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Redistributive Impacts of Government and Private Household Activities. Trends in Equivalized Household Net Incomes and Intra-household Earnings in Germany, 1985–2005

*Peter Krause**

The paper examines the development of incomes in Germany at different welfare levels, together with current trends in poverty. The analyses are based on data from the German Socio-Economic Panel (SOEP) study, which provides detailed annual information on incomes starting in the mid-1980s. Results show that increased inequality is mainly in pre-governmental income and thus not primarily the result of diminishing redistribution measures by the government. The results also indicate that the increasing labor market inequality is further intensified by decreasing redistributive activities of private households. Intra-household earnings analyses reveal that despite rising female labor market participation, intra-household inequality has remained remarkably stable. Earnings profiles between male and female household heads are now much more multifaceted than before, which might be regarded as a dynamic intra-household strategy of protection against growing market risks.

JEL classifications: D13, D31, H24, I31

Keywords: income distribution, poverty, inequality, redistribution by government and households, intra-household earnings ratios

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I. *Motivation*

Over the last two decades, Germany has seen a dramatic increase in income inequality. The gap between rich and poor is higher now, halfway through the new decade, than anytime from the mid-eighties to the late nineties. In the last five years, the poverty risk has increased dramatically as well (Goebel et al. 2007, Krause/Ritz 2006). Some social policy critics have attributed this development to shifts in the welfare system towards a more (neo-) liberal market orientation, following the typology outlined by Esping-Andersen (Esping-Andersen 1990, Goodin et al. 1999).

In the first part of the present article, income developments and risk-of-poverty-rates in Germany are examined over the last two decades: we observe in absolute developments a stagnation in real income levels together with relative trends in rising income inequality and increasing risks of poverty. Our results for the years 1985 to 1991 refer only to the former West German population, and from 1992 on to Germany as a whole, after unification. As the East and West German income distributions differ substantially, the process of convergence in income levels between East and West after unification is monitored as well.

Rising income inequality is usually attributed to decreasing government redistribution measures, increasing unemployment rates, and rising wage gaps induced by the labor market. The reasons for increasing inequality are examined here in greater detail, separating the effects of individual participation in the labor market from social policy effects, aggregated at the household level. The differentiation between the individual and household level reveals a missing link that has not yet been adequately considered in the social policy discussion on inequality (Ludwig-Mayerhofer 2006, Ludwig-Mayerhofer et al. 2006): the redistributive impact of shared living and care activities by members of a household. The quantitative effect of redistribution within the household through the sharing of resources and consumption in everyday life should not be underestimated, and we show here that it is by no means smaller than the effects of government social policy.

Earning relations within the household are therefore investigated in greater detail. Our argument takes its starting point in the »pool assumption« of equivalent incomes usually used in economic welfare and poverty research, which assumes perfect redistribution of available income resources among all household members according to their individual needs.¹ Here, differences in equivalence scales take account of differing needs between adults and children. This assumption, however, has been challenged by several authors on

1 Equivalence weights are used to equalize household incomes for households of different sizes (and ages) according to their needs. When equalized household incomes are related to individuals – as is the case for standard analyses on economic welfare and poverty – all individuals within the household receive the same value as an expression of their common economic welfare level and individual ranking. This aspect includes the assumption of perfect redistribution between all household members according to their individual needs. In case of poverty, this so-called »pool assumption« means that all available resources are distributed within the household such that either all or none of the household members lies below the poverty line.

the basis that it ignores gender differences, since despite increasing labor market participation, women have still lower earnings than men and might therefore also have limited access to the common household budget (Jenkins 1991, Davies/Joshi 1994, Lundberg et al. 1997, Lee 1999, Hill 2004, Bonke 2006).

Thus, we assert that intra-household earnings are a source of power by which some household members may exert control over the household budget, and that this power may be distributed unequally (Pahl 1983 and 1995). The usual measure of this is the gender ratio (the female-to-male earnings ratio), which also reflects the female labor market participation rate (Bonke/Browning 2003). However, this rate is not identical with intra-household inequality, so we have introduced a new indicator that links back to the discussion on rising inequality. In the empirical analyses presented here, we therefore monitor the long-term development of both of these intra-household effects – gender ratio and intra-household inequality – in Germany. Finally, we examine intra-household earnings arrangements for variations in different welfare levels and changing household types across the life course.

2. Database, Indicators and Measures

2.1 Database and Population

The empirical analyses are based on data from the German Socio-Economic Panel (SOEP). The SOEP is a multidisciplinary representative longitudinal study in Germany starting in 1984 where each individual living in the household is surveyed annually. The SOEP was expanded to include the East German population immediately after unification in 1990. In 2005 the SOEP had more than 22,000 individual respondents living in about 12,000 households. The person who knows all the concerns of the household best responds to the household questionnaire, which includes the main questions about the household as a whole. SOEP is also based on individual questionnaires that are given to every member of the household from the age of 17 years up. With this database, we are also able to monitor intra-household arrangements along with other developments over time. For the main indicators studied here, we look at developments over the last 20 years, from 1985 to 2005. All annual incomes before 1992 refer to West Germany only.

Our empirical analyses on income development are based on the total population: not just private households, but also individuals living in private households. Further analyses cover couples only, and in some cases only individuals of potential working age (16 to 74 years).²

2.2 Couples and Composition of Households

Our comparative analysis of couples deals with the relationship between male and female household heads, whom we assume to make the central decisions concerning the living

² The potential working age up to 74 years is derived from International Labour Organisation (ILO) suggestions (Goebel et al. 2005).

conditions of all other household members. The context of the household is defined by all household members who live together, regardless of whether or not they are married or directly related. In this sense, our concept of household corresponds to the original meaning of the Latin *familia*, which also included non-relatives. We then differentiate children according to their age as young children, teenagers, and adults still living with their parents. The residual group »others« may include non-relatives living as an apartment-sharing community, dependent parents or grandparents together with their children.

We then use this grouping of household members further to derive household typologies that characterize the different modes of living together across the life cycle: we differentiate between households with one or two partners and between households with and without children. The age differentiation is determined by the primary household head: 16 to 34 years is regarded as the period of finishing education and beginning the first job, 35 to 54 years is the period of prime working age, 55 to 74 years is the final working period, potentially covering early retirement, reduced working hours, and casual labor market participation up to and after the beginning of retirement. At the age of 75 years, the last period in the life cycle begins. This age differentiation is applied to both single households and partner households. Households with children form a separate situation depending on the number and age of the children, and whether the household is headed by two parents or a lone parent.

