

Income Mobility in International Comparison - an Empirical Analysis with Panel Data

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This paper compares the mobility of gross individual labor income, gross equivalent income and net equivalent labor income in the western and eastern states of Germany, in Great Britain, in the USA and in Hungary using panel data of these countries from the period 1989-1995. For every income concept, mobility in East Germany is initially much higher than in West Germany, but converges to the West German level over time. Mobility of gross equivalent income is higher and mobility of net equivalent labor income is lower in West Germany than in Great Britain. Mobility of gross individual and of gross equivalent income is higher and mobility of net equivalent labor income is lower in West Germany than in the US. Mobility of net equivalent income is much higher in Hungary than in East Germany. The results show a unexpectedly high labor market flexibility in Germany compared to Great Britain and the US. However, escaping unemployment is harder in Germany than in Great Britain and the US where unemployed persons manage to get low paid jobs quickly. Moreover, the largest reduction of gross equivalent income mobility by the tax and transfer system is observed in Germany.

1 Introduction

This paper analyzes income mobility which is defined as changes in relative income positions across time. Income mobility is a necessary but not sufficient condition for changes in the overall income distribution: If we observe changes in this distribution, the corresponding incomes must necessarily have changed. On the other hand, if the overall income distribution remains unchanged we can not conclude that incomes did not change as well because relative income positions could have been changed between individuals without changing the overall distribution of these positions. Indeed, many cross sectional studies show a remarkably constant income distribution in many industrialized countries¹. In these cases investigating

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¹ See Atkinson, Rainwater and Smeeding (1995) and Hauser and Becker (1997).

income mobility means to explore what is going on „under the surface“. But the importance of income mobility does not only stem from its contribution to the theory of income distribution dynamics. The pattern and extent of income mobility also influences our conjectures about the implications of a given extent of income inequality²: A society that displays a large amount of income mobility will have a lower inequality when income is averaged over a longer time period than when only one point in time is considered. Thus inequality is less of a problem when high income mobility is observed³.

But a high level of income mobility also promotes efficiency since the highest incomes are allocated to those that perform best in their jobs and not to those that have always belonged to the „upper class“. For the same reason, it also provides incentives for individuals to work hard: On the one hand, there is always a danger to lose one's relative position. On the other hand, if there are no a priori restrictions to get promoted there is a potentially high reward to give one's best⁴. This incentive structure also makes investments in human capital more rewarding than in an society where key positions are granted by heritage. This leads to another beneficial effect of income mobility: It can be seen as an indicator for the equality of (economic) chances and openness of a society and, therefore, social justice⁵.

Income mobility has disadvantages as well. High income mobility means income insecurity⁶. Out of different income paths with the same average income, a risk averse utility maximizing individual will always select the path that has the smallest variation over time⁷. Additionally, high income mobility will be viewed as a disadvantage if it results from a „hire and fire“ attitude of employers or when it is the consequence of frequent transitions from being unemployed to being employed in low paid „junk jobs“. This judgement also makes clear that the income concept under consideration is decisive for the assessment of the disadvantages of income mobility. While movements between unemployment and employment can still be interpreted as labor market flexibility when gross individual labor income is looked at, it should be uncontroversial that the amount of net equivalent income mobility should be lower than gross individual labor income mobility⁸. This is because the tax and transfer system of modern welfare states explicitly aims at protecting its citizens from a complete loss of income (i.e. high

² See Schiller (1977, p. 926).

³ See z.B. Gustafsson (1994, p.67) or Burkhauser et al. (1997).

⁴ See Müller and Frick (1996).

⁵ See Atkinson (1983) and Jarvis and Jenkins (1996).

⁶ See Jarvis and Jenkins (1996).

⁷ See Müller and Frick (1996).

⁸ Net income is defined as gross income minus direct taxes and social security contributions plus transfer payments of all kind from government and social insurance.

downward mobility) when they face unemployment, illness or old age. Correspondingly, a high amount of net equivalent income mobility would indicate that the welfare state is not very successful in compensating for income loss due to acknowledged social risks⁹.

International comparisons of income mobility are quite rare up to now. Creedy et al. (1981) compare income mobility of british men between 1963 and 1973 with that of swedish men between 1960 and 1975 and conclude that there are only small differences in income mobility between the two countries. Fritzell (1990) compares income mobility in Sweden for the years 1973-1980 and in the USA for the years 1971-1978 and finds as well that mobility processes are very similar. Burkhauser and Poupore (1997), Burkhauser et al. (1997) and Burkhauser et al. (forthcoming) investigate income mobility in Germany and the USA between 1983 and 1988. Their results show a surprisingly similar mobility pattern in the two countries. Dirven (1996) analyzes income mobility in Belgium, Holland, West Germany and the USA between 1985 and 1988. His results depend decisively on the choice of model. While a standard model yields the lowest mobility in the USA, followed by Germany, Holland, and Belgium, a refined model displays the lowest mobility in Holland, followed by Belgium, Germany and finally the US.

The present study compares the mobility of gross individual labor income, gross equivalent income and net equivalent income in Germany between 1990 and 1995, in Great Britain between 1991 and 1993, in the USA from 1989 to 1991 and in Hungary from 1992 to 1994. Because of the enormous differences between the eastern and the western states of Germany, these two parts of the country are analyzed seperately. The paper is organized as follows: Section 2 discusses data and methods. Section 3 presents the empirical results of the international comparisons, and section 4 concludes.

2 Data and Methods

The analysis of income mobility in Germany uses the German Socio-Economic Panel (GSOEP). The GSOEP is a longitudinal data base with microdata that was obtained from annual face to face interviews of representative German households. It started in 1984 in West Germany and was extended to the area of the former German Democratic Republic one month prior to German monetary union in July 1990. After German reunification it was continued

⁹ Bird (1992) argues that the tax and transfer system produces the product „social security“ by reducing individual income risks and that the welfare state’s redistribution reduces the „welfare costs of income risk“ (p. 405) enormously.

separately in the eastern and western states of Germany. Since 1990 the GSOEP is administered by the *Deutsches Institut für Wirtschaftsforschung* (DIW) in Berlin. For further information, see Hanefeld (1987), Wagner (1991) and Wagner, Burkhauser and Behringer (1993).

Income data for the USA are provided by the PSID-GSOEP Equivalent File 1980-1994 (EF). This file is composed of the US-american *Panel Study of Income Dynamics* (PSID) and the GSOEP. The PSID data are obtained from annual telephone or face to face interviews of representative households in the US since 1968. Unfortunately, the EF only contains data for the years 1980 to 1992. The EF data were enriched by the PSID variable on *self-reported activity* because the EF contains no data on unemployment. The EF is run jointly by the *Center for Demography and Economics of Aging* at *Syracuse University* and by the DIW. Additional information about the PSID can be found in Hill (1992) and in CEPS/INSTEAD (1996). Butrica und Jurkat (1997) describe the EF.

Data on Great Britain and Hungary stem from the PACO data set which is administered by the *Centre d'Etudes de Populations, de Pauvreté et de Politiques Socio-Economiques/ International Network for Studies in Technology, Environment, Alternatives, Development* (CEPS/INSTEAD) in Differdange, Luxembourg. PACO stands for *panel comparability* since the PACO data set makes national panel studies internationally comparable by harmonizing and standardizing the national panel data sets. In version 2.0 of this data set, comparable data for Luxembourg (1985-92), Great Britain (1991-1993), Hungary (1992-1994), Lorraine/France (1985-1990), Germany (1984-1994)¹⁰ and the USA (1983-1987) were available. The original data for Great Britain are taken from the *British Household Panel Study* (BHPS) and from the *Hungarian Household Panel Study* (HHPS) for Hungary¹¹.

The BHPS data are collected by annual face to face interviews of representative british households. The PACO version of the BHPS data contains the first three waves of the BHPS. The BHPS is run by the *Economic and Social Research Council* (ESRC) *Research Centre on Micro-social Change* at the *University of Essex*. Further information about the PACO data set and the BHPS can be found in CEPS/INSTEAD (1996) and Taylor (1996).

