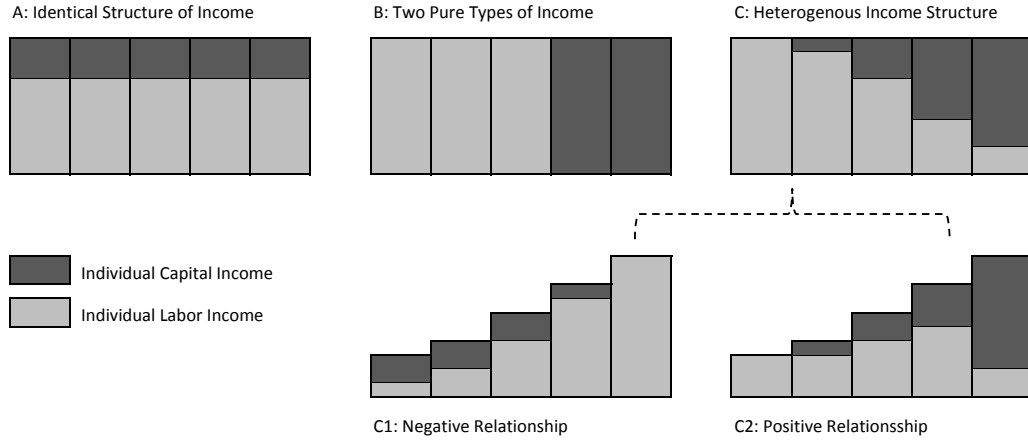
In the remainder of our paper we will address the implications of changing capital shares for the concentration of market income. How a rising capital income share transmits into the distribution of individual market income depends (1) on the concentration of capital income and (2) on the relationship between the share of capital income and the level of market income.¹² Figure 4 (upper panel) illustrates the first aspect via three cases of concentration (A, B, C). The boxes represent the income structure of individuals.

- Case A assumes an identical income structure of all individuals. Here, changes in the functional distribution of income do not alter the personal distribution of income.
- Case B contrasts two extreme types of income structure. Individuals are supposed to exclusively earn labor or capital income. Changes in the functional distribution of income lead to strong changes in the personal distribution of income.
- Case C combines the rather extreme setups A and B. Here, the (as we will see below more realistic) assumption is that individuals gain both, labor income and income from asset flows. However, the respective shares differ among individuals.¹³

¹² A similar idea has been presented by Kalmbach (1995: 283ff) as the so-called *Ricardo Matrix*, a kind of theoretical reference setup clearly allocating income from wages, profits and rents to workers, capitalists and rentiers. Kalmbach refers to an empirical assessment of this categorization by Bedau (1993, 1994) and to the phenomenon of a rather mixed income allocation highlighted by Stobbe (1962). We thank Hagen Krämer for drawing our attention upon this literature.

¹³ The need for a more realistic classification of profit and labor income, not just contrasting two pure groups of actors, and its relevance for the impact of changing factor shares upon the personal distribution of income is also mentioned by Glyn (2009: 102).

Figure 4: Types of the Functional Distribution of Income.



Within each panel each of the five boxes on the horizontal axis represents the income structure of an individual. The five individuals within each of the five panels constitute the income structure of artificial populations. In contrast to the upper panels, that only focus on the structure of income, within the lower panels the height of the boxes reflects different levels of market income.

Source: Own illustration.

Besides this aspect, one has to take into account the relationship between the level of individual market income and the share of capital income. The lower panel of figure 4 therefore contrasts two possible cases (both special cases of C).

- From a negative relationship between the level of individual market income and the respective share of capital income (case C1), one would expect a declining concentration of market income among individuals resulting from a rise in the average share of capital income.
- In contrast to this, in case of a positive relationship (case C2), one would expect rising capital income shares to cause an increase in the concentration of individual market income.