2.3 Income Indicators at Household and Individual Level and Poverty Measures

The economic well-being of the households is usually quantified by their annual household net income, equivalized according to the new OECD scale.³ In addition to this post-governmental income measure, pre-governmental household incomes⁴ with and without pensions and household labor incomes are also used on the household level. Household labor incomes are aggregated from the individual annual earnings, which are used to describe intra-household income arrangements. All annual incomes here refer to the previous year and are expressed in euros (at constant prices of 2000).

We pay special attention to the low-income area. Following the EU standards, the relative income poverty line is defined as 60 percent of median equivalized (post-governmental) household net income (Guio 2005).⁵ Poverty is therefore always attributed equally to all household members.

3 The terms welfare levels, economic well-being, equivalent household net income, and post-governmental equivalent income are used here interchangeably.

4 Pre-government incomes include labor earnings, flows from assets, private retirement incomes and private transfers (earnings are the major part) – without taxes and social transfers, aggregated in the household.

5 The EU standard was developed within the Lisbon process, when (Laeken) indicators were defined to combat social exclusion. The first indicator which results from the 60 percent median threshold is regarded as »risk-of-poverty rate«, indicating that income deprivation is embedded in a multidimensional framework of poverty.

At the individual level, low incomes are defined according to the International Labour Organisation (ILO) criteria as less than two thirds of the median for all positive individual gross earnings (Goebel et al. 2005). It should be kept in mind that having low individual earnings is not necessarily an indicator of being poor, since even low earnings often provide additional income that increases the household's overall welfare level. Low-income jobs have two sides: on the one hand, they are enforced by diminished duration of job contracts and job security, and on the other, they may also act as a form of »training« allowing people to stay active on the labor market.

Individual annual earnings serve as the main indicator for intra-household earnings ratios between male and female household heads. Earnings are expressed in constant prices. The income ratios between male and female heads are further broken down by household types across the life cycle (as mentioned above) and by welfare levels of household income to identify differences between rich and poor.

2.4 Coefficients of Intra-household Inequality and Female-to-male Earnings Ratios

The empirical intra-household analyses presented in the following deal mainly with earnings ratios between male and female household heads. To characterize these relationships, two kinds of related coefficients are used.

The first is the gender ratio (1), used to obtain information on which of the two partners is better off, focusing on the female part in both partner values. This female-to-(female+male)-ratio ($f2fm$) has the range zero to one: zero means that the female head has nothing and the male head takes all, one means that the female head takes all, and 0.5 means both partners have the same values.

Coefficient of female-to-male ratio for couples:

$$f2fm = \frac{y_{Head_f}}{y_{Head_m} + y_{Head_f}} \quad \text{with } f2fm \in [0, 1], \text{ for } (y_{Head_m} + y_{Head_f}) > 0$$

The second is the Gini coefficient, which indicates the inequality between partners. The Gini coefficient (2) is used because it is one of the most commonly used indices of income inequality and allows inclusion of zero values (as long as the total is greater than zero). However, since the Gini coefficient for large samples ranges only between zero and one, for the two-person relationship we normalized the Gini coefficient (3). Applied to the ratio between male and female household heads, this measure simply indicates the absolute difference between both partners in relation to the sum of both partners (4): if both partners earn the same amount, the coefficient indicates zero as no inequality, if one partner takes all, the value is one.

Gini coefficient:

$$G = \left[\frac{1}{2n^2\mu} \right] \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j| \quad \text{with } G \in [0, n(n-1)], \text{ for } y_{ij} \geq 0$$

Normalized Gini coefficient:

$$G^* = \left[\frac{n}{n-1} \right] G \quad \text{with } G^* \in [0,1], \text{ for } y_{ij} \geq 0$$

Normalized intra-household Gini coefficient between partners:

$$G_{Part}^* = \frac{|y_{Head_m} - y_{Head_f}|}{y_{Head_m} + y_{Head_f}} \quad \text{with } G_{Part}^* \in [0,1], \text{ for } (y_{Head_m} + y_{Head_f}) > 0$$

The intra-household Gini coefficient measures the inequality between male and female heads.

Both indices, the gender ratio (f2fm) and the intra-household Gini coefficient, are now used for describing the individual earning ratio for couples. However, it is necessary to keep in mind that this measure is not defined if both partners receive no individual earnings.⁶ For both indices, the percentage presentation is used with ranges from zero to 100 instead of the zero to one range.

3. Development of Household Net Income and Poverty

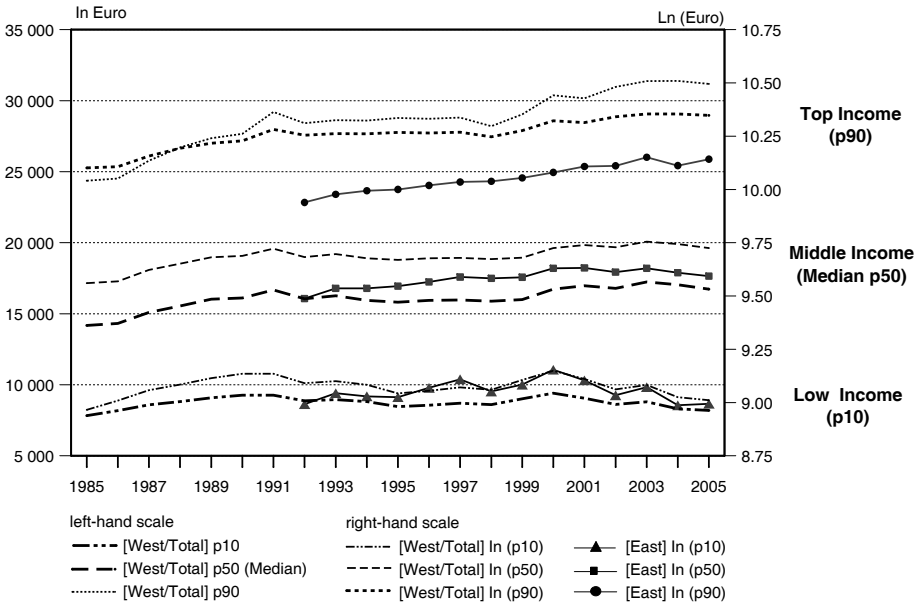
3.1 Income Development at Different Welfare Levels

The performance of the German economy has been rather low over the last decade: real incomes have hardly changed, while inequality together with the risk of poverty has been rising. By monitoring the real income thresholds at different welfare levels over time, these absolute as well as relative income developments can be examined simultaneously (Goebel et al. 2006). Absolute income developments are captured by fixed income thresholds for low (p10), middle (p50), and high (p90) income levels, separating the poorest ten percent, the midpoint of the population (median), and the richest ten percent from the rest of the population (figure 1). The logarithms of the income thresholds (right scale) are taken to ensure that the thresholds for the different levels are reproduced in correct proportion to each other (the underlying real original thresholds in euros are also included, left scale). The distance between the thresholds indicates the degree of inequality: the higher the difference between low and high-income thresholds, the higher the extent of inequality.

