

Working Paper 7/2010

**Economics and
Demography**

Uwe Fachinger und Ralf K. Himmelreicher

Income mobility

**Some remarks on security and incentive aspects of income
mobility, illustrated by an empirical analysis for Germany**

IMPRESSUM

Working Paper Nr. 7
Zentrum Altern und Gesellschaft, Vechta
Centre for Research on Ageing and Society, Vechta
Juli 2010

Die »Beiträge des Zentrums Altern und Gesellschaft« werden herausgegeben von
Prof. Dr. Gertrud M. Backes

Kontakt:
Universität Vechta
Zentrum Altern und Gesellschaft
Driverstr. 22
D-49377 Vechta
Tel.: +49(0)4441/15-233
Fax: +49(0)4441/15-614

Email: info@zag.uni-vechta.de
Web: <http://www.zag.uni-vechta.de>

ISSN 1869-0009

© bei Autorin/Autor 2010 – Alle Rechte vorbehalten.

Univ.-Prof. Dr. Uwe Fachinger, Head of the Department Economics and Demography, Institute
for Gerontology and Centre for Research on Ageing and Society, University of Vechta
PD Dr. Ralf K. Himmelreicher, Forschungsdatenzentrum der Rentenversicherung (FDZ-RV),
Deutsche Rentenversicherung Bund

ABSTRACT

The description and explanation of the income of people or households has a long tradition in economics as income and its distribution are seen as a main aspect of the wealth of nations. In this context a lot of research has been done to answer questions such as how the distribution is forming out or what the underlying process is which creates the distribution, i. e. income mobility.

The relevance of income mobility is manifold. As people are normally risk averse, they are interested in a steady income stream. This can be called the *security aspect*: The lower the mobility, the higher the wealth of people. Another facet of income mobility is the *incentive aspect*. Upward mobility provides incentives for economic activities as it is possible to be successful and move up the income ladder. Downward mobility on the other hand delivers the “sticks” for economic activities.

In most empirical analyses, the time period covered by the data is relatively short and special aspects of the life cycle theory can not be analysed. As we can use data of workers covering their whole working life, we are able to shed some light on the income mobility over their entire employment careers. This will result in more information about the adequacy of some assumptions of the life cycle theory concerning the development of income over time – especially about the invers-U-shape assumption of income profiles.

Contents

1	Introduction.....	3
2	Some theoretical remarks	5
3	State of the Art	11
4	Method and Data	15
4.1	Method	16
4.2	Data.....	17
5	Empirical Analysis	18
5.1	Income profiles	18
5.2	Mobility.....	21
5.2.1	Overall mobility.....	21
5.2.2	Upward mobility.....	24
5.2.3	Downward mobility.....	27
6	Summary.....	30
7	Literature	31

1 Introduction

The description and explanation of the income of people, households, and families has a long tradition in economics as income and its distribution are seen as a main aspect of the wealth of nations. In this context the distribution and its changes over time are of great interest from a theoretical as well as from an empirical point of view and a lot of research has been done to answer questions such as how the distribution is forming out or what the underlying process is which creates the distribution. Younger people are joining the distribution, older people are leaving – therefore the inequality may change but the underlying process about the development of individual income is unclear. If one can answer those questions, one can also give solutions for economic policy measures concerning the income distribution and therefore the wealth of nations.

In this context the relevance of income mobility is manifold¹. One assumption in economic theory is that people normally are risk averse. Therefore they are interested in a steady income stream. This can be called the *security aspect* of income mobility: The higher the mobility, the lower ceteris paribus the wealth of people². The expectation of future income is relevant for planning of expenditures and savings: The less stable an income stream is, the more people are concerned with the arrangement of spending and saving money³. A lot of goods and services have to be paid permanently such as rent, contributions for insurances⁴ or redemption of credits. An unsteady income stream bears the risk of not being able to fulfil the expectations and therefore may hinder e.g. long term financial commitments⁵.