The HHPS is administered by the *Social Research Informatics Centre* (TARKI) in Budapest, by the *Sociology Department of the Budapest University of Economic Sciences* and by the *Hungarian Central Statistical Office*. Data are also collected in annual face to face

¹⁰ This paper nevertheless uses the original GSOEP data because an additional wave for 1995 is available in their newest release.

¹¹ See CEPS/INSTEAD (1996).

interviews of representative Hungarian households. The PACO data set contains the first three waves of the HHPS. TARKI (1994), Toth (1996), CEPS/INSTEAD (1997) and Andorka und Spéder (1997) provide further information.

This paper considers three different income concepts. Gross individual labor income is defined as the income that an individual earns in the labor market before taxes and social security contributions are deducted, i.e. gross wages, salaries and income from self-employment and entrepreneurship. Thirteenth salaries and other gratifications are counted as well. Gross equivalent income is the sum of all gross individual labor incomes of all household members divided by the sum of their equivalence weights. Net equivalent income is the net household income divided by the sum of the equivalence weights of all household members. Equivalence weights are calculated by using the so-called old OECD equivalence scale that assigns a weight of one to the household head, a weight of 0,7 to every other household member of age 15 and older and a weight of 0,5 to every household member of age 14 or younger¹². Note that every household member is assigned the same equivalent income.

The persons in the sample also influence the pattern and amount of income mobility. Here, the analysis is confined to persons who were at least 18 in 1990 and at most 59 in 1995, whose income exceeded the cut-off point of 100 DM, 40 GBP, 500 HUF or 33,33 USD per month and who were either full or part time employed or unemployed in the first year of the analysis. Table 1¹³ presents the number of cases that results from this choice of sample¹⁴.

Since all data sets are not perfectly representative samples of the total population the data must be weighted. For any cross sectional analysis, we use the appropriate cross sectional weight. When computing mobility matrices in Germany we are able to use the proper longitudinal weights. For the other countries longitudinal weights were not available so that weighting was done by using the cross sectional weight of the final year of the transition considered.

This paper analyzes *relative* income mobility. The relative income position of individual i at time t for income concept ic , $rp_{ic,t}^i$, is arrived at by dividing individual income for this income concept at time t , $y_{ic,t}^i$, by the population mean, $\bar{y}_{ic,t}$. Note that $ic=gi$ for gross individual labor income, $ic=ge$ for gross and $ic=ne$ for net equivalent income. Unemployed

¹² Using the new OECD scale or the scale implied by the German social assistance regulations has no impact on the results of this study.

¹³ All tables and diagrams are placed in the appendix.

individuals have a gross individual labor income equal to zero by definition, i.e. $rp_{gi,t}^i = 0$ in this case. By calculating relative income positions incomes, we automatically deflate all incomes by the rise in the respective mean income. Note that this kind of deflating exceeds the correction called for by price increases. Calculating relative income positions also renders superfluous the transformation of incomes in national currency into a single currency, the choice of the appropriate exchange rates and the purchasing power parity considerations associated therewith.

Using these relative income positions, income brackets are defined as follows:

income bracket 1: individual unemployment, $rp_{ic,t}^i \equiv 0$,

income bracket 2: $rp_{ic,t}^i < 0,50$,

income bracket 3: $0,50 \leq rp_{ic,t}^i < 0,75$,

income bracket 4: $0,75 \leq rp_{ic,t}^i < 1,00$,

income bracket 5: $1,00 \leq rp_{ic,t}^i < 1,25$,

income bracket 6: $1,25 \leq rp_{ic,t}^i < 1,50$,

income bracket 7: $rp_{ic,t}^i \geq 1,50$.

Using these relative income brackets, mobility matrices are constructed. According to a distinction of Boudon (1973) we consider a particular type of mobility matrices, the so-called *transition matrix*. The i, j -th element of this matrix is the share p_{ij} of those persons that have been in income bracket i in the first year that are in income bracket j in the final year. The distribution of incomes across income brackets is characterized by p_i and p_j , $i, j = 1, \dots, n$. p_i is the share of the total number of persons that were in income bracket i in the first year. p_j is the share of the total number of persons that were in income bracket j in the final year. n is the number of income brackets. By definition, we have:

$$(1) \quad \sum_{j=1}^n p_{ij} = 1 \quad \forall i \quad \text{and} \quad \sum_{i=1}^n p_i = \sum_{j=1}^n p_j = 1.$$

¹⁴ The cut-off point is not taken into consideration in this table because the number of excluded persons varies between income concepts. It excludes a maximum of 2,8% of cases in Table 1 from the analysis. In most waves, particularly when net equivalent income is analyzed, it is much less than that.

Table 2 shows a transition matrix with these characteristics¹⁵. The Bartholomew-Index¹⁶ (BI) aggregates the information contained in this matrix by summing up the shares p_{ij} outside the main diagonal, i.e. for those individual that have moved to a different income bracket. The larger this move, the higher the weight assigned to it. Furthermore, every share is weighted by the marginal distribution of income bracket i in the first year, p_i :

$$(2) \quad BI = \sum_{i=1}^n \sum_{j=1}^n p_i p_{ij} |i - j|.$$

If no mobility is observed the Bartholomew index takes a value of zero. The higher the observed mobility, the higher the index that is not bounded from above¹⁷.

3 International Comparison of Income Mobility

This section compares empirical results for income mobility processes internationally. Starting point for each comparison is Germany. Since Germany itself is subdivided into two economies the section starts with a comparison between the western and eastern states of Germany.

3.1 The Western and Eastern States of Germany

Tables 3 and 4 present the values of the Bartholomew index for *gross individual labor income* for the western and eastern states of Germany¹⁸. The average for the one year transitions is 0,5744 in the west and 0,9002 in the east. The index values for the two and five year transitions show large differences as well. The enormous difference for the five year transition 1990/1995 is presented in Diagram 1. Diagram 2 displays the dynamics of the index values. Clearly, the large differences diminish over time.

These results show that the East German labor market was much more in motion than the West German. However, this can hardly be ascribed to higher labor market flexibility in

¹⁵ See Boudon (1973, p. 10).

¹⁶ See Bartholomew (1973, p. 24).

¹⁷ For brevity's sake the present paper confines itself to analyzing Bartholomew index values. All the main results still hold when using the index proposed by Shorrocks (1978) or the Pearson correlation coefficient between relative income positions in the first and final year of the analysis. Results using these measures are available from the author upon request.

¹⁸ In what follows the shorthands „West Germany“ for the western and „East Germany“ for the eastern states of Germany are used occasionally. This should not be confused with the two German states that existed before 1990.

East Germany. Rather, the transformation of the East German economy from a centrally-planned to a market-oriented one is the explanation for this observation.

What picture emerges if we consider *gross equivalent income*? As can be seen from Tables 3 and 4, the average of the Bartholomew index for the one year transitions is 0,6988 in the west and 0,9268 in the East. Diagram 1 compares the values for the transition 1990/1995 with those of other income concepts. Diagram 3 also shows that gross equivalent income mobility is a lot higher in East Germany than in West Germany, but also the convergence of East German values to West German levels over time.

Changing from gross individual labor income to gross equivalent income means to introduce the household context into the analysis. Incomes are pooled within a household, and household members without income are indirectly taken into consideration via the equivalence weights. The number of persons in a household may change, thereby altering gross household income but also the sum of the equivalence weights. Since the pooling of income within the household does not only mean greater income security but also pooling income risk and since changes in the sum of the equivalence weights across time greatly affect equivalent income, it seems likely from a theoretical viewpoint that gross equivalent income mobility exceeds gross individual labor income mobility. One possibility to compare the impact of the household context on income mobility between the west and the east is to consider the difference $\Psi_{ge/gi}^{BI,t/t+s}$ between the Bartholomew index for gross equivalent and gross individual labor income:

$$(3) \quad \Psi_{ge/gi}^{BI,t/t+s} = BI_{ge}^{t/t+s} - BI_{gi}^{t/t+s}.$$

The larger $\Psi_{ge/gi}^{BI,t/t+s}$, the larger the increase in mobility when changing from gross individual labor income to gross equivalent income and, consequently, the larger the role of changes in the household composition. Table 5 reveals that the household composition is more stable in the eastern states than in the western states: for every transition, the index value is higher in the west than in the east. The negative values for $\Psi_{ge/gi}^{BI,t/t+s}$ in East Germany indicate that the mobility of gross equivalent income in some cases is even lower than the mobility of wages and salaries.

