

## CAN HOUSEHOLDS AND WELFARE STATES MITIGATE RISING EARNINGS INSTABILITY?

BY CHARLOTTE BARTELS\* AND TIMM BÖNKE

*Department of Economics, Free University Berlin*

We compare the evolution of earnings instability in Germany and the United Kingdom, two countries which stand for different types of welfare states. Deploying data from the German Socio-Economic Panel (SOEP) and the British Household Panel Survey (BHPS), we estimate permanent and transitory variances of male income over the period 1984–2009 and 1991–2006, respectively. Studies in this literature generally use individual labor earnings. To uncover the role of welfare state and households in smoothening earnings shocks, we compute different income concepts ranging from gross earnings to net equivalent household income. We find evidence that the overall inequality of earnings in Germany and the United Kingdom has been rising throughout the period due to both higher permanent earnings inequality and higher earnings volatility. However, taking institutions of the welfare state and risk-sharing households into account, we find that the volatility of net household income has remained fairly stable. Furthermore, redistribution and risk insurance provided by the welfare state is more pronounced in Germany than in the United Kingdom.

**JEL Codes:** D31, D63, I38, J31

**Keywords:** earnings dynamics, earnings inequality, permanent income inequality, safety net, transfer payments, transitory income volatility

### 1. INTRODUCTION

The crisis of the welfare state has been widely discussed in the last two decades. Facing budget constraints and globalization, governments in many industrialized countries have retrenched social policies since the 1980s. Following the hypothesis that globalization, deregulation, and technological change contributed to fostering competitive pressures and risks for employees, it has often been argued that these result in growing income uncertainty (Rodrik, 1998). Higher income uncertainty may in turn increase risk faced by individuals or households, leading to welfare loss, as it is generally assumed that people are risk-averse (Gosselin, 2008; Hacker and Jacobs, 2008).

The evolution of income volatility and economic inequality, especially for the U.S., United Kingdom, and Canada, has been in the focus of empirical researchers since the seminal paper by Gottschalk and Moffitt (1994). The literature has produced evidence of a trend of rising income inequality in these countries (*inter alia* Dynarski and Gruber, 1997; Haider, 2001; Baker and Solon, 2003; Dynan

*Note:* We thank two anonymous referees and the editor for valuable suggestions. Furthermore, we are grateful to Giacomo Corneo and Stephen Jenkins for their most helpful advice and support throughout the research, to Joshua Holm for his assistance, and to participants of ECINEQ 2009 and IIPF 2010 conferences for useful comments. All remaining deficiencies are our own responsibility.

\*Correspondence to: Charlotte Bartels, Department of Economics, Free University Berlin, Boltzmannstr. 20, 14195 Berlin, Germany (charlotte.bartels@fu-berlin.de).

*et al.*, 2008; Nichols and Zimmerman, 2008; Beach *et al.*, 2010; Shin and Solon, 2011). Most contributions decompose overall income inequality into a permanent component, mirroring the disparity of permanent incomes, and a transitory component, covering short-term volatility, to uncover the driving force behind rising total inequality.

In particular, research from the cross-national perspective contrasting different types of welfare states, for example, the Anglo-Saxon model to the continental European or Scandinavian model, is scarce. Up to now, few studies have included Germany and the United Kingdom (Van Kerm, 2003; Daly and Valletta, 2008; Sologon and O'Donoghue, 2010). For example, Daly and Valletta (2008) find substantial convergence between the United Kingdom and Old German Laender in the 1990s driven by both a rising permanent and transitory earnings component in Germany. But for the most part, research is restricted to either labor market earnings or net household income and is, in particular, scarce on the German case.<sup>1</sup> Whether transitory income shocks turned out to be smaller than preceding labor market earnings shocks, is still an unanswered question. The tax and transfer system as well as income pooling could contribute to such an effect. Comparing Germany and the United Kingdom is apparently interesting for two reasons. First, the less pronounced Anglo-Saxon welfare state in the United Kingdom potentially provides less income smoothing than the more interventionist welfare state of the continental European type in Germany. Second, the timing and intensity of globalization affected the two countries differently and so was the reaction of policy makers to these challenges: while the major reforms in the United Kingdom were carried out in the late 1990s, in Germany it did not happen until the 2000s. Hence, a more comprehensive and earlier labor market deregulation in the United Kingdom than in Germany is likely to have a different impact on instability and inequality in labor market outcomes. We compute permanent and transitory variances of male income over the period 1984–2009 for the Old German Laender and over the period 1991–2006 for the United Kingdom. Variances are estimated for five different income concepts, ranging from gross earnings to net household income, to uncover the role of households and the welfare state in smoothening labor market shocks. Furthermore, variances computed for subgroups allow further insight if, for example, younger age groups, singles or lower income quartiles are more affected by income volatility.

The remainder of this article is structured as follows: In Section 2 the theoretical background of permanent and transitory components summing to overall inequality is discussed and results from previous studies are presented. Furthermore, the applied method is illustrated. The data deployed in the main empirical analysis for Germany is a subsample of the Socio-Economic Panel (SOEP). The characteristics of the sample are described in Section 3. In Section 4 our findings

<sup>1</sup>Myck *et al.* (2011) conclude that the permanent earnings component's share grew during the 1990s, but from 2000 on they identify the transitory component as the driving force behind the increasing cross-sectional earnings inequality in Germany. Biewen (2005) finds that transitory income shocks to net household income gained in size over the 1990s in Germany relative to a fairly stable permanent component.

for Germany and the United Kingdom are compared. In addition, the German case is dissected in depth, revealing subgroup specific patterns. Section 5 concludes and reviews the main findings.

## 2. CONCEPTUAL FRAMEWORK

### 2.1. Volatility, Utility, and Welfare

We assume a world with decreasing marginal utility of consumption and risk-aversion. In this setting, welfare gains may occur from two sources. First, risk-averse households or individuals who experience a more volatile income than others are worse off. Uncertain income may even translate into lower consumption expenditures if households respond with higher precautionary savings (e.g., Blundell and Preston, 1998). Hence, providing risk insurance can lead to a welfare gain. Second, redistributing income between households evens out consumption possibilities and, if disincentives are small enough, may enhance overall welfare. To model both income volatility and income inequality, we split individual  $i$ 's income  $y$  in period  $t$  into two components:

$$(1) \quad y_{i,t} = \bar{y}_{i,t} + v_{i,t},$$

where  $\bar{y}_{i,t}$  denotes the permanent component and  $v_{i,t}$  the transitory component of income. Thereby, the permanent component mirrors the long-term level of income driven by personal characteristics like education and other skills. Rising differences in the permanent component between high- and low-skilled workers can be traced to skill-biased technical change and globalization weakening the bargaining power of low-skilled workers in industrialized countries (e.g., Fortin and Lemieux, 1997; Autor *et al.*, 2008). If welfare state intervention aims at redistribution, policy measures should be directed at evening out this income component. Indeed, empirical studies find that welfare states successfully equalize rising market income inequality.<sup>2</sup> Typically, this is, amongst others, achieved by cash or in-kind welfare benefits for the needy and the provision of public goods financed by progressive income taxation. Depending on the disincentives related with the level of redistribution and the social welfare function assumed (e.g., the aggregation or comparison of individual utility levels), there is a trade-off between efficiency and equality. Welfare gains may be realized, but do not necessarily occur (Browning and Johnson, 1984).

The transitory component captures short-term income shocks caused by, for example, periods of unemployment. Two factors are argued to have a substantial impact on short-term income shocks: globalization and institutional change. In the face of globalization, economic vulnerability in global markets rises and income shocks become more frequent (e.g., Rodrik, 1998); policy makers opted for deregulation to achieve more flexible labor markets, which, for example, raises the risk of short-term unemployment. Consequently, the risk insurance provided by a

<sup>2</sup>The evolution of the redistributive effect of Western welfare states is, amongst others, documented by Kenworthy and Pontusson (2005). For Germany, see the first and third poverty and wealth report of the German Federal Government (Bundesregierung, 2001, 2008) and Bach *et al.* (2009).

welfare state is to some extent endogenous and reflects the needs emerging from a changing economic environment. In our analysis risk insurance may be provided by two institutions: the household and the welfare state. Potential welfare gains in this context are easy to argue as they do not hinge upon the inter-individual comparison of utility levels. For instance, the multi-person-household provides insurance for the individual through income pooling (e.g., Dynarski and Gruber, 1997). In doing so, the capability of absorbing shocks rises with household size and the mechanism is straightforward: if shocks are independent across household members and household size economies exist, pooled equivalent income is more stable than individual income and the household contributes to smooth income variation and stabilize consumption.<sup>3</sup> However, the ongoing demographic trend in many industrialized countries toward more one-person and single-parent—and thus single-earner—households reduces average household size and lessens the capability of income pooling (e.g., Peichl *et al.*, 2012).

The role of governments as insurer is widely discussed in the literature. Economic theory sees efficiency gains in the presence of market information failure if insurance is provided by the welfare state. In particular, under conditions of strong information asymmetries, credit constraints, and adverse selection, the welfare state may be a more efficient insurer against risks than the private sector (Barr, 1998). However, excessive high levels of insurance may evoke the wrong incentives and thus reduce overall welfare (e.g., Sinn, 1995). In sum, although modern welfare states provide extensive risk insurance, their intervention must not necessarily lead to a Pareto improvement. However, in the presence of market failure the stabilizing effect of welfare state intervention by means of progressive taxation and a compulsory social security systems is, in theory, welfare enhancing. And indeed, in modern welfare states we regularly find progressive taxation and compulsory social security systems that offset earnings volatility sizably.<sup>4</sup> Furthermore, taking into account recent developments in globalization, insurance provided by the welfare states might even expand as people may feel more economically insecure (Schewe and Slaughter, 2004). Therefore, a heightened economic vulnerability in global markets which is likely to intensify social risks may be compensated by expanding insurance provided by the welfare states (Rodrik, 1998).

## 2.2. Methodological Considerations

To compute the permanent and transitory component of overall earnings inequality, we adjust the approach introduced by Gottschalk and Moffitt (1994). Following them, we calculate the permanent and transitory variance as a moving average centered on a reference year. This approach is very appealing for its data requirements in terms of panel structure. In order to derive the measures needed, only two individual observations are necessary, and thus sample size is fairly large

<sup>3</sup>Dynarski and Gruber (1997) find evidence that, in addition to the institutions of the welfare state, families do offset earnings variations and smooth their consumption. Dynan *et al.* (2008) establish that rising volatility of market income could only partly be buffered by households between 1967 and 2004.