The median level (p50) of real equivalized household net incomes increased in the last half of the 1980s in Western Germany. After unification in 1990, real income levels – now for Germany as a whole – remained almost unchanged up to the end of the 1990s, and increased again at the beginning of the new decennium with some reductions since 2003. The absolute purchasing power of the middle-income group has therefore barely increased since unification.

⁶ For both indices only the direct comparisons between both partners are considered without regarding the absolute welfare level.

Figure 1: Income Development at Different Welfare Levels, Germany, 1985–2005



Note: Income thresholds p50 (Median) divides the total population in two halves with higher and lower incomes. p10/p90: income thresholds, separating the poorest / richest 10% of the population. Annual incomes (previous year), deflated; household incomes equivalized according to new OECD scale; 1985-1991: West Germany.

Source: SOEP

The poor population at the bottom (p10) also enjoyed increasing welfare levels at the end of the 1980s, but after unification, their incomes fell and have decreased steadily over the last few years. The purchasing power of low-income groups was therefore even lower in 2005 than about ten years before.

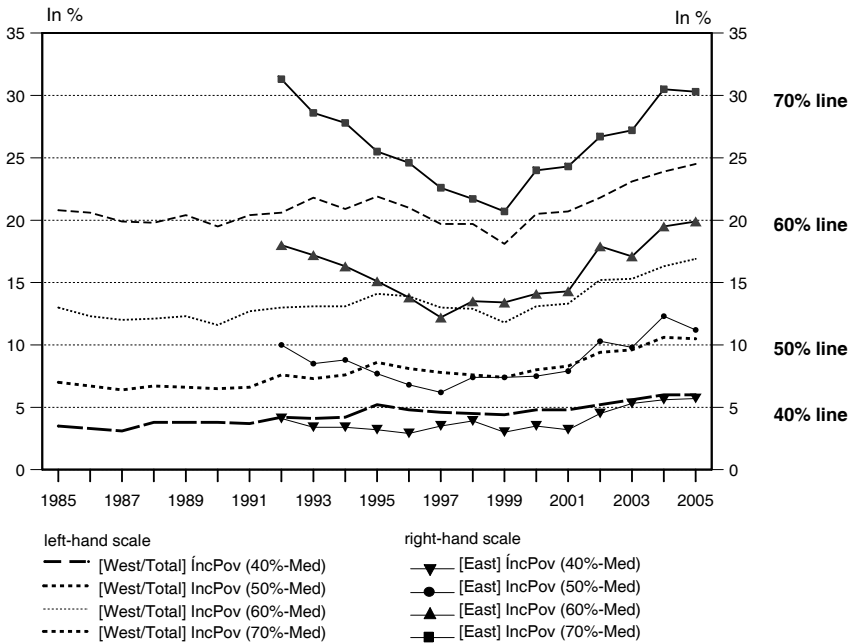
The rich population at the top (p90) also enjoyed increasing incomes up to the end of the eighties. After 1990, the high-income threshold remained approximately constant and rose further at the beginning of the new decade.

In figure 1, we show corresponding thresholds for the East German population since 1990 as well (dotted line). The distance between the top and bottom thresholds is much smaller than for the total German population. Even 15 years after unification, the incomes were therefore distributed much less unequally there than in West Germany. At the same time, absolute income levels illustrate that the bottom incomes are about the same in both parts of the country, whereas the middle and especially the higher income levels are lower in the East. The main difference between the Eastern and Western income distributions is therefore the lower percentage of rich households in the East. Up to the second half of the nineties, the mean distance between Eastern and Western incomes diminished but has increased again in the last few years.

3.2 Low-income and Risk-of-poverty Rates at Different Thresholds

In the long run, the poverty rate follows the path of inequality with cyclical ups and downs (figure 2). The risk of poverty is the first of the key indicators of social exclusion according to EU standards («Laeken indicator») (Atkinson et al. 2002 and 2006). Beside this main indicator relating to the 60 percent median threshold, secondary indicators with additional thresholds are also defined for further differentiations at the lower income level (70 percent median) and for stronger poverty thresholds (50 percent and 40 percent median). All risk-of-poverty indicators together indicate the intensity of low income and poverty in the entire population.

Figure 2: Low-Income and Risk-of-poverty Rates at Different Thresholds, Germany, 1985–2005



Note: Low income and poverty thresholds of 70 %, 60 %, 50 %, 40 % of median equalized household net incomes of total population. Annual incomes (previous year), deflated; household net incomes equalized according to new OECD scale; 1985-1991: West Germany.

Source: SOEP

At the end of the 1980s, poverty rates were on a slight decline in West Germany. After unification, poverty rates rose until the mid-1990s and then fell again. In the first few years of the new millennium, poverty rates reached their highest levels since unification. The increase in low income and poverty rates within recent years can be observed at all thresholds, whereby the highest increase appeared not at the high end of the poverty scale, but in the low-income area.

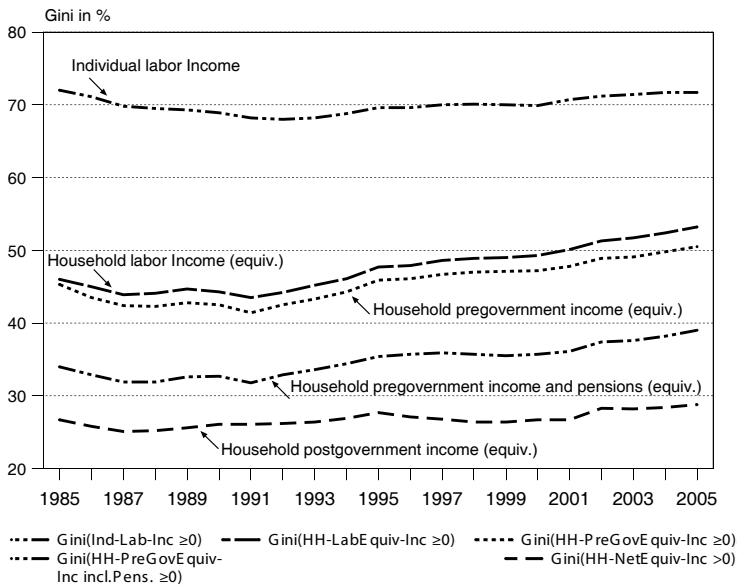
During the 1990s, the East German population experienced rising incomes and falling poverty levels. In the new decade, East German poverty rates have risen to disproportionately high levels. Low income and overall poverty rates have undergone dramatic increases among the East German population, whereas at the very high end of poverty scale, the rates were lower than in West Germany previously but are now almost the same.