6 Distribution of Capital Income Shares Among Social Groups

In what follows, these theoretical considerations will be examined empirically on the basis of micro data taken from the GSOEP (see figures 5 and 7). Thereby, both relationships

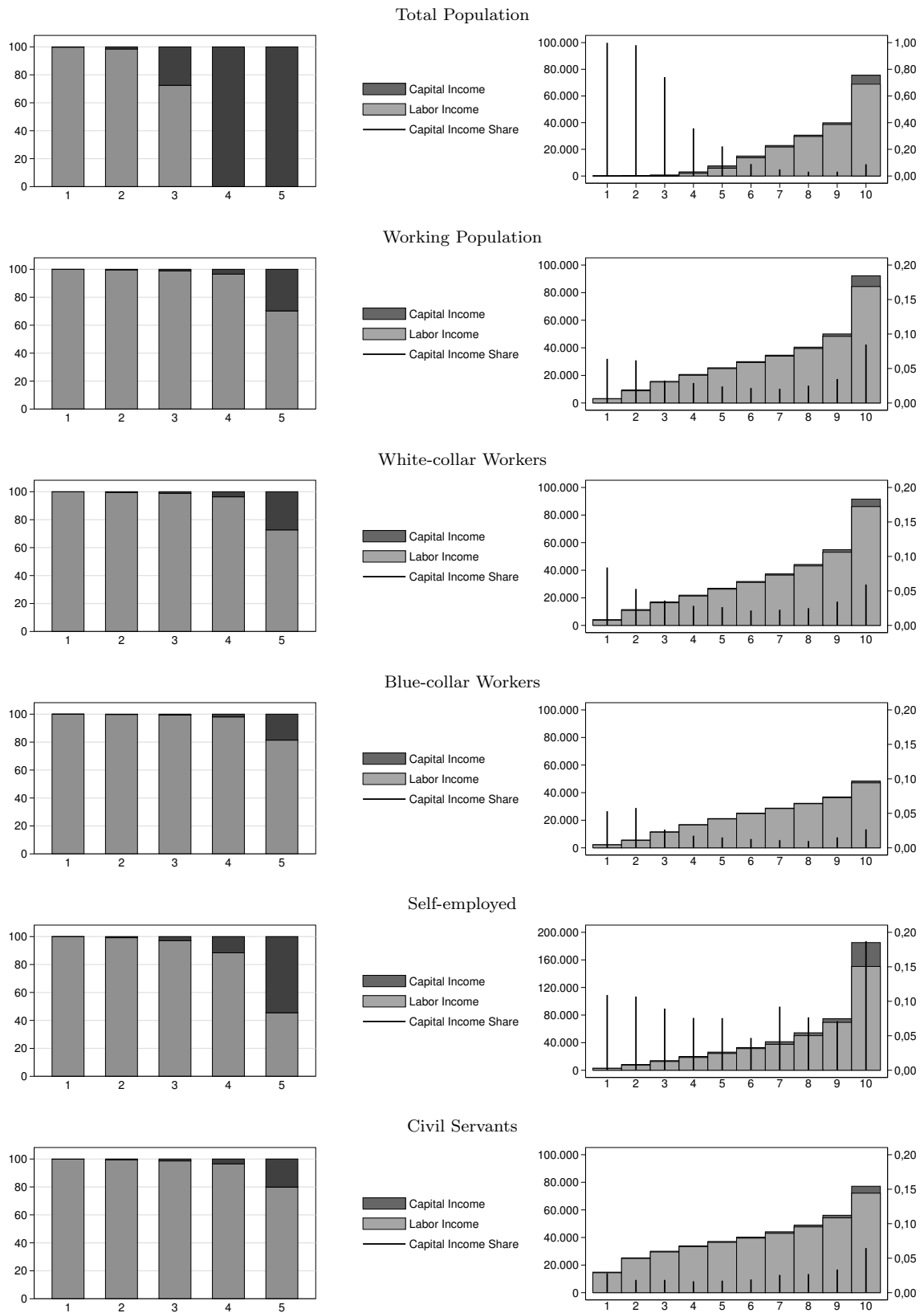
illustrated in figure 4 will be presented for the entire population, the working population, white-collar employees and blue-collar employees as well as for self-employed people and civil servants.