<sup>4</sup>The level of insurance differs a lot. For instance, the more progressive German tax system and more pronounced social security system offsets earnings volatility sizably compared to the United Kingdom and U.S. (Chen, 2009; Dolls *et al.*, 2011).

compared to more technically sophisticated studies utilizing the auto-covariance matrix of earnings (for Germany, see Biewen, 2005; Myck *et al.*, 2011). In addition, Moffitt and Gottschalk (2012) demonstrate that the applied method approximately yields the same time series patterns.<sup>5</sup>

Consider  $i = 1, \dots, N$  individuals with real earnings over  $t = 1, \dots, T$  periods. First, we want to adjust earnings for life-cycle effects, since age has an important impact on earnings. Following Mincer (1974), earnings increase both faster and sharper in the beginning of the career than at later stages of the life-cycle until retirement earnings drop. Therefore, all individual log earnings within a five-year window are regressed on age and age squared and a common age-earnings-profile is identified. The residuals from this regression form the basis of our following analysis. Our income measure  $y_{i,t} = \bar{y}_{i,t} + v_{i,t}$  from equation (1) is, as a consequence, the deviation of the individual's earnings from the common age-earnings profile (Gottschalk and Moffitt, 1994). Furthermore, we define the permanent component  $\bar{y}_{i,t}$  as the average earnings realized over a five-year window centered around  $t$ . Taking into account that individual earnings are not necessarily reported over the whole five-year window centered around  $t$  but for  $K_{i,t}$  of the five years, permanent earnings are calculated as  $\bar{y}_{i,t} = \frac{1}{K_{i,t}} \sum_{s=t-2}^{t+2} y_{i,s}$ , with  $K_{i,t} \in [2, 5]$ . In addition, the transitory component is the deviation of annual earnings measure from permanent earnings,  $v_{i,t} = y_{i,t} - \bar{y}_{i,t}$ . Based on this, the transitory variance of individual  $i$  is calculated as the variance of transitory earnings in the five-year window centered around  $t$ :

$$(2) \quad \text{Var}(v_{i,t}) = \frac{1}{K_{i,t} - 1} \sum_{s=t-2}^{t+2} (y_{i,s} - \bar{y}_{i,t})^2.$$

Averaging (2) over all  $N$  individuals yields the overall sample transitory variance in  $t$ :

$$(3) \quad \sigma_{v,t}^2 = \frac{1}{N} \sum_{i=1}^N \left[ \frac{1}{K_{i,t} - 1} \sum_{s=t-2}^{t+2} (y_{i,s} - \bar{y}_{i,t})^2 \right].$$

In a final step, sample permanent variance of earnings is derived. We derive mean permanent earnings as  $\bar{y}_t = \frac{1}{N} \sum_{i=1}^N \bar{y}_{i,t}$  and the average number of observations over all individuals in the respective five-year window,  $\bar{K}_t = \frac{1}{N} \sum_{i=1}^N K_{i,t}$ . From here, the permanent variance is calculated:

$$(4) \quad \sigma_{\mu,t}^2 = \frac{1}{N-1} \sum_{i=1}^N (\bar{y}_{i,t} - \bar{y}_t)^2 - \frac{\sigma_{v,t}^2}{\bar{K}_t}.$$

<sup>5</sup>However, some drawbacks remain. As Gottschalk and Moffitt (2009) point out, exact turning points in time series of transitory earnings cannot be derived and subtle dynamic processes in earnings such as serial correlation, random walks, or random growth are not treated correctly.

In sum, we measure the growth of income volatility comparing the variances of the components as the change between one period and the subsequent period, i.e., the growth rate of the variances. The variance of the permanent component can be seen as the permanent income inequality showing the persistent dispersion of income within the population. The variance of the transitory component can be interpreted as the volatility of the individual earnings profile.

### 3. DATA

The analysis is based on two data sources, a subsample from the SOEP for the years 1984 to 2009 and a subsample from the British Household Panel Survey (BHPS) covering years 1991 to 2006 for the United Kingdom.<sup>6</sup> The SOEP is a representative panel study containing individual and household data in Germany from 1984 onwards. After German reunification in 1990 the study was expanded to the New German Laender. All household members are interviewed individually once they reach age 16. The sample design ensures representativeness by oversampling special subpopulations. These include subsamples of guest workers from 1984 onwards, immigrants starting in 1994 and high income households from 2002 on.<sup>7</sup>

The SOEP provides several income figures both monthly and annually. However, not all monthly income concepts are also available as annual statistics, and vice versa. Due to survey methods, monthly incomes date back to the year the interview took place and annual incomes to the previous year. Annual incomes are divided by 12 to allow for comparisons between variances of monthly and annual incomes. All earnings and incomes are put into 2005 CPI-adjusted Euros.<sup>8</sup>

On an individual level, the difference between gross and net earnings reflects the stabilizing effect of progressive taxation and the compulsory social security system (Fabig, 1999). Insurance payments received from the social security system, for example unemployment benefits, tend to smooth the individual income volatility furthermore. Ultimately, the country-specific tax and transfer system determines the way in which a given shock to individual gross earnings translates into a change in individual disposable income, as Dolls *et al.* (2011) argue.

Table 1 depicts the income concepts considered, reflecting different scopes of government intervention: gross earnings (1) and (4) reveal the pure labor market outcome; adjusted gross earnings (5) including unemployment benefits signal the stabilizing effect of the individual's unemployment insurance; net earnings (2) reflect the volatility-reducing effect of a progressive tax system<sup>9</sup> and social security contributions; gross household income (6) reveals stabilizing effects of income pooling within households and net household income (3); and (7) allows conclusions about the equalizing and stabilizing role of social transfers beyond household income pooling.

<sup>6</sup>To make the read more convenient, the BHPS is described separately in Section 4.2 in detail.

<sup>7</sup>See Haisken-DeNew and Frick (2005), Frick (2006), and Wagner *et al.* (2007) for further details.

<sup>8</sup>Variances were also calculated using growth-adjusted incomes to check the robustness of the variances to income growth. The resulting variances are slightly lower when compared to variances based on price-adjusted incomes, but overall the results exhibit the same trends.

<sup>9</sup>Given the possibility of joint income tax assessments for couples in Germany, the progressivity of the tax system depends on the individual household situation.

TABLE 1  
INCOME CONCEPTS IN THE SOEP

Income Concept	Description	Monthly	Annual
<i>Incomes at individual level</i>			
Gross earnings	Gross labor market earnings	(1) <sup>a</sup>	(4)
Adjusted gross earnings	Gross earnings + unemployment benefits		(5)
Net earnings	Gross labor market earnings – income taxes – social security contributions	(2)	
<i>Incomes at household level</i>			
Gross household income	Equivalent <sup>b</sup> household income before taxes and public transfers including labor earnings, asset income, private retirement and private transfers		(6)
Net household income	Gross household income – taxes <sup>c</sup> + public transfers <sup>d</sup> , equivalized <sup>b</sup>	(3)	(7)

Notes: <sup>a</sup>(#) denotes number of income concept if income is available on monthly or respective annual basis.

<sup>b</sup>Equivalent household income is derived using *OECD modified equivalence scale* that assigns a value of 1 to the household head, 0.5 to each additional adult member, and 0.3 to each child.

<sup>c</sup>Taxes include income taxes and social security contributions for health, unemployment, retirement insurance, and nursing home insurance taxes (Grabka, 2009, p. 42).

<sup>d</sup>Public transfers include housing allowances, child benefits, subsistence assistance from the Social Welfare Authority, special circumstances benefits from the Social Welfare Authority, government student assistance, maternity benefits, unemployment benefits, unemployment assistance, and unemployment subsistence allowance (Grabka, 2009, p. 42).

Source: German Socio-Economic Panel (SOEP).

We use five-year windows ranging from 1984 to 2009 for monthly incomes and from 1983 to 2008 for annual incomes to identify changes in the variances. Each five-year period is centered on the middle year of the window. That is, 1986 denotes the base year of the five-year window 1984–88. West German males aged between 20 and 59 and in the labor force serve as the basis for the analysis.<sup>10</sup> Women, students, and severely disabled persons are excluded in order to avoid distortions.<sup>11</sup> The high income sample starting only in 2002 is excluded as well to avoid wrongly attributing higher recent variances to the larger number of high incomes in the sample.<sup>12</sup> To account for the stabilizing effect of unemployment, observations with zero earnings are included in the sample if they receive unemployment benefits; otherwise, they are dropped. Men for whom the information on at least one income concept is missing are eliminated, as are men who participated in the SOEP only once within a five-year period. We use an unbalanced panel with men who provided income information for at least two years within a five-year period. Using a balanced panel would potentially overestimate stability of income (Cappellari, 2004). In addition, the top and bottom 1 percent of the income

<sup>10</sup>East Germans experienced elevated levels of volatility (and permanent inequality) after reunification. Hence, including East Germans would deliver a distorted picture of Germany as a whole. Figures presenting the development of permanent and transitory variances in Germany, including East German males, are given in Figures A5 and A6 in the Appendix.

<sup>11</sup>Women indeed reveal far higher earnings volatility than men as can be taken from Figures A3 and A4 in the Appendix.

<sup>12</sup>Results for variances including the high income sample are given in the Appendix in Figures A1 and A2. Transitory variances do not change much, but permanent variances of both gross earnings and net household income are higher when including the high income sample.

TABLE 2  
NON-WEIGHTED NUMBER OF OBSERVATIONS FOR SELECTED BASE  
YEARS

Group	Base Years				
	1986	1991	1996	2001	2006
Males	3739	3290	3008	5083	4362
Schooling	968	901	693	664	496
Vocational qualification	2346	1958	1821	3297	2809
University	366	360	422	930	905
20–24 years	541	434	277	390	301
25–29 years	546	608	546	507	399
30–34 years	585	555	707	915	586
35–39 years	615	504	543	1120	893
40–44 years	592	519	448	988	996
45–49 years	589	380	349	627	666
50–54 years	474	529	322	634	630
55–59 years	332	319	297	429	474
Single	325	305	286	615	596
Couple without children	770	764	744	1189	1138
Couple with children	2141	1704	1564	2623	2073
Other	702	718	570	831	822

*Source:* German Socio-Economic Panel (SOEP), own calculations.

distribution are dropped.<sup>13</sup> On average, individuals participate four and a half years of each five-year period and ten years over the entire time horizon.

We subdivide the population into several demographic groups to control for differences arising from the level of education, income class, age, and household type. We define three educational levels as schooling, schooling plus vocational qualification, and university degree. The second classification is income quartiles. The third grouping is by age: 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, and 55–59. Finally, three different household types are considered separately: singles, couples without children, and couples with children. Education, age, and household group sizes do not add up to the total number of males participating in a period because males could change groups within one period and thus could be counted twice. For example, they could be part of a younger age group in the beginning of the period and part of an older one at the end.

For selected base years, Table 2 depicts the sample description. Due to panel attrition, sample sizes decrease for the first three periods. In 1998 and 2000 additional samples were drawn for replacement, thus explaining the increased sample size in base years 2001 and 2006. Still, cell sizes are higher than in comparable studies with different data requirements.

<sup>13</sup>Trimming data is common practice in the literature; see, for example, Gottschalk and Moffitt (2009). Trimming is based on the distributions of both monthly and annual net household income, i.e., observations in the highest and lowest percentile of the distribution of net household income were dropped. However, Van Kerm (2007) points out that results may be sensitive to different data adjustment procedures at the income distribution tails. Applying bottom-censoring at social welfare minimum (345 Euro net equivalent household income per month) or not trimming the data at all, leads to the same trends, although variance levels are slightly higher. All in all, results are robust. Censored and non-trimmed results can be provided by the authors upon request.