Another facet of income mobility from an economic point of view is the *incentive aspect*. Upward income mobility provides incentives for economic activities as it is possible to be successful and move up the income ladder as a reward, enjoying a higher social standing. Downward mobility delivers the “sticks” for economic activities as if one is not successful, he will move down in the income distribution – in the worst case getting stigmatized as a failure. Additionally, income mobility is seen as an aspect which can offset the inequality of an income distribution⁶. It is seen as a general possibility of moving up the ladder of

¹ Gottschalk/Danziger (1997), p. 4 f., gives a comprehensible example of the relevance of analysing income mobility; see also Hills (1999), Yaqub (2000), Benabou/Ok (2001a), Brodaty (2007), Lünnemann/Wintr (2009).

² See for example Sinn (1980), Kaufmann (1970), Aaberge/Mogstad (2008).

³ This will result in opportunity costs which are positive correlated with the extent of income mobility.

⁴ Life insurance, health insurance, car insurance, third party insurance to name a view.

⁵ For an example of an analysis linking income distribution and risk perception see Amiel/Cowell (2001). The aspect of risk with respect to income mobility is also mentioned in Burgess et al. (2000). The relationship between saving and income variability is considered e. g. in Bristol (1958).

⁶ On the interdependencies between income inequality and income mobility see e. g. Clark (2003), De Fontenay et al. (2002), Millimet et al. (2003), Bosworth et al. (2001), Organisation for Economic Co-

wealth - often called the American Dream or the Horatio Alger Myth⁷. In other words income mobility is considered to be an equalizer of opportunities. Mobility characterise an open society, where everyone has a chance to climb the ladder of success, which is to some extent documented in the income position⁸.

Last but not least, in a more technical view, income mobility can be regarded as just another form of redistribution – albeit a stochastic one⁹.

Regarding the empirical analysis, in most analyses, the time period covered by the data is relatively short. Therefore special aspects of the life cycle theory could not be analysed. As we can use data of workers covering their whole working life, we are able to shed some light on the income mobility over their entire employment careers. This will result in more information about the adequacy of some assumptions of the life cycle theory concerning the development of income over time – especially about the invers-U-shape assumption of income profiles and the underlying mobility pattern¹⁰.

Furthermore, we will fill some gap in the knowledge as in Germany, income mobility is mainly neglected in the area of distributional and social policy analysis¹¹. Virtually nothing is known for example about earnings mobility and its impact on earnings inequality. Has earnings mobility increased along with earnings dispersion? Is the transition to move up the earnings ladder now easier than before? Has earnings mobility offset the increase in earnings inequality? Which worker groups are likely to see their earnings status to improve, and which to worsen?

Operation and Development OECD (1996) or Gardiner/Hills (1999). Kopczuk et al. (2007), p. 1, point out that “... In order to understand fully the evolution of economic disparity and opportunity [...], it is therefore crucial to combine the analysis of earnings inequality with the analysis of long-term mobility. ...”.

⁷ Sarachek (1978), Holtz-Eakin et al. (2000).

⁸ See for example Ayala/Sastre (2008a), Organisation for Economic Co-Operation and Development OECD (1996), Bigard et al. (1998) or Van Kerm (2006) for research on the differences in income mobility with respect to the comparison as one aspect of the welfare of countries.

⁹ See for such an approach Benabou/Ok (1998) and Benabou/Ok (2001b), p. 2.

¹⁰ See for example Polachek/Siebert (1993). „Understanding how age affects productivity and how in turn this translates into the dynamic of wages seems crucial from the point of view of labour market policy focusing on the ‘greying workforce’. There has so far been little literature focusing on this specific topic and yet any good policy directed at increasing the participation of older workers must be based on a thorough understanding of the age-wage profile.”; Myck (2007), p. 19. See also Börsch-Supan et al. (2005), Kliegl/Mayr (1997), Skirbekk (2004) and Zimprich (2004).

¹¹ Only some rather general information is given in e. g. Bundesregierung (2001), pp. 41, Bundesregierung (2005), pp. 48, Bundesregierung (2009), p. 41.