4. The Redistributive Impact of Government and Household Activities

4.1 Trends in Income Inequality (Gini Coefficient)

The trends in relative income poverty rates usually follow the development of income inequality, which is summarized by the Gini coefficient. The reduction of social policy measures designed to combat social exclusion and mitigate increasing labor market pressures is usually regarded as the main cause of increased economic inequality. To examine whether this is true, we now incorporate a third factor into the analyses that is usually ignored in this social policy discussion: the composition of households.

Figure 3: Inequality of Individual Earnings and Pre- and Post-government Household Incomes, Germany, 1985–2005



Note: All Gini coefficients refer to the total population (including children and elderly). Annual incomes (previous year), deflated; household incomes equivalized according to new OECD scale; 1985–1991: West Germany.

Source: SOEP

Empirical results demonstrate that rising inequality is not the result of diminishing social benefits provided by the government, but mainly due to changes on the labor market and related intra-household earnings constellations. The overall inequality of household net equivalent incomes as measured by the Gini coefficient decreased at the end of the 1980s in West Germany, increased slightly after unification up to the mid-1990s, decreased again in the second half of the 1990s, and reached new heights after 2001 (figure 3). In contrast to these post-government income changes, the inequality in the underlying equivalized pre-government incomes also decreased up to unification but increased continuously thereafter. The level of pre-government income inequality is of course higher, since here, neither pensions nor the redistributive impact of other government activities (such as taxes and transfers) are considered. We therefore observe an increasing gap in the income inequality between pre- and post-government incomes.

After including pensions in pre-government incomes, the inequality decreases substantially but still remains higher than post-government reference incomes, following almost the same development as the former. The continuous increase in pre-government incomes can therefore not be attributed to a rising inequality in pensions.

Looking at the inequality in *individual* gross earnings before being aggregated and equivalized to household labor incomes, we again find a much higher level of inequality since all children and elderly people are considered here with zero incomes. Overall, the inequality of individual earnings decreased up to the early 1990s and then increased again steadily. However, despite this obvious long-term correspondence between the individual and the cumulated and equivalized development of household labor incomes, the increase in inequality is less extreme at the individual level. Therefore, the driving forces behind the continuous increase in inequality in Germany are related to intra-household arrangements for the distribution of market incomes.

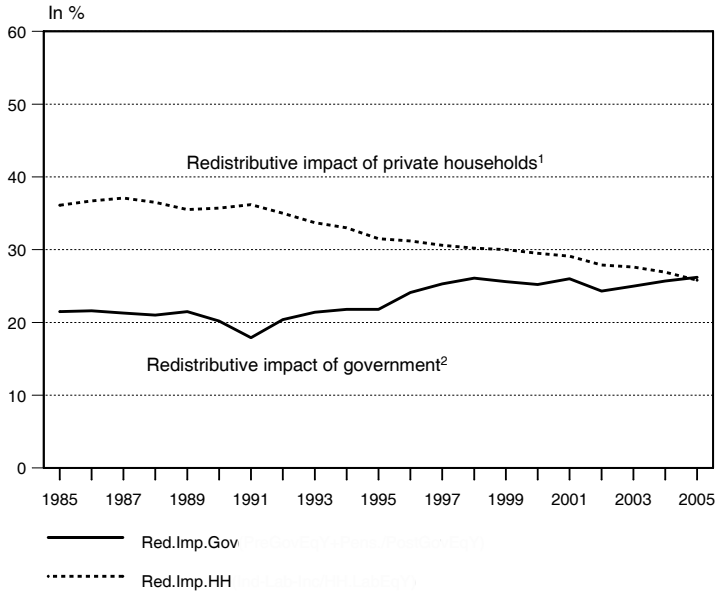
4.2 Redistributive Impact of Government Activities on Income Inequality

The ratios of pre- to post-governmental inequality illustrate the redistributive impact of government activities (Headey et al. 1995) on the reduction of inequality (figure 4). They show how the inequality induced by the market is reduced by government measures using (direct) taxes and transfers. The increasing ratios for household labor and pre-government incomes with and without pensions illustrate that the effect of government measures on inequality is not decreasing over time, but in fact increasing. The increasing inequality in post-government incomes can therefore not be attributed to a diminishing impact of the German government's social policy activities.

4.3 Redistributive Impact of Private Household Activities

The ratio of inequality in individual earnings to (equivalized) household labor incomes may be regarded in an analogous way as an indicator of the redistributive impact of household activities, which reduce earning inequality by living together and sharing all income

Figure 4: Redistributive Impact of Government and Private Households, Germany, 1985–2005



$$1 \quad ((\text{Gini individual labor incomes} - \text{Gini household labor incomes [equiv.]}) / \text{Gini individual labor incomes}) \times 100.$$

$$2 \quad ((\text{Gini household pre-government incomes and pensions [equiv.]} - \text{Gini household net post-government incomes [equiv.]}) / \text{Gini household pre-government incomes and pensions [equiv.]}) \times 100.$$

Note: Annual incomes (previous year), deflated; household incomes equalized according to new OECD scale; 1985–1991: West Germany.

Source: SOEP

resources within the household. The effect of households on the reduction of earnings inequality was much higher than the redistributive impact of government activities up to the beginning of the 1990s, but has been shrinking continuously ever since, such that in 2005, the two effects were approximately the same.