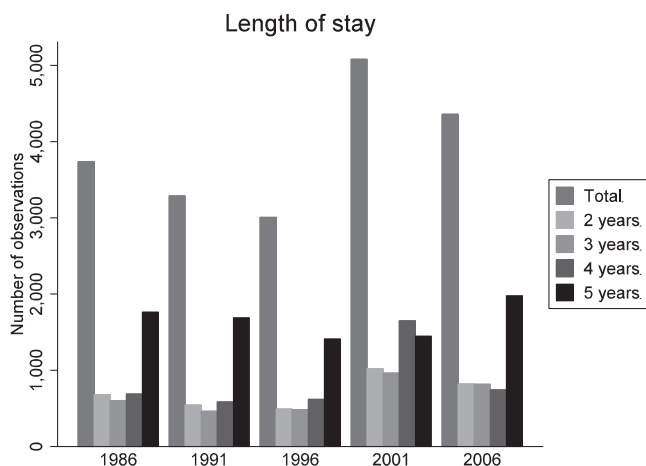


Figure 1. Panel Length of Stay for Selected Base Years

Source: German Socio-Economic Panel (SOEP), own calculations.

As pictured in Figure 1, panel attrition also occurs within a five-year period. The majority is observed for five years, but a non-negligible number is only observed for two, three, or four years. According to Biewen (2001) and Frick and Grabka (2005), item non-response on income questions in the SOEP is concentrated in the tails of the income distribution.<sup>14</sup> Non-response is only weakly associated with observable variables such as human capital variables, marital status, firm size, being foreign, and employed in public service (Biewen, 2001). Furthermore, Frick and Grabka (2005) point out that income inequality and income volatility is underestimated when restricting the sample to observed income components only. Consequently, we use imputed values provided by SOEP in addition to observed income to produce more reliable results.

## 4. RESULTS

### 4.1. *Income Volatility in West Germany*

Figures 2 to 5 exhibit the general picture for the Old German Laender. Transitory and permanent variances are calculated for each five-year window starting with 1984–88 and ending at 2005–09. Variances are indicated by their central year, e.g., 1986 for the first period. Henceforth, permanent variance and permanent inequality are treated as synonyms, as are transitory variance, instability, and volatility. Like other survey data, the SOEP contains a significant amount of measurement error. Therefore, results must be interpreted with caution where appropriate.

Figure 2 depicts the development of transitory and permanent variances of monthly and annual gross earnings, respectively. First, we comment on transitory variances marked by black triangles and enclosed with dotted lines denoting Hall's

<sup>14</sup>To reduce the impact of sample attrition on our results, we trim the data (see footnote 13).

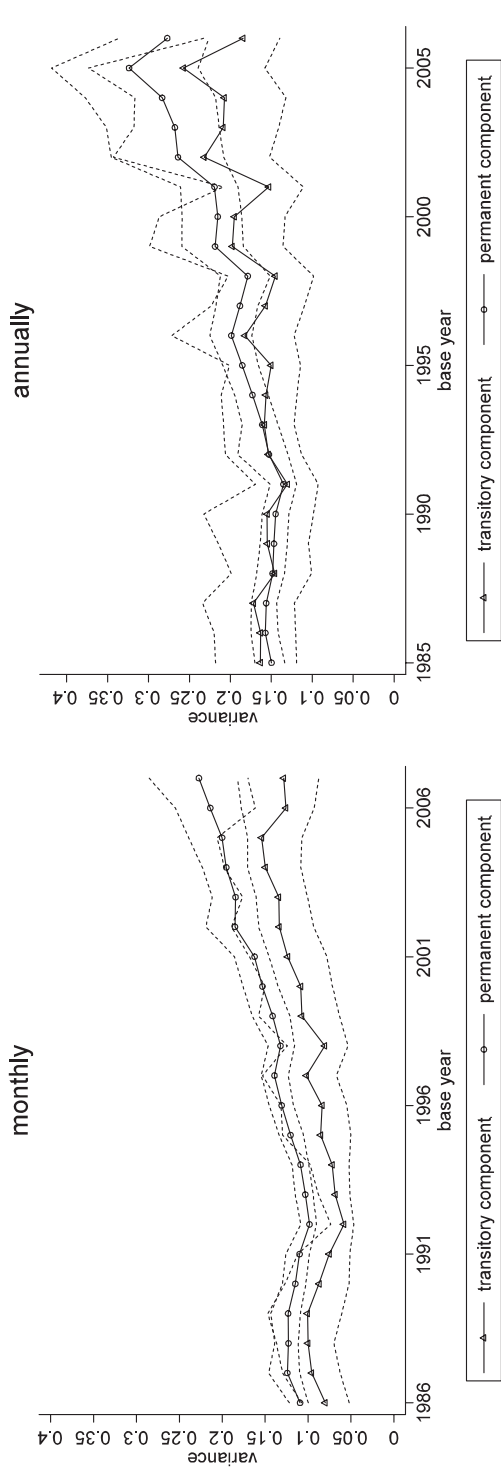


Figure 2. Transitory and Permanent Variances of Real Gross Earnings

Notes: Incomes are deflated by CPI to prices (in Euros) of 2005. Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Year denotes the base year. Dotted lines denote Hall's bootstrap confidence intervals at 95% level.

Source: German Socio-Economic Panel (SOEP), own calculations.

(1994) bootstrap confidence intervals at the 95 percent level.<sup>15</sup> Gross earnings become significantly more unstable over the period under investigation. Volatility remains relatively stable until 1998 and increases more steeply afterwards. The trend of rising volatility in the early 2000s is also suggested by Myck *et al.* (2011) using hourly wages. This finding of rising earnings volatility is in line with the expected impact of deregulation and globalization on the German labor market.

For permanent variances over time, we find that permanent inequality rises between 1984 and 2009 for both monthly and annual gross earnings. As seen for transitory variance, permanent variances rise after 1992 and again, even more sharply, after 1998. But after 2005 permanent variance of monthly gross earnings continues to rise, whereas it falls for annual gross earnings. Similar findings are reached by Daly and Valletta (2008) in their analysis with SOEP annual earnings up to 1999. They document a continuous rise in permanent earnings inequality in West Germany through the 1980s and 1990s with a sharp rise after 1998 and an increase in earnings volatility between 1991 and 1999. Given the changing economic parameters, this development does not come as a surprise: technological change and a more globalized economy reduce the demand for the low-skilled. Hence, remuneration of high and low skilled labor is likely to get more dispersed (Autor *et al.*, 2008).

To address how the structure of the aforementioned rising cross-sectional inequality in Germany has evolved over time, we look at the shares of transitory and permanent variances. We find that the permanent variance of gross earnings is about 60 percent of overall variance, as indicated in Figure 2. This implies that permanent inequality is the main explanation for the cross-sectional earnings inequality, whereas volatility explains a smaller part. Myck *et al.* (2009) find a similar structure of overall variance. They confirm a rising cross-sectional variance of hourly wages primarily caused by rising permanent inequality, increasing continuously up to 80 percent in 2001. However, according to their estimations a decline of the permanent component share occurs for subsequent years, reaching 60 percent in 2006.

Figures 3 and 4 depict the variances of different income concepts to uncover the role of taxes, public transfers and household income pooling. Transitory variances of monthly and annual income are presented in Figure 3. The left graph shows rising volatility of both gross and net monthly earnings. The difference between volatility of gross and net earnings reflects the individual's insurance against volatility provided by a progressive tax system and social security contributions. In contrast, variances of net income remained fairly stable throughout the period under examination. Calculations based on annual earnings show roughly the same picture. Comparing gross earnings to adjusted gross earnings suggests that unemployment benefits reduce volatility by about one half. But income pooling within the households (gross household income) combined with public

<sup>15</sup>To indicate the statistical significance of the results, we use the bootstrap method (Mills and Zandvakili, 1997). We draw  $B = 200$  random samples with replacement from all observations within a certain period, e.g., five years. Each bootstrap sample contains as many sampling units as the original sample. Moreover, we implement stratified bootstrap sampling to account for the survey design of the SOEP. For a thorough discussion of the implications for bootstrapping inequality indices derived from panel data, see Biewen (2002).

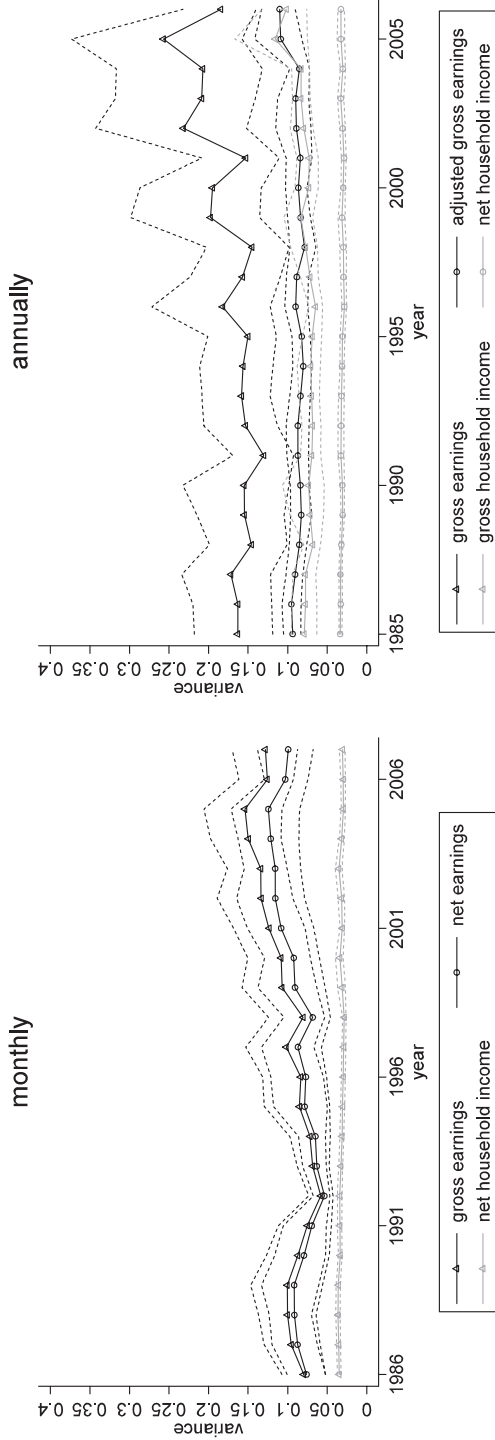


Figure 3. Transitory Variances of Real Income

Notes: Incomes are deflated by CPI to 2005 prices (in Euros). Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Year denotes the base year.

Source: German Socio-Economic Panel (SOEP), own calculations.