The left panels of figure 5 approximate the first theoretical relationship presented in figure 4. Here, the average capital income share (vertical axis) is sorted by the respective shares of capital income (horizontal axis, quintile categorization). Complementarily, we report the labor income share. Both shares sum up to 100 percent. Note that this representation does not consider the level of individual market income and therefore only addresses the aspect of income structure heterogeneity. As one can see, the empirical picture resembles the heterogenous income structure (case C) presented in figure 4. Within the whole population (upper left panel) the concentration of capital income is higher than within the working population and its subgroups. This is due to a considerable amount of people that live on transfer payments such as pensioners and unemployed persons. These subpopulations gain zero or only little labor income, so that even a low capital income yields a high capital income share. Within the working population, civil servants as well as blue-collar workers are characterized by a comparably low concentration of capital income in contrast to white-collar workers and the self-employed.

The right panels of figure 5 illustrate the structural composition of individual market income in absolute levels (left scale) as well as the share of capital income (right scale) sorted by the level of individual market income (horizontal axis, decile categorization). This approximation corresponds to the second theoretical relationship presented in figure 4 (lower panel).

Considering the overall population, a low market income is associated with a high capital income share. As the lower part of the market income distribution mainly consists of pensioners and unemployed persons, this is little surprising. As a consequence, for the overall population the capital income share steadily decreases up to the eighth decile group.

Figure 5: Capital Income Share and Level of Market Income



Note that the ranges (scaling of the axis) are identical for all panels, except in two cases within the right panels: the capital share (right axis) for the whole population ranges from 0 to 100 percent. In any other cases the maximum capital share is set to 20 percent. Further, the level of income (left axis) ranges from 0 to 100,000 Euros except in case of the self-employed. Here, the range goes up to 200,000 Euros.

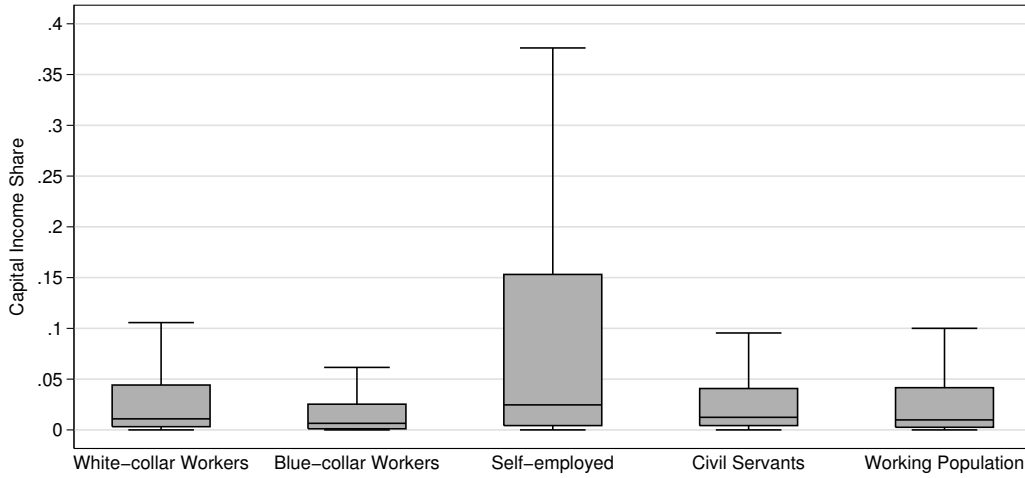
Source: GSOEP, own calculations.

However, the situation is different with regard to the working population. We observe a weak U-shaped relationship between the relative market income position (measured in deciles) and the capital income share: For a low labor income - at the left margin of the income distribution - even small levels of capital income lead to a relatively elevated capital income share. Towards the middle of the income distribution absolute capital income stagnates or only grows at low rates, while labor income increases at a much higher rate. This relation inverts in the upper half of the income distribution, where moving to the next decile group is associated with a higher percentage increase in capital income than in labor income. Hence, the capital income share has its minimum in the middle of the income distribution.