The paper is structured as follows. First a short overview is given of some relevant theoretical aspects, which has to be taken into account when analysing income mobility. What follows is a survey of the analysis done for Germany. The results presented will yield as background information for our analysis. It is shown that most of the analysis is descriptive just giving information about the changes of income over time without trying to construct or test an explanatory model. However, due to the restricted socio-economic information in our data base, we are also unable to test explanatory models, as can be seen in chapter 4 in which the data and the method are briefly explained. Though, as the time span covered by our data is large, we get information about the relevance of age-, period- and cohort-effects for explaining income mobility.

2 Some theoretical remarks

At first, it is to be stated that in all empirical and theoretical analyses income mobility is defined as the change in income from one period to another for the same research unit, e.g. individuals, households, or families – considering sometimes also the intergenerational dimension¹². However, using families or households¹³ as research units is problematic as such a unit is not stable over time¹⁴ even if one uses equivalence scales to take changes in the household composition into consideration. Nevertheless for comparing the income mobility between countries, it is necessary to take the different household compositions into account¹⁵.

Independent of the income definition and the research unit, six theoretical concepts of mobility are discussed and analysed in the literature¹⁶:

1. time dependence, the focus of this concept is the degree to which income in one period is determined by the income in the previous period(s);

¹² See e. g. Solon (1992). For an analysis of intergenerational mobility on mother or father – daughter or son pairs see Österberg (2000),

¹³ Households could be defined e. g. to be one person living alone, or a group of persons who either share living accommodation or one meal a day, and who have the address as their only or main residence Burgess et al. (2000), p. 17. However, in some analysis the terms household and family are used equally; see for example Chen (2009), pp. 77 f., Dickens/McKnight (2008b) or Pendakur (1998).

¹⁴ See inter alia Duncan/Hill (1985). Therefore analysis on the household level indicate more income mobility than on the individual level, see e.g. Burgess et al. (2000). p. 5.

¹⁵ See for a detailed discussion e. g. Abatemarco (2003), Jenkins (1998), Jarvis/Jenkins (1998) or Gottschalk/Danziger (1997), p. 8 f., Schluter (1997), p. 9; another view on this matter is given in Burgess et al. (2000), p. 18, Hills et al. (2006), Aaberge et al. (2002), or Cruces (2005).

¹⁶ Dragoset/Fields (2007), pp. 12. See for an extensive discussion of those concepts inter alia Fields (2004). For surveys of the theory of income mobility measurement see Fields/Ok (1999), Fields (2004), Fields (2007).

2. positional movement, using this concept one is interested in changes in economic positions in the income distribution (using classifications like ranks, deciles, or quintiles);
3. share movement, this concept focuses on the change of the recipient's shares of total income in the population;
4. income instability¹⁷, which analyse the size of changes in income levels but not their sign;
5. directional income movement, which measures how many recipients move up or down the income distribution and by how much; and
6. mobility as an equalizer of longer-term income, which compares the inequality of income at a point in time with the inequality of income over a longer time period.

All those concepts are used in analyses with different definitions of income¹⁸ and different research units. Therefore, even that a lot of research was done on the methods of measurement of income or earnings mobility¹⁹, the problem still exists that, "the income mobility literature is still distressingly far from being unified on how to measure mobility and make mobility comparisons"²⁰.

In the international literature, most economic mobility studies work with transition matrices²¹. Typically, the rows and columns of such matrices are quantiles (such as quintiles or deciles) of the base year and final year income distributions.

A rather unconventional analysis is the case study of Hills et al. (2006) with 93 families as they are analysing income variations within a year (weekly income records) for family income. Income diaries were used to collect the data and to support the primary data collection method which was a fortnightly Computer-Assisted Telephone Interview.

Most of the discussion is not about the mobility and its explanatory variables / determinants²² but on the adequate method of measurement²³. In the literature new axiomatic contents and analytical properties equal to those existing in the case of the static analysis of the income distribution has been discussed, which are the foundation of new methods and techniques for the measurement of income mobility that has been developed. For

¹⁷ Sometimes called flux Dragoset/Fields (2007), pp. 12.

¹⁸ Covering the whole spectrum from household income to earnings from a specific kind of work.

¹⁹ See for an overview Ayala/Sastre (2008a).