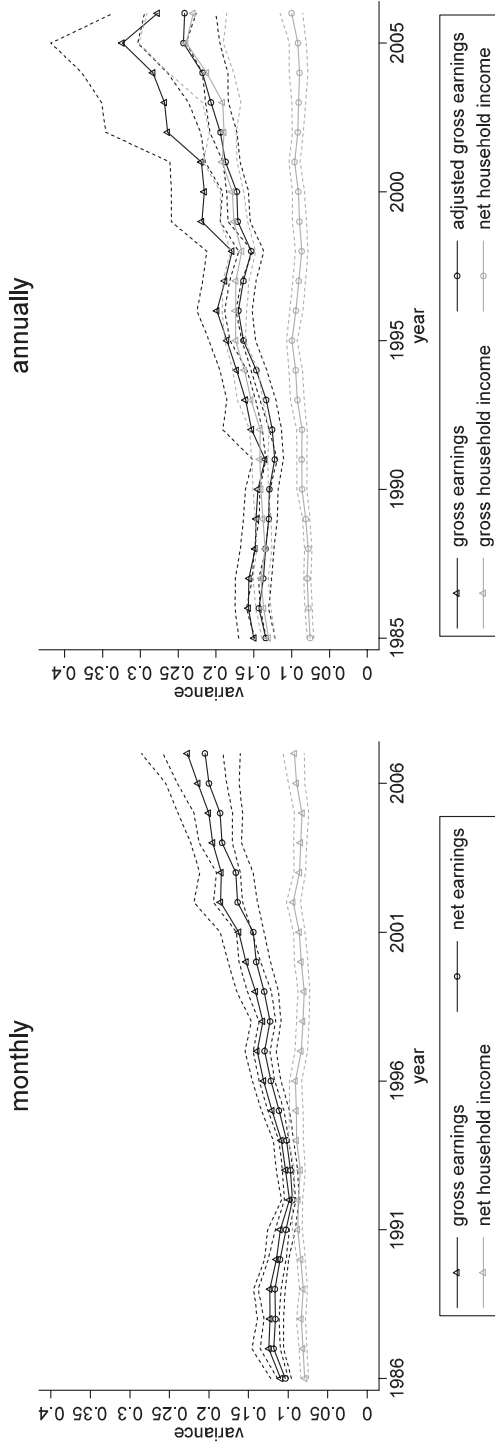


Figure 4. Permanent Variances of Real Income

Notes: Incomes are deflated by CPI to 2005 prices (in Euros). Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Year denotes the base year.

Source: German Socio-Economic Panel (SOEP), own calculations.

transfers and taxes (net household income) induces an even larger reduction of instability. Before 1995, volatility of net household income is about 20 percent of gross earnings volatility, after which the volatility difference between the two income concepts expands. Between the base years 2003 and 2006, volatility of net household income drops to around 14 percent of gross earnings volatility. Overall, income pooling and government intervention reduce the volatility substantially, and although the household structure changed substantially (Peichl *et al.*, 2012), insurance through income pooling only slightly diminishes.

Permanent variances of monthly and annual income are depicted in Figure 4. Permanent inequality of gross, net, and adjusted earnings is clearly rising, irrespective of the accounting period. With regard to monthly as well as annual income, we find that neither unemployment benefits nor household income pooling lead to a considerable reduction of permanent inequality. The increase in permanent inequality starting in 1998, when it demonstrates a sharp rise, coincides with macroeconomic growth accompanied by stagnating real wages. As Bach *et al.* (2009) document, in this period income growth is concentrated in the upper decile of the income distribution; median income is found to be declining and average income to be constant. But government intervention successfully contributes to evening out income differences: permanent inequality of both monthly and annual net household income remains fairly stable between 1984 and 2009.

A comparison of the transitory and permanent variance of net household income depicted in Figures 3 and 4 completes the picture. Contrary to claims of rising labor market insecurity and welfare state retrenchment, the German welfare state still reduces labor market volatility and permanent inequality. Estimations based on monthly and annual incomes lead to the same conclusion for both transitory and permanent variances. Households were protected from experiencing the full force of rising labor market volatility and growing permanent earnings differentials. Taxes, transfers, and household income pooling buffer rising earnings volatility and rising permanent earnings inequality. Given the increased exposure of the German economy to global market volatilities in the last 30 years, Rodrik's (1998) hypothesis of an expanded welfare state in light of an open economy seems to be confirmed.

Keeping in mind that cross-sectional variance is the sum of transitory and permanent variance, we find that up to base year 1989 about 70 percent of net household income inequality can be attributed to permanent differences. Figures 3 and 4 illustrate that this share has increased to more than 74 percent since the year 1994. This result is in line with Biewen (2005), who finds the permanent share of overall variance to be some 60 percent.

A comparison between the share of the permanent component in gross earnings and net household income variance reveals the effect of the German welfare state. In the case of gross earnings, the permanent component amounts to 60 percent and the transitory component to 40. By contrast, the share of the permanent variance of net household income amounts to 70 percent and accordingly, the transitory component accounts for 30 percent of overall variance. This indicates that the German welfare state reduces volatility to a larger extent than it does reduce permanent inequality. But still, a volatility share of 30 percent is not at all negligible.

Table 3 gives a detailed picture for selected base years, with asterisks indicating significant changes between five-year periods. The first panel gives point estimates for permanent and transitory variances of the three monthly income concepts, with differences between five-year periods given in percentages. The sixth and the last column, respectively, indicate the overall trend between 1984 and 2008. All changes of the permanent component over the full period under investigation are significant. Permanent inequality of gross earnings increases far more than permanent inequality of net household income. Transitory variances of gross earnings also increase and transitory variances of net household income even decrease over the time period. Overall inequality of gross monthly (annual) earnings as the sum of permanent and transitory variance rises from 18.93 (31.30) in 1986 to 33.97 (58.10) in 2006 by 79 (86) percent. Overall inequality of monthly (annual) net household income rises from 11.37 (10.89) in 1986 to 11.92 (12.43) in 2006 by 5 (14) percent. A steep increase in overall inequality is supported by various studies and for various inequality measures and income concepts for Germany (*inter alia* Bundesregierung, 2001, 2008; Frick und Grabka, 2008; Bach *et al.*, 2009; Fuchs-Schündeln *et al.*, 2010; Peichl *et al.*, 2012).<sup>16</sup>

#### 4.2. *Income Volatility in the United Kingdom*

How do patterns for the United Kingdom compare with those of Germany? We use the British Household Panel Survey (BHPS), which is a longitudinal survey started in 1991, covering around 5000 households and similar to the German SOEP. The actual numbers of observations are given in Table 4. To get a picture of the extent to which the more liberal British welfare state reduces permanent income differences and stabilizes incomes as opposed to the German case, we compute income concepts according to Table 1, namely annual gross earnings (4), gross household income (6), and net household income (7). To yield analogous variance estimates, all incomes are CPI and PPP adjusted to match German CPI inflated incomes.<sup>17</sup>

Permanent and transitory variances of annual gross earnings are presented in Figure 5 and find its pendant in Figure 2 for the German case. Both components exhibit a rising trend between 1993 and 2004. The permanent component is slightly smaller than the transitory component. The share of permanent variance amounts to approximately 48–38 percent of overall variance, a result confirmed by Daly and Valletta (2008). However, transitory variances seem to play a larger role in explaining total earnings variance than permanent variances. The closest study to ours regarding income volatility in the United Kingdom is probably Jenkins (2011). Applying (almost) the same methodology, he finds the permanent component rising and the transitory component remaining rather stable over the period from

<sup>16</sup>The increase of total variance of annual gross earnings (net household income) in our data corresponds to a non-age-adjusted Gini of 0.2390 (0.1907) in 1986 and 0.3057 (0.2161) in 2006 by 28 (13) percent. This result is in line with Bundesregierung (2001, 2008) who find a Gini increase of gross earnings (net household income) from 0.3065 (0.2464) in 1983 to 0.453 (0.316) in 2005 by 48 (28) percent. Differences in Gini estimates are attributed to a more homogeneous sample in our case.

<sup>17</sup>Unfortunately, data to calculate monthly income concepts (1), (2), and (3) as well as annual adjusted gross earnings (5) is not provided in the BHPS-CNEF dataset. To guarantee comparability with the German results, we stick to income concepts (4), (5), and (7).

TABLE 3  
 VARIANCES OF REAL MONTHLY AND ANNUAL INCOME

Base year	Permanent Variance <sup>a</sup> Percent Change <sup>b</sup>						Transitory Variance <sup>a</sup> Percent Change <sup>b</sup>					
	1986	1991	1996	2001	2006	1986–2006	1986	1991	1996	2001	2006	1986–2006
<i>Monthly income</i>												
Gross earnings	10.94	10.99	13.08	16.23	21.40		7.99	7.51	8.36	12.36	12.57	
		0.44	18.97*	24.12*	31.81*	95.49*		-5.97	11.25	47.90	1.74	57.41*
Net earnings	10.36	10.28	12.18*	14.40	20.01		7.62	6.96	7.71	10.83	10.31	
		-0.78	18.55	18.25*	38.91*	93.20*		-8.67	10.73	40.49	-4.77	35.30
Net household income	7.88	8.76	9.09	8.59	8.95		3.49	3.41	2.97	3.11	2.97	
		11.25*	3.74	-5.49	4.15	13.60*		-2.41	-13.01*	4.82	-4.43	-14.96*
<i>Annual income</i>												
Gross earnings	14.98	14.46	18.55	21.54	32.39		16.32	15.49	15.01	19.49	25.72	
		-3.41	28.21*	16.13	50.38*	116.26*		-5.06	-3.11	29.86	31.92	57.59
Adjusted gross earnings	13.42	12.93	16.36	17.23	24.30		9.38	8.40	8.22	8.67	10.88	
		-3.66	26.57*	5.32	40.99*	81.07*		-10.45	-2.06	5.39	25.58	16.06
Gross household income	13.07	14.06	17.39	17.84	23.96		7.91	7.36	6.91	7.34	11.56	
		7.54	23.67*	2.61	34.31*	83.28*		-6.93	-6.20	6.27	57.57	46.18
Net household income	7.54	8.61	9.95	9.11	9.16		3.35	3.10	3.08	2.97	3.27	
		14.17*	15.64*	-8.46*	0.53	21.50*		-7.54	-0.65	-3.64	10.40	-2.28

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Year denotes the base year.

<sup>a</sup>Incomes are deflated by CPI to 2005 prices (in Euros). For editorial reasons variances are multiplied by 100.

<sup>b</sup>Percent Change is measured as the difference between two subsequent five-year periods.

\*Significant at the 95%-level.

Source: German Socio-Economic Panel (SOEP), own calculations.



TABLE 4  
NON-WEIGHTED NUMBER OF OBSERVATIONS FOR BASE YEARS

	Males Aged 20–59
1993	2663
1994	2588
1995	2598
1996	2797
1997	2898
1998	3607
1999	3876
2000	4306
2001	4421
2002	4375
2003	4126
2004	3979

Source: British Household Panel Study (BHPS-CNEF), own calculations.