Within the group of white-collar workers the capital income share is lowest for the sixth decile group. The same holds for the subpopulation of the self-employed. For blue-collar workers the turning point is the eighth decile group, whereas for civil servants the smallest capital income share is in the fourth decile group. Regarding levels, the capital income share clearly is highest for the self-employed - it is about twice as high as the mean of the working population. In contrast, civil servants and blue-collar workers exhibit capital income shares slightly below the mean of the working population.

As the boxplot in figure 6 shows, differences with regard to the capital income share are rather small within the different groups of the working population (except the self-employed). In particular within the group of civil servants and blue-collar workers the capital income share is close to the respective subpopulation's mean for most decile groups. In contrast to this, the self-employed show comparably strong heterogeneity with regard to the capital income share of different decile groups. This is not only due to the high variance of the level of capital income but also due to pronounced differences with regard to the level of labor income. We will address this aspect also in figure 7 with regard to income concentration.

Figure 6: Capital Income Shares within Different Social Groups



Source: GSOEP, own calculations.

7 Capital Income Shares and Concentration of Market Income

Next, we focus on the development of capital income shares and changes of the concentration of market income over time. Again, we examine the time-span of the years 2002 to 2008 and compare different social groups. Figure 7 therefore illustrates the capital income shares on the horizontal axis. The concentration of market income measured by GINI indices is reported on the vertical axis. The centered panel presents a comparison of the four subpopulations within the working population, whereas the subpanels below offer a more detailed representation illustrating the respective changes of capital income shares and market incomes' concentrations over time.

We observe that the four subpopulations are characterized by considerable differences regarding average capital income shares and the concentration of market income (centered panel). In general, a higher average capital income share implies a stronger concentration of market income. This not only holds for the development within each group over time but also for the comparison between groups.¹⁴ For white-collar workers (upper left sub-