²⁰ Fields/Ok (1999), p. 586.

²¹ Atkinson et al. (1992); Buchinsky/Hunt (1999), Fields (2001).

²² See for an example of analysis using explanatory variables for income mobility Bandyopadhyay/Cowell (2006) with respect to different risk factors or Fachinger (1991), Contini et al. (2007) for approaches to identify some determinants. Chen (2009) analyses the impact of government income (pp. 89-92) and of demographic factors (pp. 92 f.)

²³ Fields/Ok (1996), Fields (2008), Schluter/Van de Gaer (2003), Cruces (2005), Aaberge/Mogstad (2008) Sastri Madduri (1976), Silber/Weber (2008), Ruiz-Castillo (2004), Altonji et al. (2009) ..

example, there are some axiomatic lines of research establishing the basic assumptions that mobility indices should satisfy when analysing the movement of incomes over time²⁴. Also the measurement of income mobility from a welfare point of view is intensively examined in the literature. Such approaches generally relate income mobility with the equality of opportunity and the removal of social barriers.

A different approach is the Markovian model of mobility. This model utilizes stochastic processes for modelling the time path of income. The last approach sees income mobility as the transitory component of income development over time – with no “explanatory power”. This would mean that mobility is residual and can not be explained. But this is unsatisfying as the changes in the income position over time need to be explained.

Therefore the questions remain: how to explain mobility respectively what are the determinants of income mobility? A natural starting point would be the life cycle theory. The main goal of this theory is the explanation of the development of individual income over time. But this includes implicitly also the consideration of some of the six concepts, mentioned above, and therefore the explanation of some aspects of income mobility.

However, in life cycle theory income mobility is not explicitly addressed. It is rather seen as a residual factor or the transitory component contrary to the permanent income²⁵.

Permanent income can be viewed as a function of human and non-human capital of individuals (or households conditioned by its composition) which controls for position in the life cycle²⁶. This can be illustrated by a simple formulation such as:

$$Y_t = \alpha_t \cdot D_t + \beta_t \cdot E_t + \gamma_t \cdot A_t + \delta_t \cdot C_t + \varepsilon_t \quad 1$$

Where permanent income Y in time period t is seen to depend on

- household composition D,
- the educational and occupational status E,
- stock of physical assets A – it is assumed, that A will peak after around 2/3 of working life; using a quadratic term to deal with this assumption leads to an invers-U-shape profile²⁷ –, and

²⁴ Fields/Ok (1996), Mitra/Ok (1998), Cowell/Schluter (1998).

²⁵ See for an analysis with panel data on transitory and permanent components e. g. Ramos (2003).

²⁶ Deaton (1992).

- community or environmental characteristics C such as access to amenities.

Therefore ε is the catch-all variable for all other aspects not included in the explanatory variables D, E, A, and C. Changes in income are due to external shocks like illness, unemployment, retirement, economic shocks influencing the income out of savings (like the ongoing financial crisis), changes in the service of communities etc. For individuals those shocks are not predictable and the individuals are helpless in face of such factors like a small boat on a stormy sea.

Entering the labour force a lot of the above mentioned variables are deterministic, like age, gender, or education. The question is what are the relevant determinants to explain income changes? It should be clear, that the income from at least the previous period must be taken into account as, given equation 1, income mobility can be seen as the differences in income between to points in time.

$$\Delta Y = Y_{it} - Y_{it-1} + \varepsilon \quad 2$$

Let X be a vector which includes the “explanatory” variables (e. g. X includes dummies for gender, race, age, and education) and using lagged income variable Y_{it-1} result in