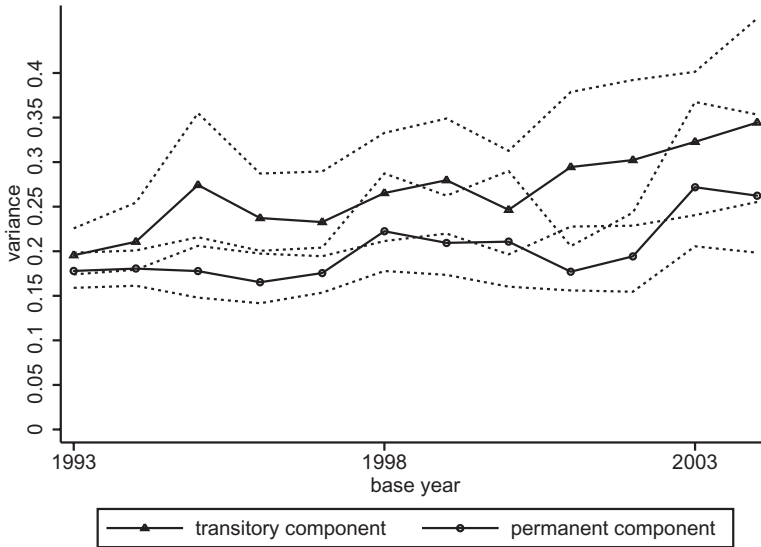


Figure 5. Transitory and Permanent Variances of Real Earnings

Notes: Incomes are deflated by CPI to 2005 prices (in Euros). Only males in the workforce are considered; severely disabled persons are excluded. Year denotes the base year.

Source: British Household Panel Study (BHPS-CNEF), own calculations.

1994 to 2003.<sup>18</sup> However, in contrast to our results, he finds the transitory component to explain some 30 percent of overall variance. This is especially attributed to Jenkins’ (2011) exclusion of the young and the old. In particular, the young and the old experience higher transitory shocks as they either start their career or are

<sup>18</sup>The main differences are the time window of seven years to calculate the permanent variance, the income adjustments, and a sample covering the men aged between 25 and 55. Still, while levels may not be comparable, trends and shares should point in the same directions.

in the transition to retirement. In sum, our findings for the United Kingdom contrast the picture we portray for Germany in two ways: starting at a higher level, permanent variance is stable or at best modestly increasing—a trend already documented by Daly and Valletta (2008) for the 1990s; and the transitory component exceeds the permanent.

Figure 6 gives transitory and permanent variances for different income concepts considering household income pooling and welfare state intervention, and corresponds to the annual graphs in Figures 3 and 4. The redistributive and stabilizing effect of the welfare state and income pooling is clearly identifiable. The transmission from gross earnings to net household income reveals the insurance against transitory income shocks provided by households: the transitory variance is halved by means of income pooling. Permanent differences, however, are not absorbed by households. Considering the permanent and transitory variance of net household income discloses to what extent the welfare state absorbs transitory shocks and redistributes income. Both the transitory and the permanent component are reduced to half the size of gross household income. Furthermore, rising economic volatility and permanent inequality of individual gross earnings do not go through to net household income. Once more, due to the differences in methodology mentioned above, Jenkins' (2011) results exhibit the same trend, namely fairly stable variances for household incomes, but slightly lower levels.

Again, the picture is somewhat different to Germany. In the United Kingdom, especially for transitory variances, the stabilizing effect of the household is not negligible and more important than in Germany. The important buffering effect of income pooling for Anglo-Saxon economies is also supported for the U.S. by Gottschalk and Moffitt (2009). They state that in multi-earner families, the increase in volatility of head-of-household earnings can be offset by spouses' earnings. In contrast to our results for Germany and the United Kingdom, they find that after reforming the welfare system in the 1990s, transfers fostered volatility of household income in the U.S. Furthermore, unlike Germany the United Kingdom did not experience a steep increase in permanent inequality.

To assess the picture completely, the transitory and permanent variances of net household income in Figure 6 have to be compared. The annual graphs of Figures 3 and 4 depict the results for Germany. Both components remain quite stable between 1993 and 2004, and although the methodology differs slightly, magnitudes of the results match the figures reported by Jenkins (2011). Compared to Germany, it stands out that in the United Kingdom the share of the transitory component is higher and, taking overall volatility reduction from gross earnings to net household income into account, both redistribution and insurance in Germany are more pronounced.

The overall picture of permanent and transitory variance and the role of the welfare state is conclusive. For instance, OECD (1996) finds for the countries Sweden, Germany, United Kingdom, and U.S., about two thirds of cross-sectional inequality is persistent, whereas one third is explained by transitory factors. Gottschalk and Moffitt (1994) also find that the permanent component of earnings in the U.S. amounts to about two thirds of cross-sectional variance between 1980

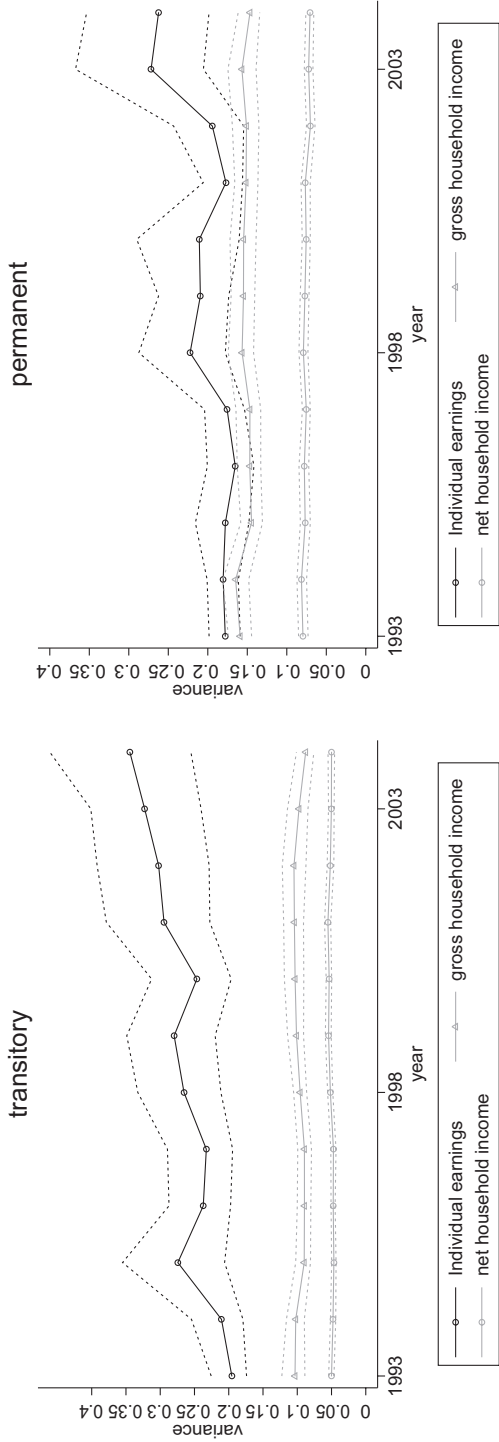


Figure 6. Transitory and Permanent Variances of Real Income

Notes: Incomes are deflated by CPI to 2005 prices (in Euros). Only males in the workforce are considered; severely disabled persons are excluded. Year denotes the base year.

Source: British Household Panel Study (BHPS-CNEF), own calculations.

and 1987. Furthermore, the more pronounced distributional effect of the German welfare state is well documented in the literature. Amongst others, Chen (2009) confirms that the more progressive German tax system offsets earnings variations sizably compared to the U.S. and United Kingdom. The findings regarding net household income are in the same direction. Following Van Kerm (2003), volatility levels of German net household income are low relative to other European countries. He compares volatility of annual net equivalent household income in Europe, and finds West German income variability far below the reference country United Kingdom. Among 16 European countries, only Austria and Hungary have less income variability than West Germany. Ireland, Portugal, and Spain reveal the most volatile income patterns.

#### 4.3. *Income Volatility and Income Classes*

Our evidence thus far is not indicative of growing insecurity in Germany. Further disaggregation is necessary to investigate whether certain groups are indeed affected by growing insecurity, which has not become apparent considering average variances. This might be particularly plausible for lower income classes, singles, and younger age groups. Due to space limitations, we refrain from reporting results based on annual concepts for all subgroups except those for household types. Qualitatively, variances of both monthly and annual income give the same results.

Ordering the population within a five-year period by their permanent earnings level, we find that the lowest quartile experiences substantially higher earnings volatility. Figure 7 illustrates that gross earnings volatility of the lowest quartile is more than twice as high as average volatility reported in Table 3, rising to three times as high after 1994. In contrast, earnings volatility in the second, third, and fourth quartile is less than one half of average volatility, and only about a quarter between 1999 and 2003. In the last period earnings volatility of the middle quartiles rises to half of average. Whether the observed volatility levels for the lowest quartile are harmful depends on its source. First, this might be indicative of an increasingly volatile and expanding low-wage sector due to reductions in social assistance and increased work incentives for recipients of unemployment benefits. Then, the observed trend is due to institutional changes and alarming. Second, high volatility goes hand in hand with job mobility typically experienced by individuals at the beginning of their working-life career. In this career stage, job changes are more frequent and a relative low income is earned. Whether the young and their mobility are the source will be discussed in Section 4.4. Interestingly, Gottschalk and Moffitt (2009) find the same pattern for the U.S. Transitory variances of the lowest quartile are two to three times higher than for those in the upper quartile.

Turning to net household income, we find that volatility levels of the lowest quartile are still substantially reduced by the intervention of the welfare state despite the cut-back on social assistance. Altogether, income groups experience quite similar levels of instability. Indeed, the source of income variation could differ between these income groups: while households in the upper quartile may be more likely to change jobs voluntarily or even to stop working for some time,

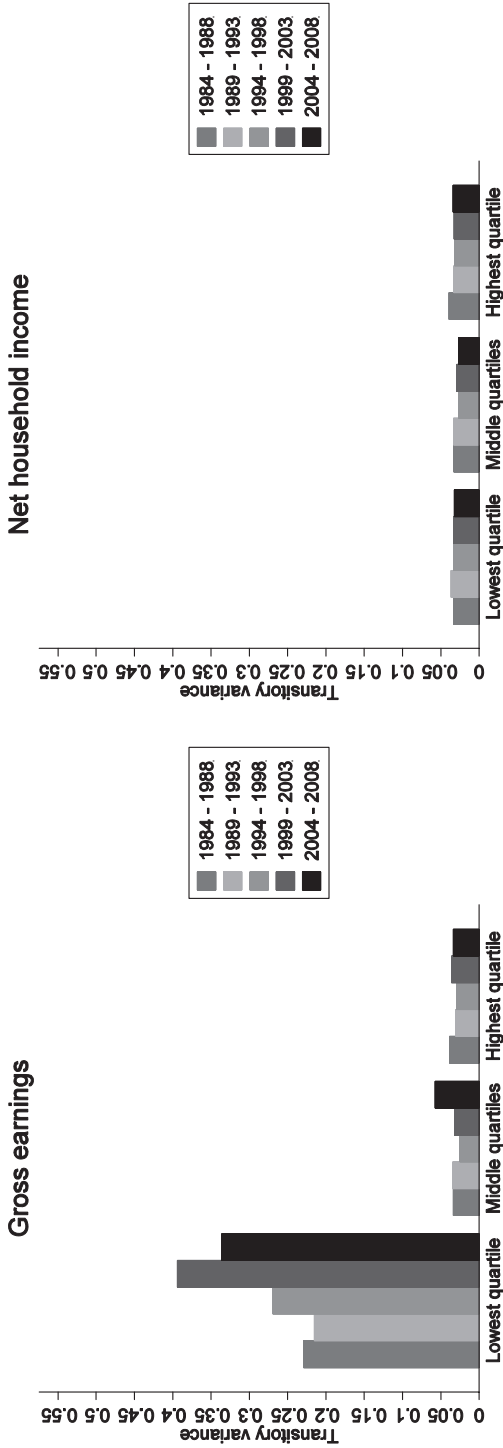


Figure 7. Transitory Variances of Real Monthly Income, Income Quartiles, 1984–2008

Notes: Quartiles are based on permanent components of income. Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Year denotes the base year. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.

households in the lowest quartile may more likely experience income volatility due to involuntary job loss. Higher importance of asset income may be another source of volatility for the highest quartile. Whereas the share of asset income in net household income is quite similar for the lower three quartiles, it is nearly twice as large for the upper quartile.