Tables 3 and 4 also present the values of the Bartholomew-Index for *net equivalent income*. For the one year transitions, the average index value amounts to 0,5960 in the west and to 0,7365 in the east. Diagram 1 compares the difference in index values for the transition 1990/1995 with those for other income concepts. There is also a remarkable convergence of index values as Diagram 4 shows. If one compares convergence between income concepts by

looking at Diagrams 2, 3 and 4 it becomes apparent that convergence is strongest for the net equivalent incomes. The largest gap persists between gross individual labor income mobility in the western and the eastern states.

When changing from gross to net equivalent income mobility, the impact of the tax and transfer system is taken into consideration, and this impact should lead to a reduction in mobility¹⁹. Thus, comparing the difference of the Bartholomew-Index for gross and for net equivalent income,

$$(4) \quad \Psi_{ge/ne}^{BI,t/t+s} = BI_{ge}^{t/t+s} - BI_{ne}^{t/t+s},$$

internationally enables use to compare this impact in the two economies. The larger $\Psi_{ge/ne}^{BI,t/t+s}$, the larger the mobility-reducing effect of the tax and transfer system. From Table 5, it can be seen that $\Psi_{ge/ne}^{BI,t/t+s}$ is positive in both parts of the country. On average, the difference for the one year transitions is 0,1027 in the western and 0,1844 in the eastern states. This shows not only that the tax and transfer reduces the mobility of gross equivalent income but also that this reduction is much larger in East than in West Germany. This result is confirmed impressively by the values of $\Psi_{ge/ne}^{BI,t/t+s}$ for the two and five year transitions²⁰.

3.2 The Western States of Germany and Great Britain

The values of the Bartholomew index for the western states of Germany and Great Britain can be found in Tables 3 and 6. The values for *gross individual labor income* show that West Germany is characterized by higher mobility for the one year transitions but lower mobility for the two year transition (see also Diagrams 5 and 6). A possible explanation for the different results for longer and short term mobility could be that mobility in Germany is more of a short term type than in Great Britain and that in the longer run more Germans than Britons move back to their initial income positions. In other words: the permanent component of income

¹⁹ Note that this impact can not be investigated by comparing the mobility of gross individual labor income and of net equivalent income directly because this comparison would mix up the impact of the household context and the impact of the tax and transfer system. Thus, analyzing gross equivalent income not only serves to analyze the household effect but also to isolate the effect of the tax and transfer system on income mobility by providing a measure of gross income that is adjusted for household composition in precisely the same way as net equivalent income.

²⁰ Hauser and Fabig (1998) show that the last two results are robust. They still hold when the six income classes are not defined by relative income positions but by income sixtiles. Hauser and Fabig also calculate the „Truncated Bartholomew-Index“ (*TBI*) where only downward mobility is looked at, i.e. only elements below the main diagonal of the mobility matrix are taken into consideration. The *TBI* values confirm the above results.

changes is stronger in Great Britain than in West Germany where transitory movements are more frequent.

However, *gross equivalent income* mobility is unambiguously higher in West Germany than in Great Britain as can be seen in Tables 3 and 6. Diagrams 5 and 7 compare the values for the transition 1991/1993 and the one year transitions, respectively. As before, the impact of the household context is analyzed by comparing the difference $\Psi_{ge/gi}^{BI,t/t+s}$ between the Bartholomew index for gross equivalent income and gross individual labor income internationally. Table 7 shows that these values are a lot higher in West Germany than in Great Britain. Hence, the mobility increasing effect of the household context is larger in West Germany than in Great Britain.

Net equivalent income mobility is lower in West Germany than in East Germany, as can be seen from Tables 3 and 6. An illustration of the index values for the transition 1991/1993 can be found in Diagram 5. Diagram 8 illustrates index values for the one year transitions 1991/1992 and 1992/1993.

Comparing the difference $\Psi_{ge/ne}^{BI,t/t+s}$ between the Bartholomew index for gross and net equivalent income mobility internationally leads to the conclusion that the German tax and transfer system reduces gross equivalent income mobility more strongly than the British tax and transfer system. In Britain, net equivalent income mobility is even higher than gross equivalent income mobility between 1991 and 1992 and between 1992 and 1993, as the negative values of $\Psi_{ge/ne}^{BI,t/t+s}$ in Table 7 show.

A natural explanation for the result of a much lower net equivalent labor income mobility in West Germany than in Great Britain are the differences in the tax and transfer systems between the two countries. The German income tax is much more progressive than the british²¹. Moreover, the british transfer system aims at providing a basic level of income only whereas the German transfer system has much more generous benefits²². Accordingly, income tax payments and social security contributions amounted to 37,2% of the gross wage of an average production worker in Germany while his or her british colleague paid only 25,5%. If married, these payments are reduced to 21,8% in Germany and 15,8% in Great Britain²³. From

²¹ See OECD (1991, pp. 156n.), OECD(1992, pp. 233n.), OECD (1993, pp. 145n.) and OECD (1994, pp. 220n.).

²² See Commission of the European Communities (1994).

²³ See OECD (1994, pp. 70n., 102n. and 232n.).

a macroeconomic perspective Germany's tax and social security payments amounted to 40,0% of GDP in 1992 while in Great Britain the respective figure is only 35,0%²⁴.

3.3 *The Western States of Germany and the USA*

For a comparison of *gross individual labor income* mobility in West Germany and the USA, it is particularly insightful to have a closer look at the mobility matrices presented in Tables 8 and 9 before discussing more aggregate measures of mobility. The American mobility matrix shows a remarkably low main diagonal element (the so-called stability rate) in the income bracket of the unemployed: Only 29,0% of those being unemployed in 1990 were still without work in 1991. In contrast, the German stability rate was 50,5%. These values point to a much higher labor market flexibility in the USA as compared to Germany²⁵.

However, two aspects have to be kept in mind when trying to interpret these results. First, American and German definitions for individual unemployment are not exactly the same in the two data sets. While the German variable indicates individual unemployment only if the individual is registered as unemployed at the Labor Office (*Arbeitsamt*), the American variable is defined much less precisely and is thus more likely to change over time. Second, it should be noted that a large fraction of the formerly unemployed persons in the US only move to income bracket two, i.e. change from being unemployed to being working poor. The transition probability of moving from bracket one to bracket two between 1990 and 1991 is 43,9% in the USA and only 21,7% in Germany. These transition probabilities indicate that in the USA a much larger fraction of the formerly unemployed only get low paid jobs²⁶.

The phenomenon of a much more even spread of the formerly unemployed across income brackets in Germany as compared to the USA might stem from the different unemployment insurance institutions in the two countries: Being a certain percentage of the former net wage or salary, German unemployment benefits prevent unemployed from accepting a job whose pay is below the unemployment benefit. The higher the former salary, the higher paid the job an unemployed person in Germany will seek²⁷. The American unemployment insurance pays benefits much shorter than the German, and a smaller amount of

²⁴ See OECD (1994, p. 384).

²⁵ Stability rates of mobility matrices from other transitions that are not included in this paper for brevity's sake (but are available from the author upon request) show similar differences.

²⁶ Stability rates of mobility matrices from other transitions are similar to those above, too.

²⁷ See Lampert (1992, pp. 244n.).

persons is eligible²⁸. Accordingly, American unemployed tend to have a strong incentive to accept a job offer even if the qualifications required for it and the corresponding salary are much below those required for the former job.