$$\Delta Y = \rho \cdot X + \delta \cdot Y_{it-1} + \varepsilon \quad 3$$

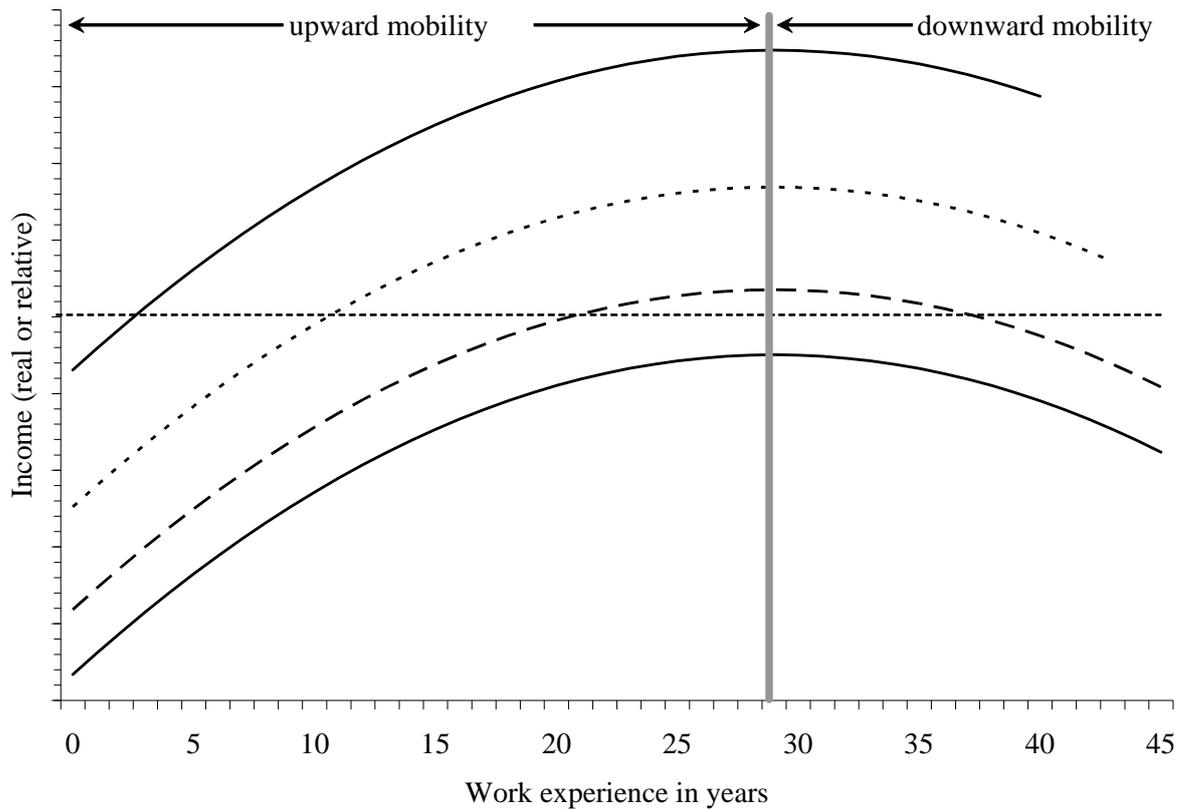
Taken into account the kind of determinants in the four groups, this is acknowledge e. g. by Dragoset/Fields (2007), who “... do not interpret this as a causal model of earnings changes, but rather a way of answering the question of which individuals experience the most positive earnings changes, holding other things equal. ...”²⁸.

Using such equation for the description of the income development over time, results in an invers-U-shaped profile for the (working) life cycle of individuals as shown in Figure 1.

²⁷ See for a discussion Fachinger (1994).

²⁸ Dragoset/Fields (2007), p. 15. However, e. g. Smith (1994) identifies some factors which “explain” income mobility.

Figure 1: Income profiles and income mobility



Source: Own diagram.

The profiles in Figure 1 indicate a special pattern of mobility but the figure is open to at least two interpretations. Firstly, the profile can be seen as the development of real individual income over time, representing the productivity of the worker²⁹. Since the marginal productivity decreases over the whole career and employees are paid due to their productivity, the income profile follows this pattern. Therefore, from its own point of view the individual experience a rise in real income – upward mobility – and after about 2/3 of working life a decline in real income – downward mobility. Explaining this process would therefore be identical to explaining income mobility.