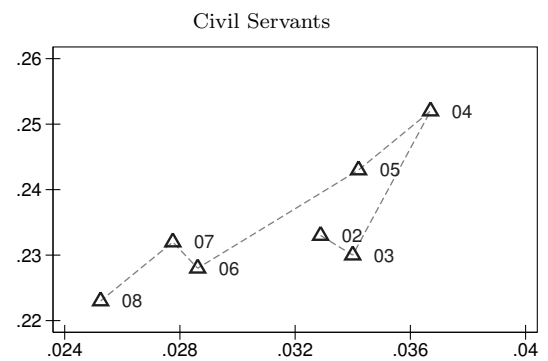
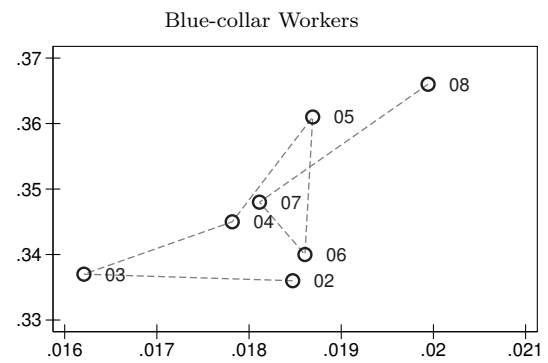
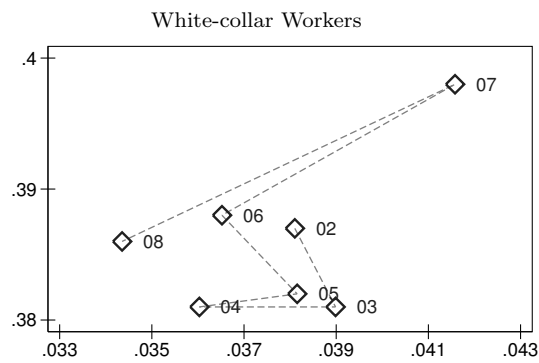
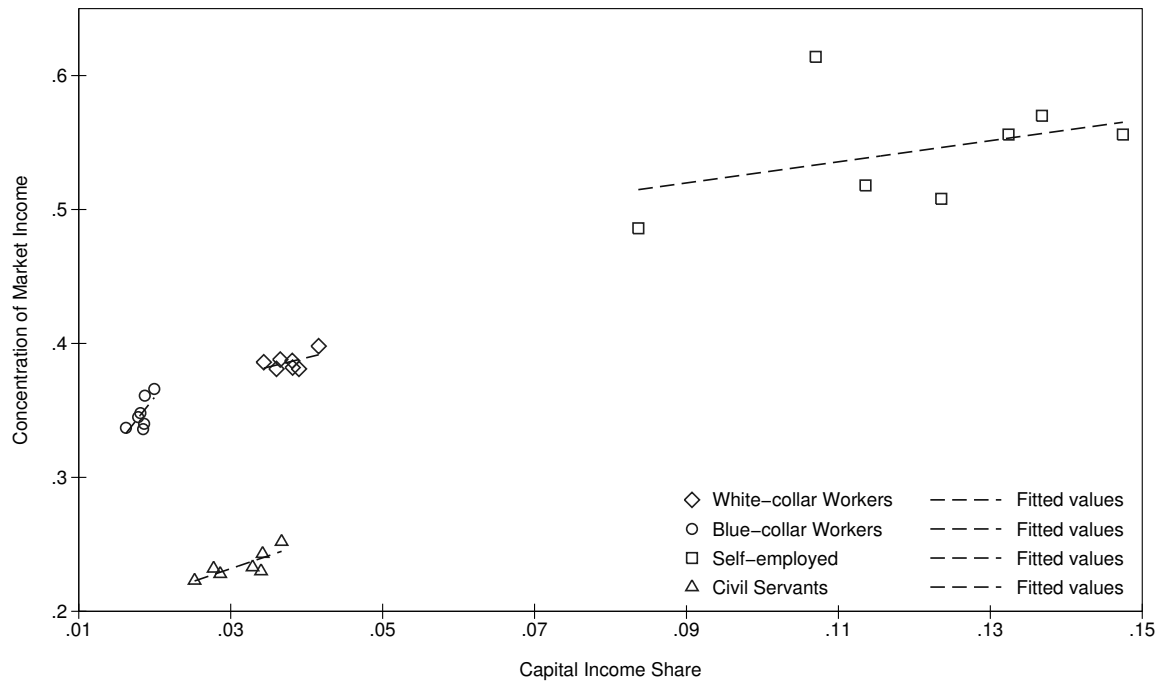
¹⁴ Note that this phenomenon is closely connected to the differences of the concentration of wealth among social groups. For an analysis of the joint distribution of income and wealth among social groups see IAW (2012).

panel) we observe a concentration peak in 2007, but a clear decline in 2008. Within the group of blue-collar workers (upper right sub-panel) - except the changes from 2002 to 2003 - the concentration of market income clearly follows the changes of capital income shares.

For the self-employed we observe a pronounced rise of the average capital income share, peaking in 2007 (lower left sub-panel). As already illustrated in figures 5 and 6, this group is characterized by the highest capital income shares. From 2002 to 2007 rising capital income shares go along with increasing concentration of market income. However, the further increase of the GINI coefficient from 2007 to 2008 is remarkable as shares (and levels) of capital income (as well as the concentration of capital income) fall at this time.

Civil servants' capital income shares (and levels) are comparable to white-collar workers and are slightly below but very close to the average of the whole working population (lower right sub-panel). In contrast to other groups, civil servants' capital income shares (and levels) peak in 2004 and decline steadily afterwards. Thereby, again, the concentration of market income follows the development of the respective capital income shares.

Figure 7: Capital Income Share and Concentration of Market Income



Note that white-collar workers account for 51 percent, blue-collar workers for 33 percent, self-employed persons represent about 10 percent and civil servants approximately 6 percent of the entire working population. Moreover, the relative size of the different groups is nearly constant over the observed time-span.

Source: GSOEP, own calculations.