Van Kerm (2003) confirms that although West German net household incomes show low levels of volatility for most of the population, the poorest segments reveal exceptionally high fluctuations comparable to volatility levels in a low-wage country like Poland. In light of the liquidity constraints almost surely facing low income households, this result may be even more troubling (Gottschalk and Moffitt, 2009).

#### 4.4. *Income Volatility and Age*

As can be seen from Figures 8 and 9, the youngest age group considered—individuals 20 to 24 years old—shows the highest level of earnings volatility and the highest dispersion of permanent gross earnings throughout the period. On the whole, the correlation between age and both transitory and permanent variance of gross earnings appears to be u-shaped, confirming the pattern Mincer (1974) established.

Younger persons experience higher earnings volatility at the beginning of their career reflecting, among other things, a productive and voluntary search for better jobs. This pattern is also found by Sologon and O'Donoghue (2010) across European countries. Following Topel and Ward (1992), two thirds of the job changes occur during the first ten years in the labor market. Results by Davia (2005) underline the attractiveness of more frequent job changes for young people. She finds that young workers who change employers, on average achieve a higher wage than those who remain with the same employer. As young people typically earn wages in the lowest quartile, the volatility of their earnings can explain a large share of the high volatility in the lowest income quartile. Employees leaving the labor market experience a change regarding their earnings profiles. Either they are more likely to experience periods of unemployment, or they retire. Consequently, they undergo negative income shocks.

Household income pooling, family support, and welfare state intervention successfully evens out volatility differences between age groups, particularly in light of the high transitory variances of gross earnings of the youngest age group. Although net household income of younger age groups is slightly more unstable, levels are quite similar over all age groups.

Earnings dispersion is high among income earners starting their career due to the wide range of occupational choices. In the first years of work experience—the age group 25–29—earnings are less dispersed. In older groups, the gap between the education-specific earnings profiles widens. Path dependencies of decisions made in the early stages of the career become apparent, and hence dispersion is increasing in age. As transitory changes become less frequent over the life-cycle, permanent inequality gains importance in the overall cross-sectional inequality, a pattern confirmed by Sologon and O'Donoghue (2010). Fuchs-Schündeln *et al.* (2010) also find this u-shaped pattern for earnings inequality. Dispersion of net household

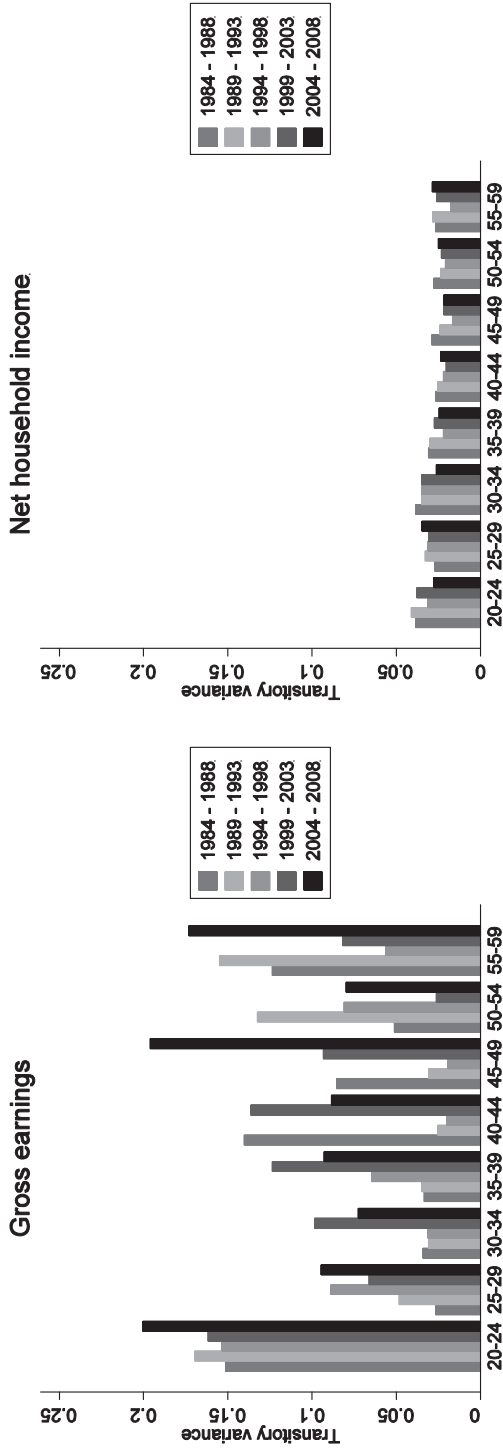


Figure 8. Transitory Variances of Real Monthly Income, Age Groups, 1984–2008

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.

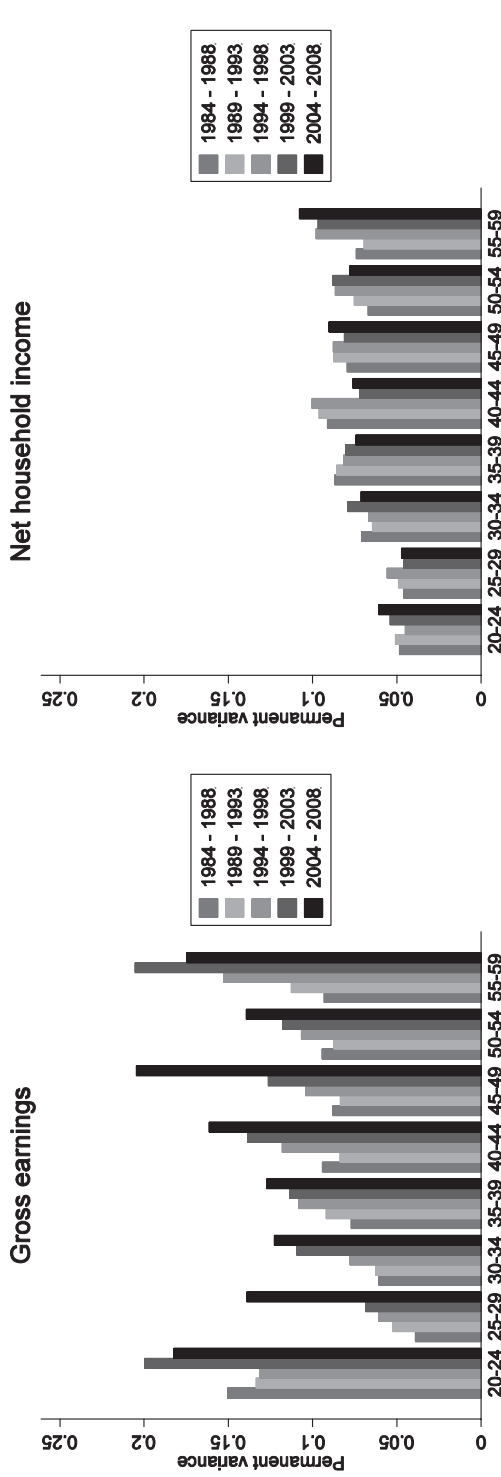


Figure 9. Permanent Variances of Real Monthly Income, Age Groups, 1984-2008

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.



income is highest within the oldest age group. The relatively low permanent variance of net household income within the youngest age group shows a strongly equalizing impact of social transfers and family support next to their important function as a stabilizer for this age group. Interestingly, permanent inequality within age groups is below the average permanent inequality listed in Table 3, and is also below the permanent inequality of most of the education and household classes. Hence, age groups appear to be the most homogenous demographic income group.

#### 4.5. *Income Volatility and Education*

Transitory variances for different education groups are presented in Figure 10. Between 1984 and 1998, persons with only schooling show the highest earnings volatility. Since 1998, those with a university degree also experience elevated levels of earnings volatility. In three out of five periods a vocational qualification seems to predict more stable earnings, as this group's transitory variance is below those of the other education groups. This may be due to the fact that job changes are more costly for trained workers who accumulate firm-specific skills which are not entirely transferable, as Bougheas and Georgellis (2004) accentuate. The loss of accumulated firm-specific skills is higher the longer a worker has stayed with a firm. Differences between education levels are less pronounced, if net household income is considered. But in three out of five periods net household income of persons with only schooling is the most unstable.

As Figure 11 shows, permanent earnings are distributed most unequally between those with only schooling in four out of five periods, followed by those with a university degree. The distribution of permanent earnings of those with an apprenticeship is more compressed, covering a smaller range. Again, differences between permanent net household incomes seem to be quite similar over subgroups. The higher permanent inequality can be explained by more household heterogeneity: university education obviously covers the range from high income singles living alone to single earner households with moderate income.