Secondly, the development of real income may also lead to changes in the income position. Entering the labour market the individual may start to climb up the income ladder over the time as she or he is physically well equipped and has the newest knowledge about technology etc. The amount of human capital will therefore lead to a higher productivity than the older employees, resulting in a steeper profile and to a higher productivity. The profile has a decreasing marginal rate of return as the human capital / earnings

²⁹ See for example Skirbekk (2008).

capability will diminish. The wear and tear lead to a drop down in physical skills as well as the intellectual assets will get older.

This means that we notice an upward mobility in the income distribution during the first part of working life and a downward mobility afterwards. In other words, by analysing mobility, someone has to look at the entire picture as short-term analyses can not identify the long-term development – even if in some years downward mobility dominates, it is necessary to take the development over a longer period of time into consideration.

This concept of income mobility is a little bit trickier to explain as it has to take the income distribution into account. It is not covered by the income function as one can experience upward mobility due to a rise in real income and at the same time, her or his relative position within the distribution may decrease.

The first kind of income mobility measuring concept is called non-positional income mobility because the changes of the absolute real or nominal income over time are considered³⁰. If the relative position and its changes in the distribution are considered, this kind of mobility is called positional mobility.

With that in mind, the invers-U-shape of an income profile in cross sectional analysis can be interpreted as a description of the development of an individual position in the income distribution over time. However, there exist strong indications that it is not an individual profile³¹.

At least one more problem arises in measuring and / or explaining income mobility. One has to take into account the composition of income. As a rule, income of people or individuals comprises different components enclosing earned and unearned income. Each component should be analysed separately because the factors, which could be explaining the mobility of income are not the same³². The determinants of wages are different (productivity, labour unions etc.) than the determinants of income from capital (economic success of investment company etc.). However, the direct and indirect effect of an income source on income mobility depends on its own mobility.

³⁰ It is explained in more detail in Fields/Ok (1996); Beenstock (2004) distinguish those two aspects in quantity and rank mobility.

³¹ But often it is viewed as such, ... especially by using cross sectional data from one point in time for the analysis of time-dependent processes such as income development (e. g. Schäfer (1981), Millimet et al. (2003), Klevmarken (2004), Bager-Sjögren/Klevmarken (1998), p. 487)... as is mentioned also in Burgess et al. (2000), p. 11. This is discussed in detail inter alia in Fachinger (1994), Fachinger/Himmelreicher (2007).

³² See for example Burgess et al. (2000), p. 7 f.

Therefore, we take a closer look at the development of a special kind of wages out of one resource – earning which is subject to social insurance contributions. Such data has also some advantages compared with survey data. On a more technical note, especially in analysing mobility on the basis of survey data you have to deal with measurement errors³³ – are the deviations for real or the result of the data collection process? In an attempt to work with an error-free measure of earnings³⁴ a much smaller literature uses only administrative-based data to study mobility. Using such data is also advantageous as no problem with sample attrition exist³⁵.

3 State of the Art

Nowadays we know a lot more about the distribution of income and earnings – but we don't know the underlying processes which generate such distribution and until now, only little research has been done to try to explain it. Research was almost done on describing income mobility – i. e. markov process or transition matrices are measures to describe the process, not to explain it. Analysis was mostly undertaken empirically to identify the underlying process which shape the income distribution. Furthermore, despite the extensive empirical literature about income mobility in general, little is known about the long term mobility as “... studies of mobility have focused primarily on short term mobility measures due to lack of long and large longitudinal data. ...”³⁶. Therefore we know a lot about the process itself – how income mobility has develop over time for particular countries esp. the U. S.– but we know a lot less about the reasons, why this has happened³⁷.

Contrary to the overall situation, only little research has been done on income mobility in Germany – and those empirical works differ especially in method and covered time period as can be seen in Table 1. For Germany, just two data bases were used to analyse income mobility: The German Socio-economic Panel (GSOEP)³⁸ and social security earnings

³³ See e. g. Gottschalk/Huynh (2006), Klevmarken (1993); an overview is given by Dragoset/Fields (2007), p. 2 ff.