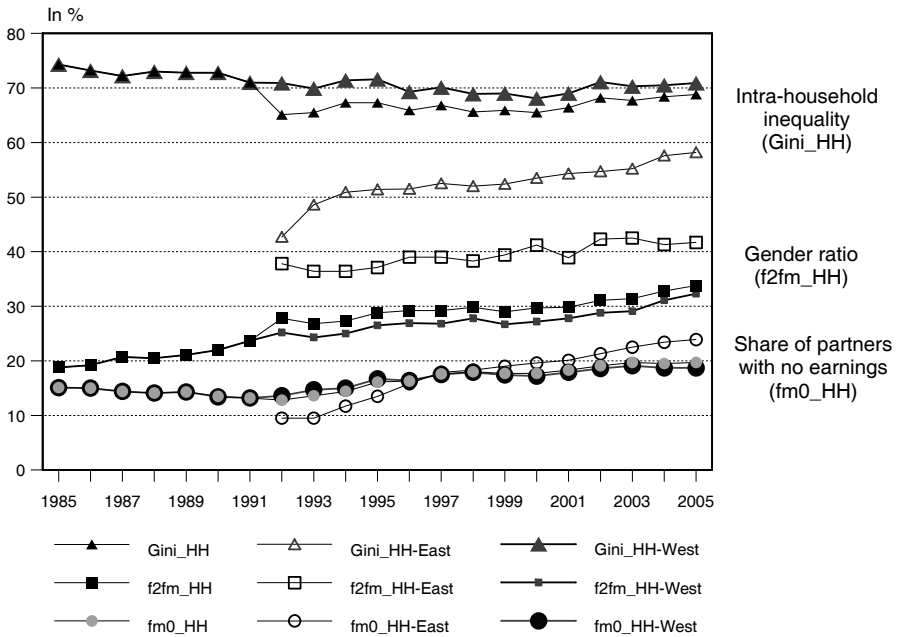
However, the decrease in the household impact on the reduction of inequality does not indicate that the social impact of intra-household relationships has diminished. On the contrary, this development indicates in fact that the inequality between households has increased and that some households are now more successful in gaining resources than before. Therefore the difference between more and less efficient households has increased. Even considering that equalized household inequality measures are based on the assumption of perfect redistribution among all household members, and that the equivalence weighting also affects inequality (Coulter et al. 1992), the development over time still shows an increasing inequality between households that cannot be fully explained by the increasing individual differences on the labor market. The rise in inequality in market-driven gross household

labor incomes can only partly be reduced to growing numbers of households without any connection to the labor market due to increased time spent in school and vocational training, periods of unemployment, or aging. Thus we must conclude that there is an increasing gap in household participation on the labor market.

4.4 Trends in Intra-household Earnings Ratios

This increasing inequality gap indicates differences in the economic performance between household members. To illustrate the long-term intra-household developments as well, we concentrate on male and female heads using two types of measures: the intra-household Gini coefficient as an indicator of earnings inequality between partners, the female-to-male ratio (f2fm-coefficient) between the two partners' earnings, and include the percentage of household heads without access to the labor market (fom0).

Figure 5: Intra-Household Inequality and Earnings Ratios between Male and Female Household Heads, Germany, 1985–2005



Note: Annual incomes (previous year), deflated; 1985-1991: West Germany.

Source: SOEP

These measures reveal some remarkable trends in Germany over the last 20 years. The analyses are restricted to household heads of potential working age, that is, between the ages of 16 and 74 years (figure 5). Intra-household inequality between male and female heads decreased

slightly up to the early 1990s but remained almost unchanged afterwards. In contrast, the female-to-male income ratio rose steadily from less than 20 percent in 1985 to about 33 percent in 2005. By the end of this same time period, female household heads earned only about one third of what male household heads earned. This measure also shows that the number of male and female household heads in households where neither partner is active on the labor market increased from 15 percent in the early 1990s to about 20 percent in 2005.

The levels are quite different between East and West Germany. In the East, the percentage of household heads who did not participate in the labor market was initially lower than in the West but increased sharply to about 24 percent, the female-to-male earnings ratio was initially much higher and remained at about 41 percent, and the inequality in earnings between the two partners was much lower and increased steadily, but still remained far from the West German levels at the end of the period under study. The East-West comparison reveals the expected relation: the higher the gender ratio the lower the inequality between male and female heads, whereas over time, intra-household inequality in West Germany remained stable while the gender ratio increased.

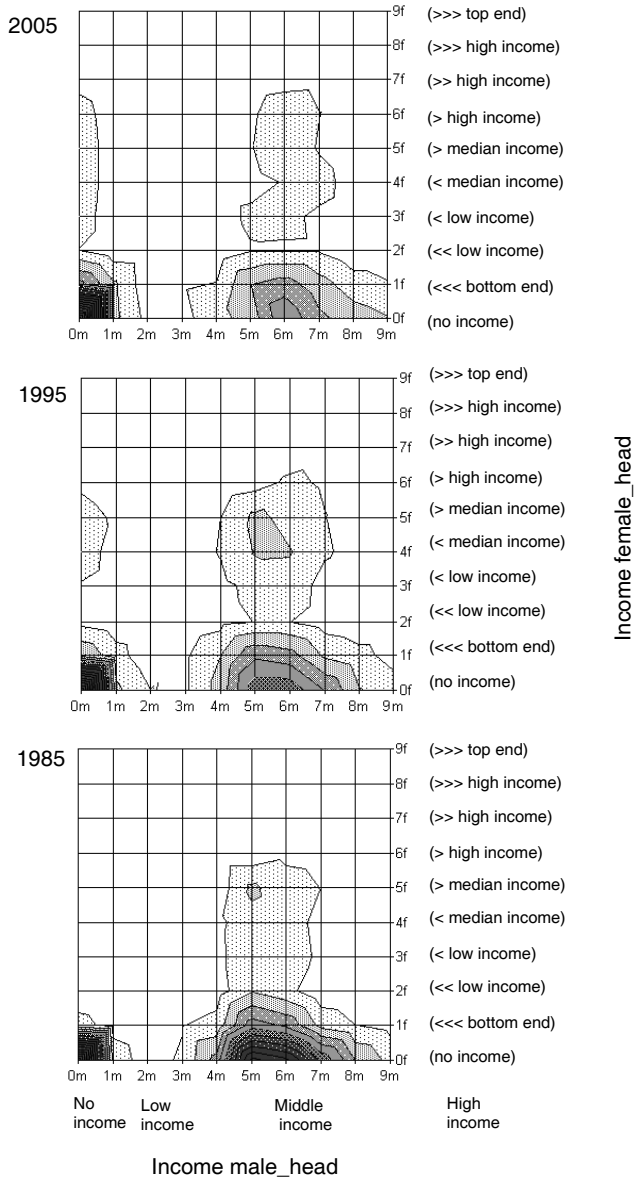
The most interesting question arising from these trends is, how could it be that between partners, the ratio of female-to-male earnings increased, while at the same time the inequality between the two remained unchanged. The answer is quite simple: a greater variety of earnings ratios between male and female household heads emerged, such that male household heads are no longer the main breadwinners, but female household heads as well. The full earnings ratios for couples are documented in greater detail in the next chapter.