#### 4.6. *Income Volatility and Household Groups*

Since households with more than two income earners, unlike individuals living alone, can stabilize their economic situation through income pooling in the event one earner experiences an income shock, a disaggregated look at different household types seems necessary. Indeed, Shore (2010) finds that the earnings risk faced by a husband is substantially reduced by adding the wife's earnings. Furthermore, household income volatility may also reflect ongoing changes regarding the household formation in Germany. Average household size has decreased sharply. Higher risk of divorce and a lower frequency of marriage increased the number of one-person households. Hence, the aforementioned impact of income pooling applies to fewer and fewer households. In addition, the number of childless couples, especially in the higher income brackets, has grown. Variances of annual

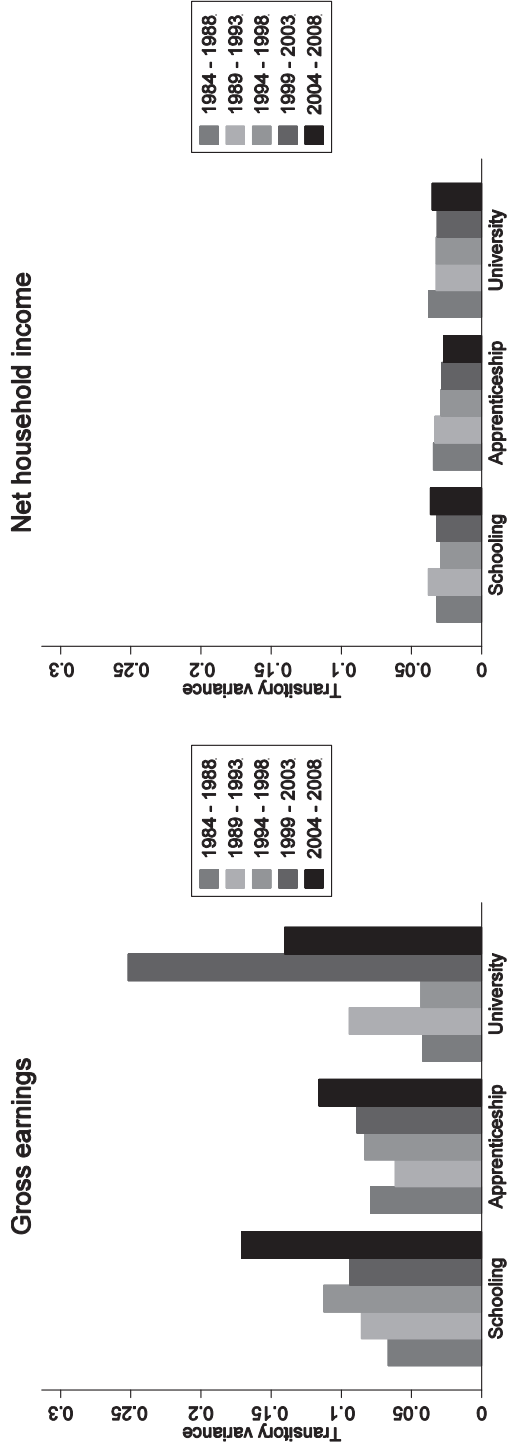


Figure 10. Transitory Variances of Real Monthly Income, Education Level, 1984–2008

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.

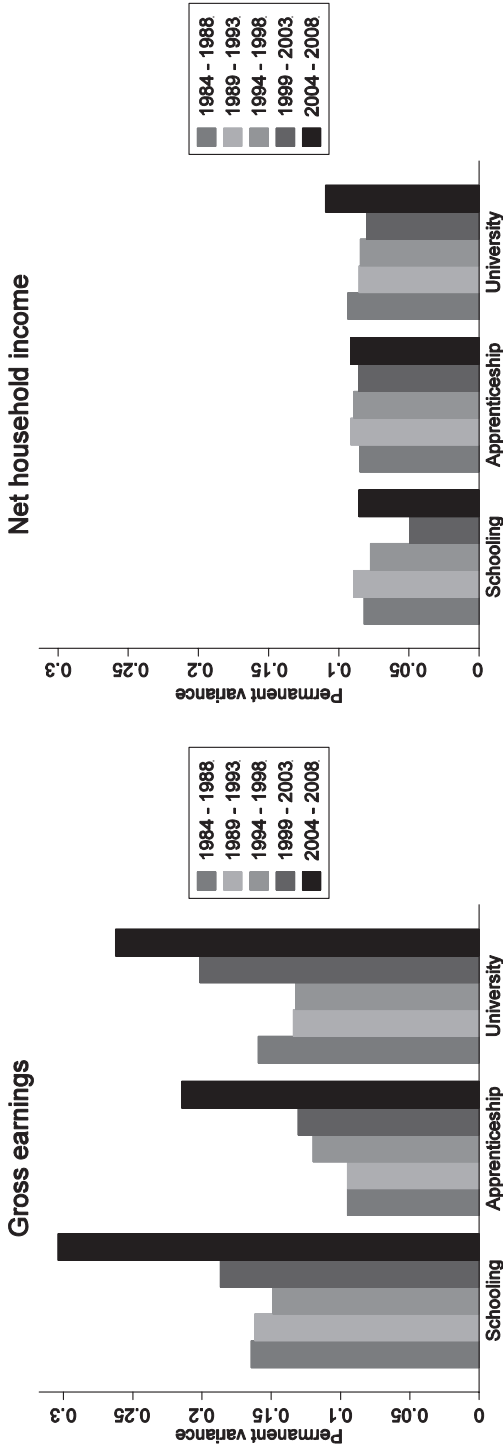


Figure 11. Permanent Variances of Real Monthly Gross Income, Education Level, 1984-2008

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.

incomes are considered because household income before and after government intervention is only available on an annual basis.

Figure 12 illustrates that in four out of five periods gross household income volatility is at least twice as high for singles as for couples. This finding demonstrates the importance of income pooling in reducing household risk. Volatility of net household income is more or less the same for the three household types. The sharp rise for singles in the last period stands out.

Gross household income dispersion grows over time for all three household types, but does so most sharply for the increasing number of single households, as can be seen in Figure 13. Peichl *et al.* (2012) emphasize that the increasing inequality in Germany is related to the change in household formation, specifically, the rising number of one-person households. Interestingly, income dispersion also rises quite steadily for all household types when taking taxes and transfers into account. This occurs in contrast to age and education groups, who revealed no clear trend of growing permanent inequality of net household income.

## 5. CONCLUSION

We analyze permanent and transitory variance of male earnings and equivalent household income for Germany from 1984 to 2009 and for the United Kingdom from 1991 to 2006. In Germany, both permanent and transitory variances of gross earnings have increased substantially over the period under observation. For Anglo-Saxon economies like the U.S., United Kingdom, and Canada, increasing earnings volatility is stated in many studies. Examining the German case, we find that even a country with traditionally more pronounced labor market regulation is hit by rising earnings volatility, a pattern supported by Gustavsson's (2008) evidence for Sweden. Individuals may thus be justified in perceiving greater uncertainty due to labor market reforms and globalization.

Comparing gross earnings variances with the variances of net household income sheds light on the insurance and redistribution of welfare states as well as income pooling within households. In contrast to gross earnings, both permanent and transitory variances of net household income have remained stable in Germany and the United Kingdom. Despite growing earnings volatility and inequality, both welfare states are able to provide the same level of stability and redistribution over time. However, contrasting the United Kingdom to Germany reveals both higher earnings volatility and less insurance provided by the British welfare state. In addition, redistribution is less pronounced than in Germany.

Furthermore, the increase in permanent and transitory earnings variance is experienced very differently by population subgroups. For instance, being a low income earner, young, and single, increases the risk of facing higher earnings volatility. Still, taking the welfare state and its institutions into account, we find that subgroup specific volatility of net household income has remained quite stable, in contrast to the development of earnings. Hence, the German welfare state is able to insure employees against rising insecurity.

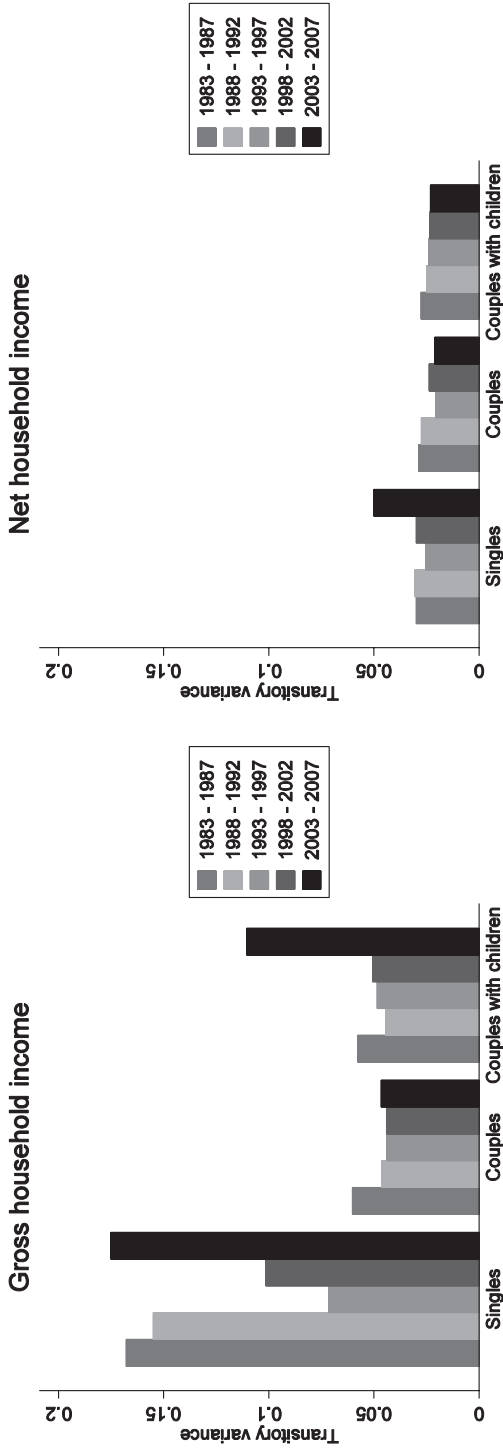


Figure 12. Transitory Variances of Real Annual Income, Household Types, 1983–2007

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.

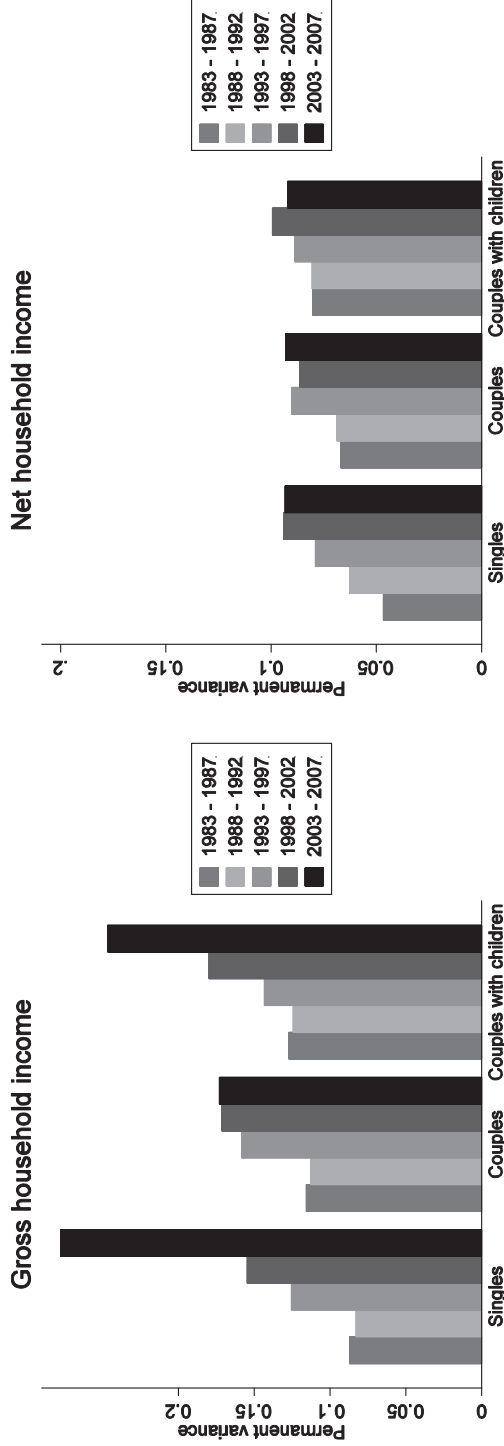


Figure 13. Permanent Variances of Real Annual Income, Household Types, 1983–2007

Notes: Only males in the workforce and with residence in the Old German Laender are considered; students and severely disabled persons are excluded. Incomes are deflated by CPI to 2005 prices (in Euros).