³⁴ The DADS (Declarations Annuelles de Données Sociales) data from the French National Statistical Office INSEE, was used for example by Buchinsky et al. (2003) to study income mobility in France, for Germany see Fachinger (1991) and Fachinger (1994), for Austria Hofer/Weber (2001), for Switzerland Meier (1983), for UK Dickens/McKnight (2008a), for the U.S. Kopczuk et al. (2007) and Congressional Budget Office (CBO) (2007).

³⁵ See for problems concerning sample attrition e. g. Ayala et al. (2006).

³⁶ Kopczuk et al. (2007), p. 1.

³⁷ The empirical literature on income and earnings mobility in various countries around the world is voluminous; see Atkinson et al. (1992), Baulch/Hoddinott (2000), and Dragoset/Fields (2007) for surveys. An overview of empirical research in Latin America is given by Fields et al. (2006).

³⁸ For a description of the data see e. g. Wagner et al. (2007).

records from the Statutory Pension Insurance (FDZ-RV)³⁹. Most analyses were done using the GSOEP – albeit with different population and statistical unit, which makes the results hardly comparable in detail – and so far, only three analyses covering a large time period were done by using data records from the FDZ-RV⁴⁰.

Table 1: Data sources and methods used in income mobility analyses in Germany

References	Source	Population and statistical unit	Period	method
Schäfer (1981)	Various surveys	Special groups of workers	1886 to 1906; Cross section from 1900, 1905, 1910	Non positional mobility and hypothetical profiles based on cross section data
Schmähl/Fachinger (1989)	Social security earnings records	Gross individual earnings	1961 to 1970	transition matrices, deciles
Fachinger (1991)	Social security earnings records	Gross individual earnings	1950 to 1979	Hazard rate models, deciles
Rendtel/Schwarze (1991)	GSOEP		1984 to 1989	transition matrices, deciles
Rohwer (1991)	GSOEP		1984 to 1989	transition matrices
Berntsen (1992)	GSOEP			transition matrices
Rendtel et al. (1993)	GSOEP	equivalised ⁴¹ household income	1984 to 1986	transition matrices, two states above and below the poverty threshold
Fachinger (1994)*	Social security earnings records	Gross individual earnings	1950 to 1979	transition matrices, deciles
Schluter (1997)	GSOEP	equivalised ⁴² household income	1984 to 1989	transition matrices with four groups with respect to the median***
Müller/Frick (1997)	GSOEP	equivalised ⁴³ household income	1990 to 1994	transition matrices
Trede (1997) / Trede (1998)	GSOEP	gross labour incomes earned by males	1984 to 1992	Mobility indices and transitions matrices
Merz/Kirsten (1998)	GSOEP	equivalised ⁴⁴ household income	1985 to 1994	

³⁹ See for a general description of the data Fachinger (1994), chapter 2, and Himmelreicher/Stegmann (2008).

⁴⁰ But this situation may change as such data are now provided by the Research Data Centre (FDZ) of the German Pension Insurance (FDZ-RV) (http://forschung.deutsche-rentenversicherung.de/ForschPortalWeb/contentAction.do?key=main_fdz_english) and of the Federal Employment Agency at the Institute for Employment Research (<http://fdz.iab.de/en.aspx>).

⁴¹ The equivalence scale used in this analysis was in accordance with German legislation for social aid: head of household 1.0, member of household older than 18 years 0.8, household members aged between 15 and 18 years 0.9, for household members 0.65 which are aged between 8 and 14 and for those younger than 7 years 0.55.

⁴² “New” OECD equivalent scale: Income divided by household size raised to power 0.5.

⁴³ The equivalence scale used in this analysis was in accordance with German legislation for social aid: head of household 1.0, member of household older than 18 years 0.8, household members aged between 15 and 18 years 0.9, for household members 0.65 which are aged between 8 and 14 and for those younger than 7 years 0.55.

⁴⁴ Different equivalent scales.