While it is easier to escape unemployment in the USA than in Germany, the state of belonging to the *working poor* is more persistent in the USA. Between 1990 and 1991 the stability rate for income bracket two was 67,8% in America, but only 57,1% in the western states of Germany. Also, the danger of moving from bracket two into bracket one, i.e. becoming unemployed again is larger in the US than in West Germany²⁹.

The Bartholomew index values in Tables 3 and 10 show that the overall mobility of wages and salaries is higher in West Germany than in the US. Diagrams 9 and 10 illustrate this for one and two year transitions, respectively. Since high gross individual labor income mobility can be taken as a proxy for high labor market flexibility³⁰, this result is quite surprising in the light of the wide-spread notion of highly rigid labor market structures in Germany. But although the above analysis has shown that escaping unemployment is more difficult in West Germany than in the USA it should also be kept in mind that the working poor show less mobility in America than in West Germany and that movements from unemployment to well paid jobs are more frequent in Germany than in the USA.

This surprising result has to be qualified further. Note that the Bartholomew index values are decreasing throughout the period 1990 to 1995. For the transitions 1993/1994 and 1994/1995, gross individual labor income mobility is actually lower than in the USA for the transition 1989/1990. Moreover, the two economies were at different points in their respective business cycles at the beginning of this study's observation period. Due to German reunification the West German economy was booming while the US economy was slowing down and faced a recession in 1991³¹. These facts might serve as an explanation for the relatively low mobility values in the US and the relatively high values in West Germany. It can not be ruled out that the decline in income mobility in West Germany was caused by the slowing down of the German economy after the reunification boom. Thus, if one takes

²⁸ See OECD (1991, pp. 252n.) and LIS (1997).

²⁹ The differences between stability rates of mobility matrices from other transitions are similar. Also, the same phenomenon of relatively frequent transitions from unemployment to low paid jobs can be observed in Great Britain. The corresponding mobility matrices are available from the author upon request. The differences between West Germany and Great Britain can be explained by the different unemployment insurance institutions which in Great Britain provide only a basic, income independent level of benefits such that even formerly high paid employees have an incentive to accept relatively low paid jobs (see Commission of the European Communities 1994, p. 243n.).

³⁰ See for example Burkhauser et al (1997, forthcoming).

³¹ See OECD (1997, p. A4).

comparable positions in the business cycle instead of the same year as a point of reference, the result of higher gross individual labor income mobility in West Germany does not hold. Accordingly, Burkhauser et al. (1997, forthcoming), investigating mobility for the period 1983-1988 in which both countries enjoyed steady economic growth, find surprisingly similar amounts of income mobility in West Germany and the USA.

Tables 3 and 10 also show that *gross equivalent income* mobility is much higher in West Germany than in the USA (see also Diagrams 9 and 10). As before, comparing the difference $\Psi_{ge/gi}^{BI,t/t+s}$ between the Bartholomew index for gross equivalent income and gross individual labor income internationally enables us to analyze the impact of the household context on income mobility. Table 11 shows that on average the values for $\Psi_{ge/gi}^{MI,t/t+s}$ are a lot higher in West Germany than in the US. This means that changing from gross individual to gross equivalent income leads to a larger increase in mobility in West Germany. Thus, the household context is less stable in Germany than in the USA.

Net equivalent income mobility is lower in West Germany than in the USA, as Tables 3 and 10 and Diagram 9 show³². The reason for this finding can be found Table 11 where the difference between the Bartholomew index values for gross and for net equivalent incomes, $\Psi_{ge/ne}^{BI,t/t+s}$, is compared internationally: Apparently, the German tax and transfer system reduces gross equivalent income mobility by far more than the American system does³³. In the US, net equivalent income mobility is even higher than gross equivalent income mobility, leading to negative values for $\Psi_{ge/ne}^{BI,t/t+s}$.

The different impact of the tax and transfer system in the two countries is hardly surprising if one takes into consideration the different institutional arrangements in the two economies. Not only is the German income tax much more progressive than the American. The benefits of the various German social security institutions are also much more generous and have a more extensive coverage than the American ones³⁴. Accordingly, an unmarried average production worker's taxes and social security contributions in 1992 amounted to 37,2% in

³² Net income data for the USA are only available for the years 1989 and 1990 in the EF. Therefore, only one transition for American net equivalent income mobility exists.

³³ These results contradict Burkhauser et al. (forthcoming) who find for both the US and West Germany a higher amount of net equivalent income than of gross equivalent income mobility. Moreover, they find a slightly higher net equivalent income mobility in West Germany than in the USA. Their results and the present results can be reconciled if one takes into consideration that Burkhauser et al investigate a different time period (1983-1988), that their income concepts are defined somewhat differently and that they analyze income quintiles and much cruder income brackets than this study.

³⁴ See OECD (1991, pp. 156n., 1993, pp. 145n.) and Lampert (1992) for Germany and OECD (1991, pp. 252n., 1992, pp. 237n., 1993, pp. 329n., 1994, pp. 224n.) and LIS (1997) for the USA.

Germany and to 25,9% in the USA³⁵. A macroeconomic perspective yields the same picture: Taxes and social security contributions as a share of GDP in 1992 amounted to 40,0% in Germany and only to 29,0% in the USA³⁶.

3.4 The Eastern States of Germany and Hungary

Since the PACO-HHPS only contains data on net incomes it is not possible to compare gross income dynamics in this subsection. Moreover, we will now take the eastern states of Germany as a point of reference because the East German economy is closer to the Hungarian economy than the West German, being an economy in transition from plan to market as well. Of course, transformation in the eastern states of Germany was quite different from that in Hungary. While East Germany was strongly supported by West Germany after the fall of the iron curtain, Hungary did not enjoy massive financial transfers from another country that could have helped it to mitigate the hardships associated with transformation. These differences in economic transformation make an interesting case for the comparison of income mobility between the two economies.

Comparison of the Bartholomew index values for net equivalent income in Tables 4 and 12 reveals higher mobility in Hungary than in East Germany (see also Diagram 11). This finding of a higher net equivalent income mobility in Hungary as compared to East Germany can be explained by various factors. First, after the breakdown of the communist regime, Hungary went through a severe recession with GDP falling by 18-20% between 1989 and 1993³⁷. Not before 1994 economic recovery broke its way³⁸. It seems reasonable to assume that a recession of this kind must have increased income mobility. However, East Germany's business cycle may have contributed to high income mobility as well, although for different reasons. Growth rates in the eastern states of Germany were the highest among the economies considered here³⁹, and a boom is as likely as a recession to increase income mobility. Hungary also had to cope with rising unemployment that accompanied recession and, presumably, has contributed to high income mobility⁴⁰. But unemployment soared in East Germany as well -

³⁵ See OECD (1994, pp. 70n., pp. 102n. and 232n.).

³⁶ See OECD (1994, p. 384).

³⁷ See Andorka and Spéder (1997, p. 189).

³⁸ See Erdmann (1997).

³⁹ See Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1996, p. 22) and OECD (1997, p. A4).

⁴⁰ See OECD (1997, p. A24).

despite the high growth rates at the beginning of the transition period⁴¹. Thus, both the business cycle and labor market performance contributed to high mobility in the two countries. But it seems safe to say that the influence of these two sources was stronger in Hungary than in East Germany.

When trying to explain income mobility patterns by the business cycle one has to keep in mind that these explanations refer to gross individual labor income mobility in the first place. Since we compare net equivalent income data in this subsection the above discussion is somewhat inaccurate. However, given the dramatic economic changes in both Hungary and East Germany, it is safe to say that at least some part of the gross individual labor dynamics translate into net equivalent labor dynamics.

The extent of this transmission hinges decisively on the redistributive impact of the tax and transfer system on gross wages and salaries. And it is precisely this impact that appears to differ between the two countries that could contribute to the explanation of the large differences in net equivalent income mobility. Although Gábos (1996) shows a relatively far reaching social security system in Hungary, it is unlikely that this system was able to neutralize the economic turmoil caused by the end of communist regime in Hungary. In addition, the coverage of the Hungarian social security system is not as wide as the German. In 1992, an unmarried average production worker had to pay taxes and social security contributions of 37,2% of his gross wage, whereas in Hungary he had to pay only 26,5%⁴². Thus a stronger dampening of income mobility in East Germany than in Hungary can be expected.