8 Conclusion

Our analysis offers three main results. First, we find that the increase of the profit share that is reported in National Accounts is also evident in the GSOEP micro data. Due to undistributed profits as well as the various sources of underestimation of average capital income within household surveys, the level of the GSOEP capital share is far below the National Accounts profit share. However, its relative increase is comparable to the changes of the profit share, reflecting a structural shift within the average individual market income. The observed increase of undistributed profits is likely to imply rising values of business assets and may lead to increasing capital income of stock holders in the future. Given a comparably high concentration of company stock holdings within the population this may result in an increase of the concentration of market income. A more detailed investigation of this kind of flow-stock-flow-nexus may provide further insights into the effects of a rising profit share upon income inequality.

Second, our theoretical considerations that connect changes in the structure of market income to the personal distribution of income provide helpful insights for the discussion and quantitative assessment of changing capital income shares with regard to the concentration of market income. The data suggest rising inequality of market income as a consequence of increasing capital shares on the level of individual market income. From a welfare point of view one may be interested in complementary research that focusses on the concepts of household income as well as income based on needs-adjusted equivalence scales.

Third, we find that rising capital income shares are associated with an increase of the concentration of market income over time. This holds for each subpopulation within the working-population as well as for the comparison of the respective subgroups. While the rise of the capital income share is associated with an increase of the concentration of market income for white-collar and blue-collar workers as well as for the self-employed, the group of civil servants shows declining capital income shares and a decrease of the concentration of market income.

Summary Statistics

Year	Working Population	White-collar Workers	Blue-collar Workers	Self- employed	Civil Servants
GINI Index of Market Income					
2002	0.395	0.387	0.336	0.486	0.233
2003	0.397	0.381	0.337	0.518	0.230
2004	0.397	0.381	0.345	0.508	0.252
2005	0.412	0.382	0.361	0.556	0.243
2006	0.410	0.388	0.340	0.570	0.228
2007	0.413	0.398	0.348	0.556	0.232
2008	0.426	0.386	0.366	0.614	0.223
average	0.407	0.386	0.348	0.544	0.234
GINI Index of Capital Income					
2002	0.874	0.867	0.846	0.825	0.821
2003	0.882	0.857	0.830	0.877	0.810
2004	0.877	0.840	0.850	0.871	0.821
2005	0.887	0.855	0.846	0.884	0.820
2006	0.885	0.845	0.846	0.900	0.777
2007	0.884	0.856	0.844	0.892	0.762
2008	0.880	0.848	0.864	0.875	0.771
average	0.881	0.853	0.846	0.875	0.798
(Modified) Capital Income Share					
2002	0.042	0.038	0.018	0.084	0.033
2003	0.050	0.039	0.016	0.114	0.034
2004	0.047	0.036	0.018	0.124	0.037
2005	0.048	0.038	0.019	0.132	0.034
2006	0.044	0.037	0.019	0.137	0.029
2007	0.044	0.042	0.018	0.147	0.028
2008	0.039	0.034	0.020	0.107	0.025
average	0.045	0.038	0.018	0.121	0.031
Average Level of Capital Income					
2002	1308	1343	440	4039	1402
2003	1433	1349	382	5235	1421
2004	1392	1211	412	5195	1566
2005	1538	1305	429	6168	1384
2006	1504	1232	422	5895	1150
2007	1567	1400	403	6467	1084
2008	1312	1125	426	5419	955
average	1436	1281	416	5488	1280

Levels of Capital Income reported in Euro (prices of 2005).

Source: GSOEP, own calculations.