5. Intra-household Earnings Ratios Between Male and Female Household Heads

5.1 Earnings Ratios Between Male and Female Household Heads

To identify variations in earnings ratios between male and female household heads over time, the full range of earnings of both household heads has to be considered. We have therefore recoded the earnings of male and female heads to proportional income categories (this grouping procedure is outlined in the appendix). Here, we use zero for no income, one to three for the low-income area, four and five for the middle categories separated by the median, and six to nine for higher earnings. The categories two to eight are all separated by a 33 percent increase in earnings at each level. The reference points to derive the earnings threshold are identical for both partners: the median of total positive annual earnings of the entire German population between the ages of 16 and 74 years. The proportional earnings categories of male and female household heads aged 16 to 74 years are plotted against each other (x-axis=male heads, y-axis=female heads) and all cells with more than one percent of the population are highlighted: the higher the percentage representation of the cell, the darker the pattern. These contour plots are repeated in ten-year intervals for the years 1985, 1995, and 2005, such that shifts in the earnings ratios between partners can be identified (figure 6, p. 142).

Figure 6: Earning Ratios between Male and Female Household Heads,¹ Germany, 1985–1995–2005. Proportional Income Categories (PICs, 33 % med, $y>0$)²



¹ Couples aged 16-74.

² PICs, based on median of earnings >0 with 33%-income increase in each category.

Note: 1985: West Germany.

Source: SOEP

According to these contour plots, in West Germany in 1985, the male-breadwinner model was still predominant: male earnings are concentrated mainly in the middle (four, five) and higher-income categories, while positive female earnings are typically present when the male's earnings are around or just above the median. Seldom did incomes of female household heads appear higher than the median categories at this time.

Ten years later – and five years after German unification – female participation in the labor market had increased. For this reason, we observe that male household heads at all income levels showed a higher rate of having female partners with at least low earnings, and that a double-income type of household with both partners around median earnings had established itself. In addition, another new model had appeared that did not exist ten years before: the female breadwinner with no male earnings.

By 2005, the variation in female-to-male earnings ratios had increased further. The household type in which both partners had no or only low incomes had increased. In cases where male household heads had no earnings, the female-breadwinner model had grown. Female heads were now also more present in higher income categories than before, and the double-income types had shifted to higher income categories on both sides.

Summarizing, the male-breadwinner model is no longer the predominant one as it was 20 years ago. While most earnings constellations are still asymmetrical in the sense that male heads contribute the majority of the common budget and female heads add supplementary income – typically through part-time work with lower gross earnings –, a female-breadwinner model has now established itself alongside the male-breadwinner model. The two-partner, no-or-only-low-earnings constellation presents a stark contrast to the two-partner middle-and-higher-income constellation, both of which have increased in incidence. It seems clear that due to the slump in the German economy over the last decade and the high risk of unemployment, households were forced to choose flexible earnings arrangements between partners, where either the male or the female head contributes the majority of the common budget. The changes in earnings profiles between male and female heads may be regarded as a dynamic intra-household strategy against the growing risks of the market, so that at least one of the partners – usually the male head – achieves reasonable earnings. However, the typical earnings ratio between male and female heads seems to remain asymmetrical, either in the one or the other direction.

The overall trends in intra-household earnings ratios over the last two decades in Germany show the following (table 1, p. 144): the median earning positions have risen overall, whereby the median earnings of male household heads are still above the median but are decreasing slightly over time. The median earning positions of female household heads have increased significantly but are still much lower than those of male heads. The very high inequality on earnings between male and female heads was shrinking somewhat at the end of the 1980s but remained unchanged afterwards, while we observe a continuous increase in the female-to-male ratio on earnings at the same time. The fraction of earning ratios where both partners have no earnings has also increased over the last decades.

Table 1: Earnings Ratios between Male and Female Household Heads, Germany, 1985–2005

Population ([Par.] couples, aged 16–74)		1985 ¹	1989 ¹	1993	1995	1997	2001	2005
Individual earnings (median of earnings > 0 = 100)								
All	Rel. inc. (med. = 100)	52.0	54.8	57.1	54.4	55.4	56.5	58.3
Par.	Rel. inc. male head (med. = 100)	129.7	124.8	122.9	116.0	117.5	118.5	117.8
Par.	Rel. inc. female head (med. = 100)	29.1	31.3	40.5	41.0	43.3	43.8	45.9
Par.	Gini_HH (in%)	74.4	72.7	65.5	67.3	66.8	66.4	68.8
Par.	f2fm_HH (in%)	18.8	21.1	26.8	28.5	29.2	29.7	33.8
Par.	fm0_HH (in%)	15.0	14.2	13.6	15.8	17.5	18.4	19.7

¹ 1985, 1989 West Germany.

Par. = Male and female heads of households, living together

Rel. inc. = Relative income position (median = 100)

Gini_HH = Intra-household Gini coefficient between male and female heads (*100)

f2fm_HH = Gender relation of female / female+male heads of household (*100)

fm0_HH = Share of male and female heads without earnings

Source: SOEP

5.2 Partner Earnings Ratios at Different Welfare Levels and Life Stages

In the following section we examine whether the female-to-male earnings ratios differ between the rich and the poor and how they vary at different welfare levels (table 2). Household welfare levels are also operationalized by proportional income categories (as described in the appendix): the first two bottom categories differentiate the population below the poverty line, the third category covers the population at or around the poverty line, the categories four and five include the population with middle incomes in households below and just above the median, the categories six to nine cover the higher to top levels of household income. The first column indicates the relative household income position (median=100) for each category.

Relative individual earnings positions are much lower than the corresponding household income levels because zero earnings are not considered for median reference earnings (median of positive individual gross earnings = 100) but are included afterwards. Earnings are distributed across the welfare levels much more unequally than post-government household incomes. Especially the earnings of male heads differ widely between rich and poor, whereas the lower earnings of female heads are distributed much more equally across the different welfare levels. The intra-household inequality in earnings is extremely high for the poor, decreases up to the middle classes, and remains constant in the higher income brackets. In line with other studies (Pahl 1983 and 1995, Ludwig-Mayerhofer et al. 2006, Trappe/Soerensen 2006), the male-female earnings ratio indicates larger income fractions of women living in poor and extremely poor households, whereas in the middle and higher welfare levels, women typically earn around 30 percent of men's earnings. The fraction

Table 2: Earnings Ratios between Male and Female Household Heads¹ at Different Welfare Levels (Proportional Income Categories of Household-Net Equivalent Income)

2005	HH income		Individual earnings				Individual earnings					
	Rel. inc.		Male heads		Female heads		Gini_HH		f2fm_HH			
	All	Med. = 100	All	Med. = 100	Med. = 100	Med. = 100	Par. (y > 0)	0-100	Par. (y > 0)	0-100	fm0_HH	Par. (y = 0)
Total		111.7	58.3	117.8	45.9	68.8	33.8	19.7				
Proportional income categories²												
Poor, res.	(<<poor)	31.5	8.0	4.9	12.9	95.3	75.0	43.8				
Poor	(<poor)	52.8	15.1	25.4	17.9	79.8	50.1	31.1				
Low income	(<<median)	68.2	22.8	52.0	19.1	84.0	34.9	28.5				
Middle income	(<median)	88.5	37.9	81.5	28.9	73.5	29.1	23.5				
Middle income	(>median)	113.8	58.9	122.7	41.8	66.4	29.0	13.8				
High income	(>>median)	146.8	86.4	158.2	62.9	60.1	31.4	13.5				
Rich	(>rich)	190.5	119.9	211.8	90.0	54.0	32.4	8.9				
Rich, res.	(>>rich)	288.8	187.2	320.7	122.0	59.1	28.7	5.3				

¹ Couples, aged 16-74.