In addition, huge amounts of money were transferred from the western to the eastern states of Germany after German reunification. It was estimated that the yearly net transfers from the west to the east during the first five years of the transformation process were between five and seven percent of West German GDP⁴³. These transfers clearly contributed to dampening the mobility of gross incomes associated with the transformation. Hungary did not enjoy transfers of this kind, and it is therefore reasonable to expect *ceteris paribus* a higher level of income mobility as compared to East Germany for this reason as well.

⁴¹ See Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1996).

⁴² See OECD (1994, pp. 70n., pp. 102n. and pp. 232n.).

⁴³ See Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1995).

4 Conclusion

This study has shown interesting differences in income mobility both between income concepts and between economies. However, the time periods for which comparable income data exist do not fully overlap and the number of available waves is not very large in some of the countries considered here. Future research should therefore try to extend the analysis to time periods that are both longer and overlap better than in the present study and to other countries as well. But more importantly, an analysis that goes beyond a pure description of mobility patterns and tries to find causes for mobility processes is needed.

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5 Appendix

Table 1: Cases after application of the selection criteria for persons (without income bottom coding)

Year	West Germany	East Germany	Great Britain	USA	Hungary
1989	-	-	-	8910	-
1990	4943	2920	-	8426	-
1991	4658	2676	4203	8083	-
1992	4485	2534	3716	-	1926
1993	4303	2398	3540	-	1744
1994	4082	2301	-	-	1610
1995	3909	2211	-	-	-

Data base: GSOEP, PACO-BHPS, PACO-HHPS, PSID-GSOEP Equivalent File, PSID

Source: Own calculations

Table 2: The mobility matrix

Income Bracket in t	Income Bracket in $t+s$						Income Distribution in t
	1	2	...	j	...	n	
1	p_{11}	p_{12}		...		p_{1n}	$p_{1\cdot}$
	p_{21}	p_{22}				p_{2n}	$p_{2\cdot}$
...			...				...
i	...	...		p_{ij}		...	$p_{i\cdot}$
...					...		...

n	p_{n1}	p_{n2}	$\dots$			p_{nn}	$p_{n\bullet}$
Income Distribution in $t+s$	$p_{\bullet 1}$	$p_{\bullet 2}$	$\dots$	$p_{\bullet j}$	$\dots$	$p_{\bullet n}$	1

Table 3: Values for the Bartholomew index in West Germany

Transition	Gross individual labor income	Gross equivalent income (old OECD scale)	Net equivalent income (old OECD scale)
1990/91	0,6291	0,7508	0,6495
1991/92	0,5804	0,6839	0,5503
1992/93	0,5992	0,7159	0,6002
1993/94	0,5445	0,6822	0,6237
1994/95	0,5189	0,6610	0,5564
1991/93	0,7517	0,8728	0,7302
1992/94	0,6894	0,8756	0,7236
1990/95	0,8482	1,1900	1,0232

Data base: GSOEP

Source: Own calculations

Table 4: Values of the Bartholomew index in East Germany

Transition	Gross individual labor income	Gross equivalent income (old OECD scale)	Net equivalent income (old OECD scale)
1990/91	0,9966	1,0627	0,9063
1991/92	1,0669	1,0492	0,7685
1992/93	0,9523	0,9537	0,7136
1993/94	0,7764	0,7945	0,6882
1994/95	0,7092	0,7441	0,6058
1991/93	1,2796	1,1924	0,8945
1992/94	1,0518	1,1338	0,8360
1990/95	1,3995	1,4083	1,0380

Data base: GSOEP

Source: Own calculations

Table 5: $\Psi_{ge/gi}^{BI,t/t+s}$ and $\Psi_{ge/ne}^{BI,t/t+s}$ for East and West Germany

Transition	$\Psi_{ge/gi}^{BI,t/t+s}$		$\Psi_{ge/ne}^{BI,t/t+s}$	
	West Germany	East Germany	West Germany	East Germany
1990/1991	0,1217	0,0661	0,1013	0,1564
1991/1992	0,1035	-0,0177	0,1336	0,2807
1992/1993	0,1167	0,0014	0,1157	0,2401
1993/1994	0,1377	0,0181	0,0585	0,1063
1994/1995	0,1421	0,0349	0,1046	0,1383
1991/1993	0,1211	-0,0872	0,1426	0,2979
1992/1994	0,1862	0,0820	0,1520	0,2978
1990/1995	0,3418	0,0088	0,1668	0,3703

Data base: GSOEP

Source: Own calculations

Table 6: Values of the Bartholomew index for Great Britain

Transition	Gross individual labor income	Gross equivalent income (old OECD scale)	Net equivalent income (old OECD scale)
1991/92	0,5248	0,6140	0,6506
1992/93	0,5529	0,6001	0,6193
1991/93	0,7944	0,8367	0,7710

Data base: PACO-BHPS

Source: Own calculations

Table 7: $\Psi_{ge/gi}^{BI,t/t+s}$ and $\Psi_{ge/ne}^{BI,t/t+s}$ for West Germany and Great Britain

Transition	$\Psi_{ge/gi}^{BI,t/t+s}$		$\Psi_{ge/ne}^{BI,t/t+s}$	
	West Germany	Great Britain	West Germany	Great Britain
1991/1992	0,1035	0,0892	0,1336	-0,0366
1992/1993	0,1167	0,0472	0,1157	-0,0192
1991/1993	0,1211	0,0423	0,1426	0,0657

Data base: GSOEP, PACO-BHPS

Source: Own calculations

Table 8: Gross individual labor income mobility in West Germany between 1990 and 1991

Income Bracket 1990	Income Bracket 1991							Income Distribution 1990
	1	2	3	4	5	6	7	
1	<u>50,5</u>	21,7	11,2	5,8	4,1	4,2	2,5	4,2
2	6,0	<u>57,1</u>	18,2	5,6	6,5	3,8	2,8	11,7
3	4,0	9,7	<u>53,6</u>	24,6	4,4	0,7	3,1	13,2
4	2,8	6,8	5,9	<u>56,9</u>	23,4	3,0	1,2	22,9
5	2,4	5,8	1,5	9,0	<u>58,0</u>	20,8	2,4	19,0
6	1,6	2,8	0,6	4,0	14,9	<u>49,7</u>	26,4	11,8
7	0,9	2,8	0,0	0,0	2,0	6,3	<u>87,9</u>	17,2
Income Distribution 1991	4,8	12,4	11,4	19,4	20,0	12,3	19,7	100,0

Data base: GSOEP

Source: Own calculations

Table 9: Gross individual labor income mobility in the USA between 1990 and 1991

Income Bracket 1990	Income Bracket 1991							Income Distribution 1990
	1	2	3	4	5	6	7	
1	<u>29,0</u>	43,9	14,0	7,4	3,4	2,2	0,1	3,7
2	8,3	<u>67,8</u>	16,8	3,7	2,0	0,9	0,7	23,3
3	4,9	18,5	<u>53,7</u>	16,8	4,6	0,5	1,0	16,4
4	1,7	5,3	16,3	<u>52,4</u>	19,8	2,9	1,6	13,1
5	1,7	3,4	3,5	20,0	<u>49,7</u>	14,9	6,7	13,0
6	0,9	1,1	1,5	4,9	22,1	<u>48,6</u>	20,9	8,9
7	1,0	1,8	0,7	2,2	3,1	7,9	<u>83,3</u>	21,6
Income Distribution 1991	4,5	22,1	16,1	14,3	13,0	8,7	21,3	100,0

Data base: PSID-GSOEP Equivalent File 1980-1994, PSID

Source: Own calculations

Table 10: Values of the Bartholomew index for the USA

Transition	Gross individual labor income	Gross equivalent income (old OECD scale)	Net equivalent income (old OECD scale)
1989/90	0,5568	0,6579	0,6755
1990/91	0,5663	0,6415	-
1989/91	0,6947	0,8033	-