Source: German Socio-Economic Panel (SOEP), own calculations.

In sum, the German as well as the British welfare state focuses on reducing the transitory variance rather than redistributing permanent income. Taking a welfare point of view, the welfare states are an effective device for insuring households' disposable incomes and raising their expected utility.

## REFERENCES

- Autor, D., L. Katz, and M. Kearney, "Trends in U.S. Wage Inequality: Revising the Revisionists," *Review of Economics and Statistics*, 90, 300–23, 2008.
- Bach, S., G. Corneo, and V. Steiner, "From Bottom to Top: The Entire Income Distribution in Germany, 1992–2003," *Review of Income and Wealth*, 55, 303–30, 2009.
- Baker, M. and G. Solon, "Earnings Dynamics and Inequality among Canadian Men, 1976–1992: Evidence from Longitudinal Income Tax Records," *Journal of Labor Economics*, 21, 289–321, 2003.
- Barr, N., *The Economics of the Welfare State*, Oxford University Press, Oxford, 1998.
- Beach, C. M., R. Finnie, and D. Gray, "Long-Run Inequality and Short-Run Instability of Men's and Women's Earnings in Canada," *Review of Income and Wealth*, 56, 572–96, 2010.
- Biewen, M., "Item Non-Response and Inequality Measurement: Evidence from the German earnings distribution," *Allgemeines Statistisches Archiv*, 85, 409–25, 2001.
- , "Bootstrap Inference for Inequality, Mobility and Poverty Measurement," *Journal of Econometrics*, 108, 317–42, 2002.
- , "The Covariance Structure of East and West German Incomes and its Implications for the Persistence of Poverty and Inequality," *German Economic Review*, 6, 445–69, 2005.
- Blundell, R. and I. Preston, "Consumption Inequality and Income Uncertainty," *Quarterly Journal of Economics*, 113, 603–40, 1998.
- Bougheas, S. and Y. Georgellis, "Early Career Mobility and Earnings Profiles of German Apprentices: Theory and Empirical Evidence," *LABOUR*, 18, 233–63, 2004.
- Browning, E. and W. Johnson, "The Trade-Off between Equality and Efficiency," *Journal of Political Economy*, 92, 175–203, 1984.
- Bundesregierung, *Lebenslagen in Deutschland—der erste Armuts- und Reichtums-bericht der Bundesregierung*, Berlin, 2001.
- , *Lebenslagen in Deutschland—der dritte Armuts- und Reichtums-bericht der Bundesregierung*, Berlin, 2008.
- Cappellari, L., "The Dynamics and Inequality of Italian Men's Earnings: Long Term Changes or Transitory Fluctuations?" *Journal of Human Resources*, 39, 475–99, 2004.
- Chen, W., "Cross-National Differences in Income Mobility: Evidence from Canada, The United States, Great Britain and Germany," *Review of Income and Wealth*, 55, 75–100, 2009.
- Daly, M. and R. Valletta, "Cross-National Trends in Earnings Instability and Earnings Inequality," *Economics Letters*, 99, 215–19, 2008.
- Davia, M., "Job Mobility and Wage Mobility at the Beginning of the Working Career: A Comparative View across Europe," ISER Working Papers No. 2005-03, 2005.
- Dolls, M., C. Fuest, and A. Peichl, "Automatic Stabilizers, Economic Crisis and Income Distribution in Europe," *Research in Labor Economics*, 32, 227–56, 2011.
- Dynan, K., D. Elmendorf, and D. Sichel, "The Evolution of Household Income Volatility," *Brookings Papers on Economic Activity*, 2008.
- Dynarski, S. and J. Gruber, "Can Families Smooth Variable Earnings?" *Brookings Papers on Economic Activity*, 229–303, 1997.
- Fabig, H., *Einkommensdynamik im internationalen Vergleich: eine empirische Mobilitätsanalyse mit Panel-Daten*, Campus, Frankfurt a.M., 1999.
- Fortin, N. and T. Lemieux, "Institutional Changes and Rising Wage Inequality: Is There a Linkage," *Journal of Economic Perspectives*, 11, 75–96, 1997.
- Frick, J., "A General Introduction to the German Socio-Economic Panel Study (SOEP)—Design, Contents and Data Structure (waves A-V, 1984–2005)," German Institute for Economic Research, Berlin, 2006.
- Frick, J., and M. Grabka, "Item Nonresponse on Income Questions in Panel Surveys: Incidence, Imputation and the Impact on Inequality and Mobility," *Allgemeines Statistisches Archiv*, 89, 49–61, 2005.
- , "Schrumpfende Mittelschicht—Anzeichen einer dauerhaften Polarisierung der verfügbaren Einkommen?" *DIW-Wochenbericht*, No. 10/2008, 2008.
- Fuchs-Schündeln, N., D. Krüger, and M. Sommer, "Inequality Trends for Germany in the Last Two Decades: A Tale of Two Countries," *Review of Economic Dynamics*, 13, 103–32, 2010.

- Gosselin, P., *High Wire: The Precarious Financial Lives of American Families*, Basic Books, New York, 2008.
- Gottschalk, P. and R. Moffitt, "The Growth of Earnings Instability in the U.S. Labor Market," *Brookings Papers on Economic Activity*, 217–54, 1994.
- , "The Rising Instability of U.S. Earnings," *Journal of Economic Perspectives*, 23, 3–24, 2009.
- Grabka, M., "Codebook for the PEQUIV File 1984–2008. CNEF Variables with Extended Income Information for the SOEP," Data Documentation 45, German Institute for Economic Research, Berlin, 2009.
- Gustavsson, M., "A New Picture of Swedish Earnings Inequality: Persistent and Transitory Components, 1960–1990," *Review of Income and Wealth*, 54, 324–49, 2008.
- Hacker, J. and E. Jacobs, "The Rising Instability of American Family Incomes, 1969–2004: Evidence from the Panel Study of Income Dynamics," EPI Briefing Paper, No. 213, Economic Policy Institute, 2008.
- Haider, S., "Earnings Instability and Earnings Inequality of Males in the United States: 1967–1991," *Journal of Labor Economics*, 19, 799–836, 2001.
- Haisken-DeNew, J. and J. Frick, "Desktop Companion to the German Socio-Economic Panel Study (SOEP), Version 8.0—Update to Wave 21," German Institute for Economic Research, Berlin, 2005.
- Hall, P., "Methodology and Theory for the Bootstrap," in R. Engle and D. McFadden (eds), *Handbook of Applied Econometrics 4*, North-Holland, Amsterdam, 1994.
- Jenkins, S., *Changing Fortunes: Income Mobility and Poverty Dynamics in Britain*, Oxford University Press, Oxford, 2011.
- Kenworthy, L. and J. Pontusson, "Rising Inequality and the Politics of Redistribution in Affluent Countries," *Perspectives on Politics*, 3, 449–71, 2005.
- Mills, J. and S. Zandvakili, "Statistical Inference via Bootstrapping for Measures of Inequality," *Journal of Applied Econometrics*, 12, 133–50, 1997.
- Mincer, J., *Schooling, Experience, and Earnings*, Columbia University Press, New York, 1974.
- Moffitt, R. and P. Gottschalk, "Trends in the Transitory Variance of Male Earnings: Methods and Evidence," *Journal of Human Resources*, 47, 204–36, 2012.
- Myck, M., R. Ochmann, and S. Qari, "Dynamics of Earnings and Hourly Wages in Germany," DIW-Discussion Paper No. 929, 2009.
- , "Dynamics of Earnings and Hourly Wages in Germany," *Economic Letters*, 113, 143–6, 2011.
- Nichols, A. and S. Zimmerman, "Measuring Trends in Income Variability," Urban Institute Discussion Paper, 2008.
- OECD, "Earnings Inequality, Low-Paid Employment and Earnings Mobility," *OECD Employment Outlook*, OECD, Paris, 59–108, 1996.
- Peichl, A., N. Pestel, and H. Schneider, "Does Size Matter? The Impact of Changes in Household Structure on Income Distribution in Germany," *Review of Income and Wealth*, 57, 118–41, 2012.
- Rodrik, D., "Why Do More Open Economies Have Larger Governments?" *Journal of Political Economy*, 106, 997–1032, 1998.
- Schewe, K. and M. Slaughter, "Economic Insecurity and the Globalization of Production," *American Journal of Political Science*, 48, 662–74, 2004.
- Shin, D. and G. Solon, "Trends in Men's Earnings Volatility: What Does the Panel Study of Income Dynamics Show?" *Journal of Public Economics*, 95, 973–82, 2011.
- Shore, S., "For Better, For Worse: Intra-Household Risk-Sharing over the Business Cycle," *Review of Economics and Statistics*, 92, 536–48, 2010.
- Sinn, H.-W., "A Theory of the Welfare State," *Scandinavian Journal of Economics*, 97, 495–526, 1995.
- Sologon, D. and C. O'Donoghue, "Cross-National Trends in Permanent Earnings Inequality and Earnings Instability in Europe 1994–2001," CEPS Working Paper No. 2010-34, 2010.
- Topel, R. and M. Ward, "Job Mobility and the Careers of Young Men," *Quarterly Journal of Economics*, 107, 439–79, 1992.
- Van Kerm, P., "An Anatomy of Household Income Volatility in European Countries," CHER Working Paper No. 16, 2003.
- Van Kerm, P., "Extreme Incomes and the Estimation of Poverty and Inequality Indicators from EU-SILC," IRISS Working Paper No. 2007-01, 2007.
- Wagner, G., J. Frick, and J. Schupp, "The German Socio-Economic Panel Study (SOEP)—Scope, Evolution and Enhancements," *Schmollers Jahrbuch*, 127, 139–70, 2007.



## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

**Figure A1:** Transitory and Permanent Variances of Real Gross Earnings including High Income Sample

**Figure A2:** Transitory and Permanent Variances of Real Net Household Income including High Income Sample

**Figure A3:** Transitory and Permanent Variances of Real Gross Earnings including Women

**Figure A4:** Transitory and Permanent Variances of Real Net Household Income including Women

**Figure A5:** Transitory and Permanent Variances of Real Gross Earnings including East Germans

**Figure A6:** Transitory and Permanent Variances of Real Net Household Income including East Germans