² PICs, based on median, 30% income increase within each category.

Par. = Male and female heads of households, living together

Rel. inc. = Relative income position (median = 100)

Gini_HH = Intra-household Gini coefficient between male and female heads (*100)

f2fm_HH = Gender relation of female/female+male heads of household (*100)

fm0_HH = Share of male and female heads without earnings

Source: SOEP

of households in which both partners have no earnings is of course also highly correlated with the overall household welfare level.

Since welfare levels also vary across the different life stages, we show the household income position relative to the median according to the differentiation of household types. Partner households usually achieve higher welfare levels and also marginally higher earnings than non-partner households (table 3a). Partner households without children reach higher welfare levels than households with young children, whereas households with older children again enjoy relatively high incomes. However, households without children also include a large fraction of retired household heads with no earnings.⁷

Looking at the intra-household earnings ratios across life stages in detail (table 3b, p. 148), the relative earnings are highest for prime-age, two-partner households without children because of the higher earnings of the female household heads. Male heads receive the highest earnings in partner households with young children aged seven to twelve years, female heads earn most as mentioned in prime-age two-partner households without children. The intra-household earnings inequality is highest for households with two or more young children aged zero to six years and for households with the youngest child between the ages of seven and twelve years. Intra-household inequality in earnings is also high for older two-partner households without children, due to conventional relationships but also due to the two partners entering retirement at different points in time. The female-to-male earnings ratio is around 44 percent for households without children, 27 percent for households with young children, and 39 percent for households with older children. Along with households of retirement age, households with very young children make up a higher fraction of those with no earnings from either household head.

6. Conclusions

This article confirms findings of increasing inequality and growing risk-of-poverty rates in Germany in a long-term perspective. The empirical analyses look at the period from the mid-1980s in West Germany up to 2005, with the period after unification covering Germany as a whole. During the 1990s, the purchasing power of most of the population hardly increased. Since the turn of the millennium, the top incomes have achieved higher gains while at the bottom, low-income levels even fell in some years. Inequality measures and risk-of-poverty rates have therefore risen since the end of the 1990s. East German income levels showed remarkable growth rates up to the second half of the 1990s, gradually reducing the difference between the lower Eastern and Western income levels. However, since the end of the 1990s, East German incomes showed less dynamic growth, such that the difference between East and West German median incomes is rising again. Particularly the increase in low income and poverty rates in recent years has affected the East German population

7 It should be kept in mind that here only earnings are considered, and not pensions. Higher proportions of female earnings may therefore also result if males are earlier retired than women.

Table 3a: Earnings Ratios between Male and Female Household Heads¹ at Different Life Stages

2005	HH inc.		Individual earnings				Individual earnings					
	Rel. inc. pos.		Rel. inc. pos. (all=100)		Female heads		Gini_HH		f/(f+m)		(f+m)=0	
	All	Med.= 100	All	Med.= 100	Male heads	Med.= 100	Par. (y>0)	0-100	f2fm_HH	0-100	fm0_HH	%
Partner-Households												
1	Partner-HH	116.9	59.7	117.8	45.9	68.8	33.8	19.7				
2	Non-Partner-HH	97.5	54.5	-	-	-	-	-				
Partner-HH, children												
1	Par.HH no children	126.8	62.1	69.8	44.6	64.6	44.2	39.0				
2	Par.HH with children <18	106.1	53.9	152.4	42.6	72.2	27.2	6.8				
3	Par.HH w. children >=18	127.7	73.1	127.1	60.5	64.5	38.8	12.2				

¹ Couples, aged 16-74.

Par. = Male and female heads of households, living together

Rel. inc. = Relative income position (median = 100)

Gini_HH = Intra-household Gini coefficient between male and female heads (*100)

f2fm_HH = Gender relation of female/female+male heads of household (*100)

fmo_HH = Share of male and female heads without earnings

Source: SOEP

Table 3b: Earnings Ratios between Male and Female Household Heads¹ at Different Life Stages

2005	HH inc.		Individual earnings				Individual earnings					
	Rel. inc. pos.		Rel. inc. pos. (all = 100)		Female heads		Gini_HH		f/(f+m)		(f+m) = 0	
	All	Med. = 100	All	Med. = 100	Male heads	Med. = 100	Par. (y > 0)	0-100	f2fm_HH	0-100	fmo_HH	%
Partner-HH, life stages												
1	Par.HH, no ch., H.16-34	107.3	89.6	87.6	74.6	51.8	47.5	3.1				
2	Par.HH, no ch., H.35-44	151.4	126.4	137.8	91.6	54.6	42.4	4.0				
3	Par.HH, 1 ch. 0-6	107.6	58.9	121.0	48.0	64.7	30.9	8.6				
4	Par.HH, 2+ch., young. 0-6	99.5	44.0	149.0	29.1	80.5	22.0	8.6				
5	Par.HH, young.ch. 7-12	114.1	56.9	176.0	38.6	75.0	24.9	5.9				
6	Par.HH, young.ch. 13-17	104.0	59.1	149.8	59.8	64.0	33.3	4.8				
7	Par-HH, young.ch. 18+	129.1	75.7	135.5	63.8	64.0	38.1	8.1				
8	Par-HH, no ch., H.55-74	125.4	42.8	53.7	29.0	77.1	44.4	48.5				
9	Par.HH, no ch., H.75+	109.9	3.0	5.3	0.7	97.3	34.0	93.6				

¹ Couples, aged 16-74.

Par. = Male and female heads of households, living together

Rel. inc. = Relative income position (median = 100)

Gini_HH = Intra-household Gini coefficient between male and female heads (*100)

f2fm_HH = Gender relation of female/female+male heads of household (*100)

fmo_HH = Share of male and female heads without earnings

Source: SOEP

disproportionately. Nevertheless, income levels at the very bottom of the distribution are almost the same in both parts of the country, the main difference being a lower concentration of higher incomes and a less unequal distribution in the East.