Data base: PSID-GSOEP Equivalent File 1980-1994, PSID

Source: Own calculations

Table 11: $\Psi_{ge/gi}^{BI,t/t+s}$ and $\Psi_{ge/ne}^{BI,t/t+s}$ in West Germany and the USA

Transition	$\Psi_{ge/gi}^{BI,t/t+s}$		$\Psi_{ge/ne}^{BI,t/t+s}$	
	West Germany	USA	West Germany	USA
1989/1990	-	0,1011	-	-0,0176
1989/1991	-	0,1086	-	-
1990/1991	0,1217	0,0752	0,1013	-
1991/1992	0,1035	-	0,1336	-
1992/1993	0,1167	-	-	-
1991/1993	0,1211	-	-	-

Data base: GSOEP, PSID-GSOEP Equivalent File 1980-1994, PSID

Source: Own calculations

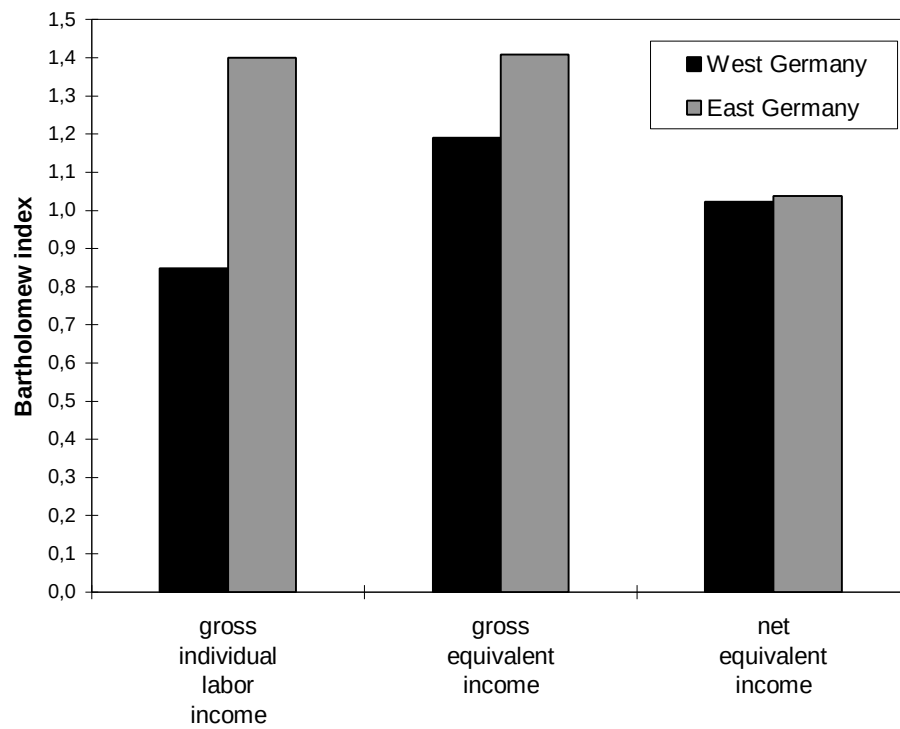
Table 12: Values of the Bartholomew index for net equivalent incomes in Hungary (old OECD scale)

Transition	Index Value
1992/93	0,8785
1993/94	0,8393
1992/94	1,0346

Data base: PACO-HHPS

Source: Own calculations

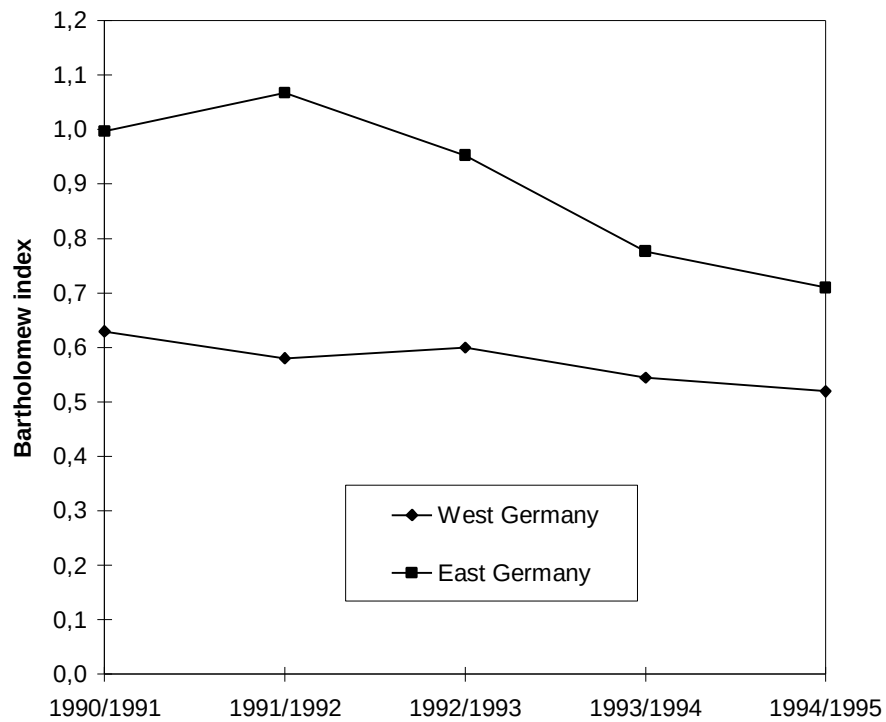
Diagram 1: Mobility of gross individual labor income, gross equivalent income and net equivalent income in West and East Germany measured by the Bartholomew index for the transition 1990-95



Data base: GSOEP

Source: Own calculations

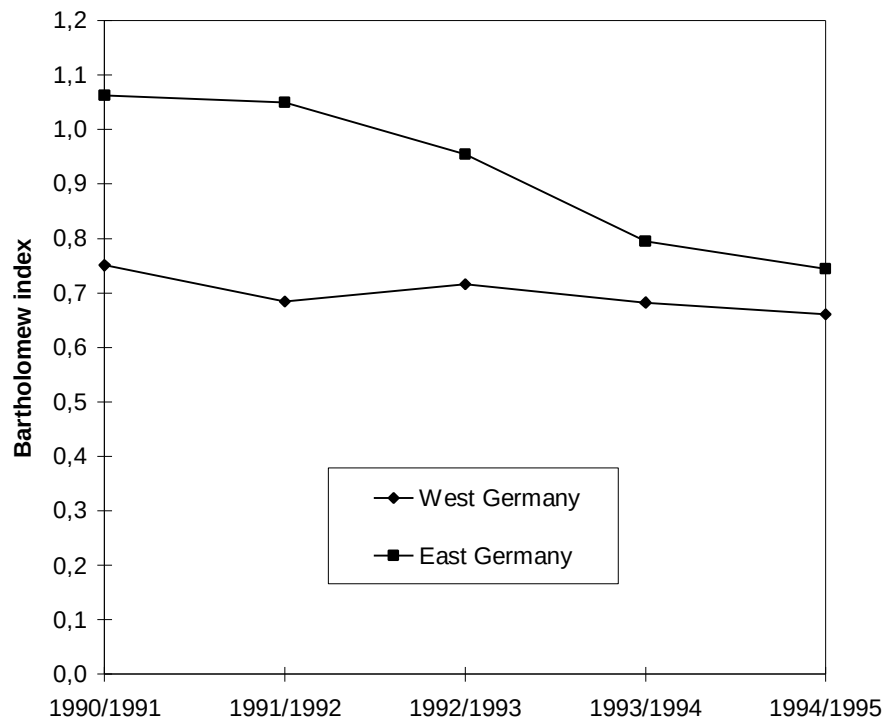
Diagram 2: Mobility of gross individual labor income in West and East Germany measured by the Bartholomew index for various one year transitions