References

- Ammermüller, A.; Weber, A.M.; Westerheide, P. (2005): Die Entwicklung und Verteilung des Vermögens privater Haushalte unter besonderer Berücksichtigung des Produktivvermögens. Abschlussbericht zum Forschungsauftrag des Bundesministeriums für Gesundheit und Soziale Sicherung. Center for European Economic Research (ZEW), Mannheim.
- Aretz, B.; Busl, C.; Gürtzgen, N.; Hogrefe, J.; Kappler, M.; Steffes, S.; Westerheide, P. (2009): "Ursachenanalyse der Verschiebung in der funktionalen Einkommensverteilung in Deutschland". Center for European Economic Research (ZEW), Mannheim.
- Becker, I.; Hauser, R. (1998): Die langfristige Entwicklung der personellen Einkommensverteilung in der Bundesrepublik Deutschland. In: Galler, H.P.; Wagner, G. (Hrsg.): Empirische Forschung und wirtschaftspolitische Beratung: Festschrift für Hans-Jürgen Krupp. Frankfurt [u.a.]: Campus Verlag, 119-134.
- Bedau, K.-D. (1993): Die Einkommensverteilung nach Haushaltsgruppen in Deutschland seit Mitte der achtziger Jahre. *Vierteljahreshefte zur Wirtschaftsforschung*, 3/4:150-171.
- Bedau, K.-D. (1994): Das Einkommen sozialer Haushaltsgruppen in Westdeutschland im Jahre 1992. *German Institute for Economic Research (DIW) Wochenbericht*, 45/94:769-778, Berlin.
- Dauderstädt, M. (2010): Europas unterschätzte Ungleichheit. *WISO direkt*, 09/2010.
- Goldfarb, R.S.; Leonard, T.C. (2005): Inequality of What Among Whom? Rival Conceptions of Distribution in the 20th Century. *Research in the History of Economic Thought and Methodology*, 23a:79-123.
- Glyn, A. (2009): Functional Distribution and Inequality. *Oxford Handbook of Economic Inequality*, 101-126, Oxford.
- Grabka, M. (2010): Codebook for the \$PEQUIV File 1984-2009 CNEF Variables with Extended Income Information for the SOEP. German Institute for Economic Research (DIW), Berlin.
- Horn, G.; Logeay, C.; Zwiener, R. (2008): Wer profitiert vom Aufschwung? *Macroeconomic Policy Institute (IMK) Report*, No.27, Düsseldorf.
- Horn, G.; Dröge, K.; Sturn, S.; van Treeck, T.; Zwiener, R. (2009): Von der Finanzkrise zur Weltwirtschaftskrise (III). Die Rolle der Ungleichheit, *Macroeconomic Policy Report (IMK) Report*, No.41, Düsseldorf.
- IAW (2012): Aktualisierung der Berichterstattung über die Verteilung von Einkommen und Vermögen in Deutschland. Gutachten für das Bundesministerium für Arbeit und Soziales. Institute for Applied Economic Research (IAW), Tübingen.
- Kalmbach, P. (1995): Die Entwicklung der Lohnquote und die Entwicklung der Einkommensverteilung. In: *Hamburger Jahrbuch für Wirtschafts- und Gesellschaftspolitik*, 40:273-289.

- Krämer, H. (2010): The Alleged Stability of the Labour Share of Income in Macroeconomic Theories of Income Distribution. *Macroeconomic Policy Institute (IMK) Working Paper*, 11/2010, Düsseldorf.
- Krämer, H. (2011): Die Entwicklung der funktionalen Einkommensverteilung und ihrer Einflussfaktoren in ausgewählten Industrieländern 1960-2010. *Macroeconomic Policy Institute (IMK) Study*, 1/2011, Düsseldorf.
- Krupp, H.-J. (1967): "Personelle" und "funktionelle" Einkommensverteilung. *Jahrbücher für Nationalökonomie und Statistik*, 180:1-35.
- Rodrik, D. (2007): How to save Globalization from its Cheerleaders. *The Journal of International Trade and Diplomacy*, 1(2):1-33.
- Ryan, P. (1996): Factor Shares and Inequality in the UK. *Oxford Review of Economic Policy*, 12(1):106-126.
- Schäfer, C. (2010): Zukunftsgefährdung statt Krisenlehren. *WSI-Verteilungsbericht 2010*, 636-645.
- Stobbe, A. (1962): Untersuchungen zur makroökonomischen Theorie der Einkommensverteilung. Tübingen.