To identify the driving forces behind increasing inequality, we have considered pre-government incomes as well. Our results confirm a growing inequality in market income aggregated at the household level, and in post-government household net income. The effect of government redistribution measures at decreasing inequality has not diminished: thus, the main reasons for rising inequality must be connected with developments on the labor market.

Further differentiations between the earnings at the household and individual levels reveal another quite strong effect: that of private households' redistribution activities, which are not taken into account in the current social policy debate. Parents care for their children within the household and household members share household resources. The empirical results clearly underline that the redistributive impact of this type of private household activity is much higher than redistributive impact of government activities (without pensions), but that it is shrinking over time. The reasons are, on the one hand, socio-demographic trends like individualization and aging that are changing the composition of household types. On the other hand, the intra-household earnings distribution between male and female household heads has changed as well due to increasing female labor market participation.

The latter point leads back to the discussion about the market's impact on income inequality. Usually, intra-household analyses only use indicators like the female-to-male earnings ratio. However, there is a crucial difference between the female role in male income and the earnings inequality between partners, and this difference has been neglected in the literature on intra-household earnings ratios thus far. The empirical results confirm on the one hand that in Germany, female heads are contributing an increasing proportion of household income over time, while at the same time, the intra-household inequality between the partners has hardly changed at all. The explanation for this initially puzzling result is that intra-household variations in earnings are now much more multifaceted than in previous decades.

Detailed contour plots using proportional income categories illustrate these findings: along with the male-breadwinner type, a female-breadwinner type has established itself with no or low earnings for the male and higher earnings for the female household head.

From this point of view, the overall increase in inequality appears to be the result of an adaptation of intra-household earnings ratios between male and female heads. There is an increasing group of households where both partners have no or low earnings and another growing group of households where both partners are successful on the labor market and where both have middle or higher incomes. The variations in the earnings ratios between male and female household heads have therefore increased. However, this has not necessarily led to more equal earning ratios between partners. Rather, it seems that although female-to-male earnings ratios are increasing, the asymmetrical earnings profiles remain typical of intra-household distribution arrangements.

The earnings ratios between partners are not the same for all welfare levels and differ between household types over the life cycle. The results confirm that higher female-to-male earnings ratios are more typical for the low welfare levels. Intra-household earnings inequality is also – as expected – highest for households with two or more young children; female heads earn most in prime-age partner households without children, while male heads earn most in couples with young children.

Summarizing, the male-breadwinner model is no longer as predominant as it was 20 years ago. It seems clear that due to the slump in the German economy over the last decade accompanied by high unemployment risks, couples were forced to choose flexible earnings arrangements where either the male or the female head contributes the majority of the common budget. The changes in earnings profiles between male and female heads may be regarded as reflecting a dynamic intra-household strategy of protection against the growing risks of the market, whereby at least one of the partners – usually still the male head – is able to achieve reasonable earnings.

Appendix

A 1. Proportional Income Categories (PICs)

The recoded household income variables based on PICs describe the different welfare levels of the households in comparable income categories for the full range of incomes from rich to poor (table A1.1). The first two categories include the population up to the poverty line, the next two categories cover the population between the poverty line and the median, and the other four categories differentiate the population above the median accordingly. Both middle categories with a 30 percent increase in incomes up to and above the median income together cover about 40 percent of the population. The mean income level in the residual top category is, in this classification, nearly ten times higher than the mean income level at the bottom end.

The population shares for the recoded individual earnings variable based on PICs is presented here for all individuals aged 16 to 74 years, both including and excluding those with no individual earnings (table A1.2). A further differentiation illustrates the different earning profiles of male and female heads.

Nearly half of the population aged 16 to 74 years with at least some chance of labor market participation has no individual earnings; and as much as 32 percent of male heads and about 41 percent of female heads living in two-partner households have no individual earnings. Looking at the earnings distribution of those who are active on the labor market, about 40 percent appear in the low-income area, which corresponds approximately to the ILO criteria (less than two thirds of median gross earnings), and as much as 16 percent of the male and 58 percent of the female heads have individual earnings below this threshold.

However, to evaluate these undoubtedly very high population shares with no or low individual earnings, it should be considered that this population includes individuals who are still attending school or university, on maternity leave, retired and possibly receiving

Table A 1.1: Proportional Income Categories (PICs) (Household Net Equivalent Incomes), 2005

2005		Population share (in%)	Rel. inc. pos. med.=100 (Mean)
Total		100.0	111.7
PIC [med.,30] ¹			
1	Poor, res. (<<poor)	8.3	31.5
2	Poor (<poor)	7.9	52.8
3	Low income (<<median)	14.1	68.2
4	Middle income (<median)	19.7	88.5
5	Middle income (>median)	21.0	113.8
6	High income (>>median)	14.9	146.8
7	Rich (>rich)	8.8	190.5
8	Rich, res. (>>rich)	5.4	288.8

1 PICs, based on median, 30% income increase in each category.

Source: SOEP

Table A 1.2: Proportional Income Categories (PICs) (Individual Earnings), 2005

2005	Population age 16–74	Total			Earnings > 0		
		All	Partner_HH Male heads	Female heads	All	Partner_HH Male heads	Female heads
Total		100.0	100.0	100.0	100.0	100.0	100.0
PIC [med.,33,yab > 0] ¹							
0	No income (no income)	49.3	31.8	41.3			
1	Low income, res. (<<<bottom end)	13.5	5.9	21.5	26.6	8.6	36.6
2	Low income (<<low income)	3.0	2.1	5.6	6.0	3.1	9.5
3	Low income (<low income)	3.8	2.8	6.8	7.5	4.0	11.6
4	Middle income (<median income)	5.0	4.9	6.9	9.9	7.2	11.7
5	Middle income (>median income)	6.7	10.2	6.9	13.3	15.0	11.8
6	High income (>high income)	8.4	16.0	6.4	16.7	23.5	11.0
7	High income (>>high income)	5.4	11.8	3.2	10.7	17.3	5.5
8	High income (>>>high income)	2.8	8.1	0.9	5.5	11.9	1.6
9	High income, res. (>>>top end)	2.0	6.3	0.5	3.9	9.3	0.8

1 PICs, based on median of earnings > 0 with 33% income increase in each category.

Source: SOEP

good pensions that are not considered here – along with individuals who are unemployed or otherwise not active on the labor market. Also for the high percentage of individuals beneath the low-income threshold, it should be considered that here only absolute gross earnings were counted regardless of how much working time was involved. The low-income area therefore includes students with part-time jobs, men and woman of prime age who are simply adding supplementary income to the joint household budget, and also pensioners working at part-time jobs after retirement. Finally it should be considered that the underlying income variable relies on annual income, so that individuals who did not work for the whole previous year may show lower figures than those working the whole year.

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