Data base: GSOEP

Source: Own calculations

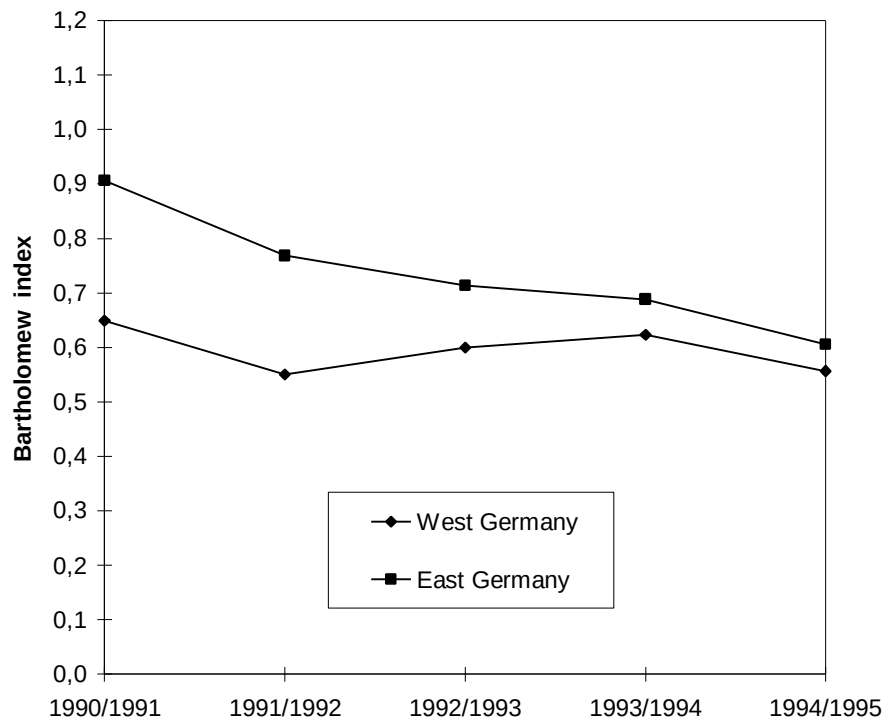
Diagram 3: Mobility of gross equivalent income in West and East Germany measured by the Bartholomew index for various one year transitions



Data base: GSOEP

Source: Own calculations

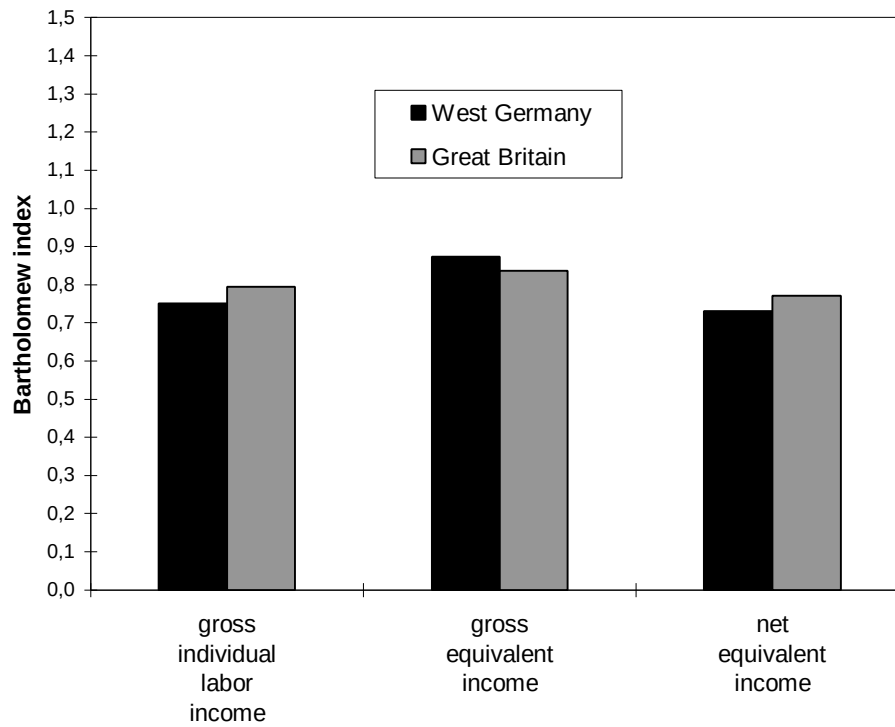
Diagram 4: Mobility of net equivalent income in West and East Germany measured by the Bartholomew index for various one year transitions



Data base: GSOEP

Source: Own calculations

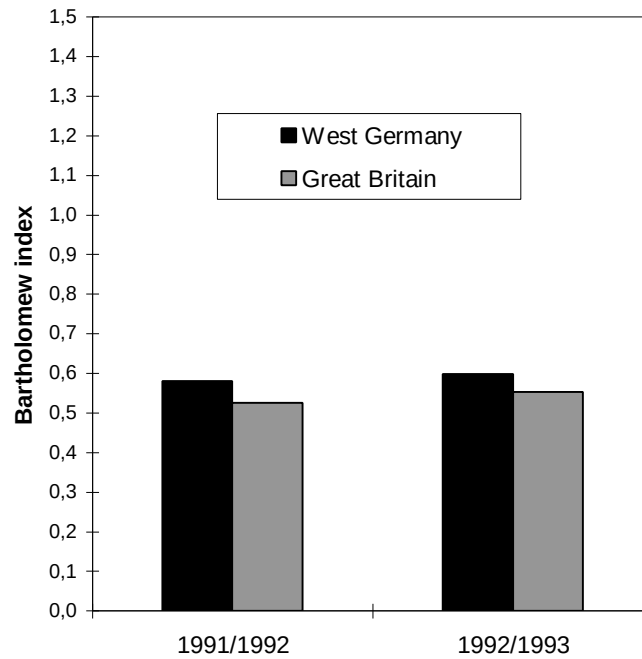
Diagram 5: Mobility of gross individual labor income, gross equivalent income and net equivalent income in West Germany and Great Britain measured by the Bartholomew index for the transition 1991-1993



Data base: GSOEP, PACO-BHPS

Source: Own calculations

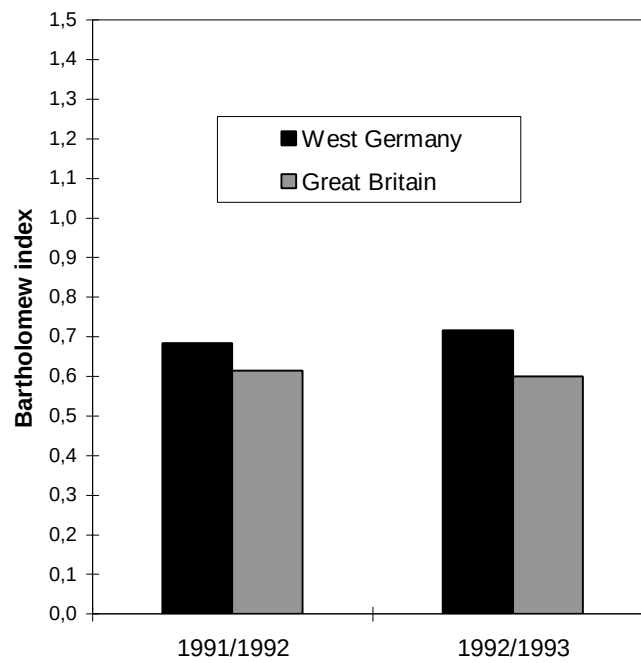
Diagram 6: Mobility of gross individual labor income in West Germany and Great Britain measured by the Bartholomew index for the transitions 1991-1992 and 1992-1993



Data base: GSOEP, PACO-BHPS

Source: Own calculations

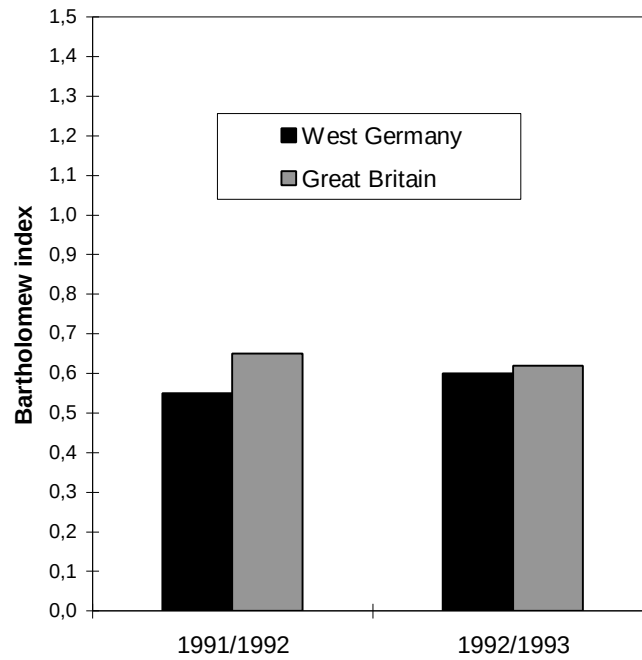
Diagram 7: Mobility of gross equivalent income in West Germany and Great Britain measured by the Bartholomew index for the transitions 1991-1992 and 1992-1993



Data base: GSOEP, PACO-BHPS

Source: Own calculations

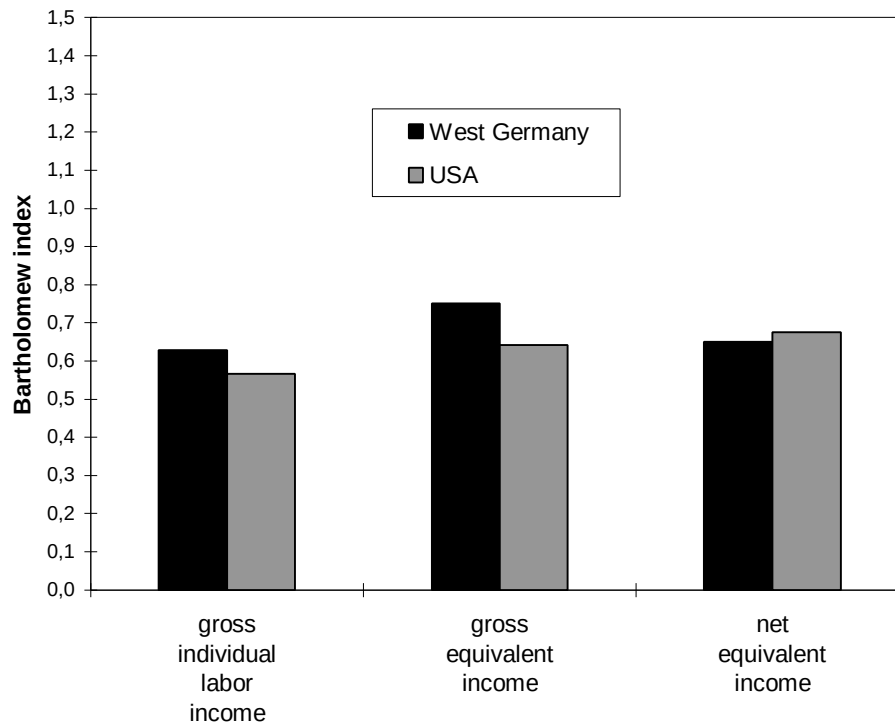
Diagram 8: Mobility of net equivalent income in West Germany and Great Britain measured by the Bartholomew index for the transitions 1991-1992 and 1992-1993



Data base: GSOEP, PACO-BHPS

Source: Own calculations

Diagram 9: Mobility of gross individual labor income, gross equivalent income and net equivalent income in West Germany and the USA measured by the Bartholomew index for one year transitions

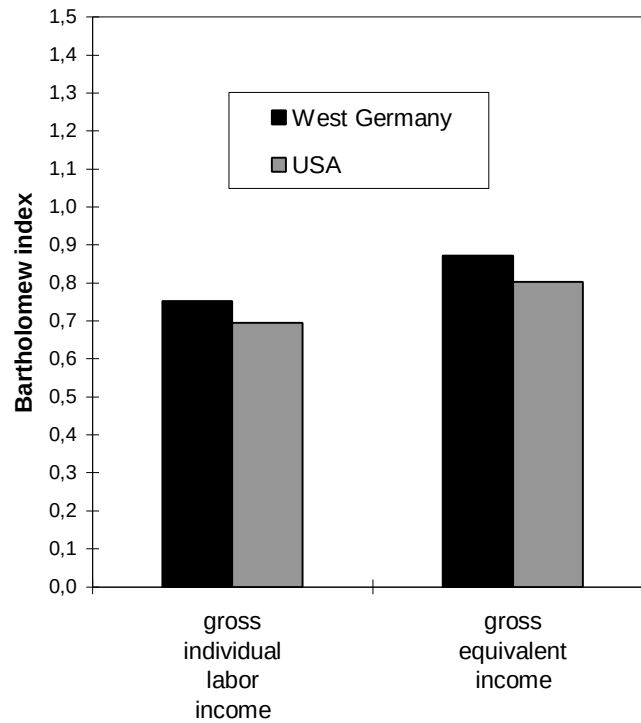


Comments: Gross individual labor income and gross equivalent income mobility refer to the transition 1990-1991. Net equivalent income mobility in Germany refers to the transition 1990-1991 as well, but to the transition 1989-1990 in the USA.

Data base: GSOEP, PSID-GSOEP Equivalent File 1980-1994, PSID

Source: Own calculations

Diagram 10: Mobility of gross individual labor income and gross equivalent income in West Germany and the USA measured by the Bartholomew index for two year transitions

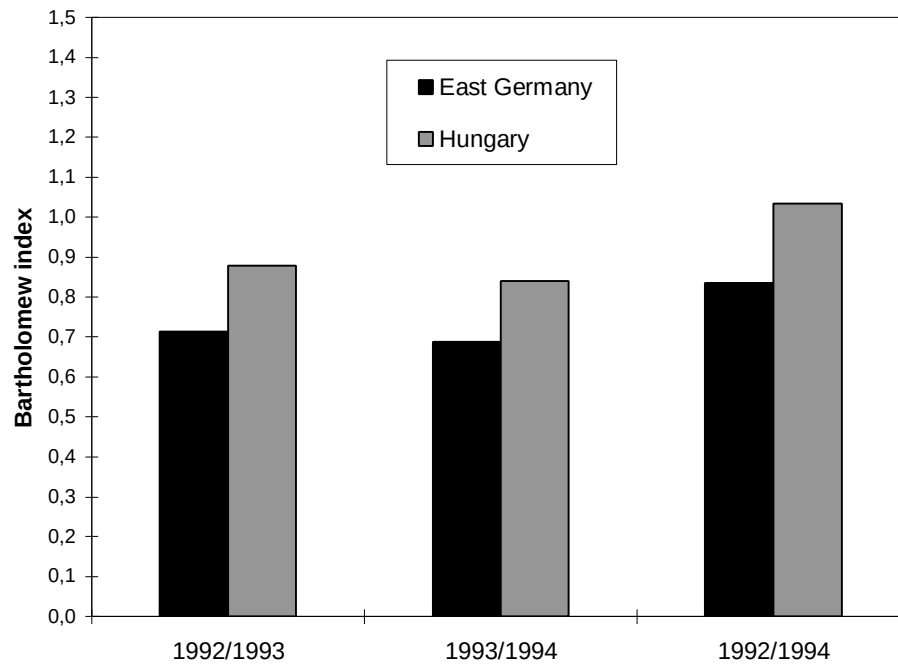


Comments: The two year transitions refer to 1989-1991 in the USA and to 1991-1993 in Germany.

Data base: GSOEP, PSID-GSOEP Equivalent File 1980-1994, PSID

Source: Own calculations

Diagram 11: Mobility of net equivalent income in East Germany and Hungary measured by the Bartholomew index for the transitions 1992-1993, 1993-1994 and 1992-1994



Data base: GSOEP, PACO-HHPS

Source: Own calculations