Schluter (1998)	GSOEP	equivalised ⁴⁵ post-tax post-benefit household income	1984 to 1993	Shorrocks and Prais mobility indices
Hauser/Fabig (1999)	GSOEP	gross individual labour income, gross and net equivalent ⁴⁶ labour income of households	1990 to 1995	Bartholomew-Index and transition matrices with six classes
Fabig (1999a) / Fabig (1999b)	GSOEP	gross and net equivalent ⁴⁷ household income	1990 to 1995	Bartholomew-Index and transition matrices with seven classes
Habich/Spéder (2000)	GSOEP		1990 to 1994	transition matrices with six classes
Maasoumi/Trede (2001)	GSOEP			generalized entropy mobility measures
Jenkins/Van Kerm (2003)	GSOEP	Person's post-tax post-transfer annual income	1985 to 1999	Gini-Index and decomposition of inequality change
Van Kerm (2003)	GSOEP	Person's post-tax post-transfer annual income	1984 to 1997	Mobility indices
Schluter/Trede (2003)	GSOEP			Mobility indices, transition matrices, quintiles
Behr et al. (2003)	ECHP**	Household income	1997 to 1998	
Zaidi et al. (2004) / Büchel et al. (2004)	GSOEP	net equivalised ⁴⁸ household income	1990 to 2000	Shorrocks index and transition matrices, quintiles
Sopp (2005)	GSOEP		1984 to 2000	
Hauser et al. (2007)	GSOEP	net equivalised ⁴⁹ household income	2000 to 2006	transition matrices
Ayala/Sastre (2008b)	ECHP	Real disposable equivalent ⁵⁰ household income	1993 to 1997	Fields and Ok mobility index, Chakravarty–Dutta–Weymark mobility index
Grabka/Frick (2008)	GSOEP	net equivalised ⁵¹ household income	1996 to 2006	transition matrices
Brenner (2009)	Social security earnings records	Gross individual earnings	1976 to 2004	correlations between annual earnings are estimated with bivariate tobit models

* : Fachinger (1994), chapter 5, p. 211 ff.

** : ECHP European Community Household Panel – the data for Germany are from the GSOEP.

*** : lower 0.5, between 0.5 and 1.0, between 1.0 and 1.5 and the fourth with more than 1.5.

⁴⁵ OECD equivalent scale: Income divided by household size raised to power 0.5.

⁴⁶ „Old“ OECD equivalent scale: head of household 1.0, member of household older than 14 years 0.7 and household members 14 and younger 0.5.

⁴⁷ „Old“ OECD equivalent scale: head of household 1.0, member of household older than 14 years 0.7 and household members 14 and younger 0.5.

⁴⁸ Equivalence scale is approximated by the square root of the household size.

⁴⁹ Equivalence scale is approximated by the square root of the household size.

⁵⁰ „Modified“ OECD equivalent scale: head of household 1.0, member of household older than 14 years 0.5 and household members 14 and younger 0.3.

⁵¹ Equivalence scale is approximated by the square root of the household size.

As can be seen from the list, in principle information about income mobility in Germany is available. Unfortunately the results are not directly comparable as those analyses are using the same data base but not the same methods and not even the same income concept. However, overall one can state that a lot of income mobility was detected. But all those analyses on the basis of the GSOEP cover only a short period of time. Only the analyses done by Fachinger and Brenner (2009) took the whole working biography into account.

The GSOEP was also used in the reports of poverty and riches of the Federal Government of Germany⁵². The reports illustrate the view of the Federal Government on the relevance of income mobility in economic and social policy as mobility is mainly discussed in connection with poverty risk and not as an overall phenomenon to describe the aforementioned aspects of welfare in respect to income mobility⁵³.

Hence from a political point of view it is unknown what has to be done to reduce or to foster income mobility. The political focus lies on attempts to reduce income poverty or social exclusion, in other words to rise upward mobility for the poor⁵⁴ and to reduce downward mobility for those who have a high poverty risk. Therefore, “explaining” mobility concentrates on trying to find determinants which could be used to develop measures reducing or avoiding social exclusion.

Concerning income mobility, for Germany only one analysis was done to identify and analyse its determinants using hazard rate models⁵⁵. However, even our knowledge about the process of mobility itself is limited. Will there be less mobility in later working life when the positioning in the income distribution has finally taken place as the following figure indicates? How much persistence exists? We do not know whether the income position remains the same as it is indicated by the profile of average income after a period which ends with the positioning into the distribution.

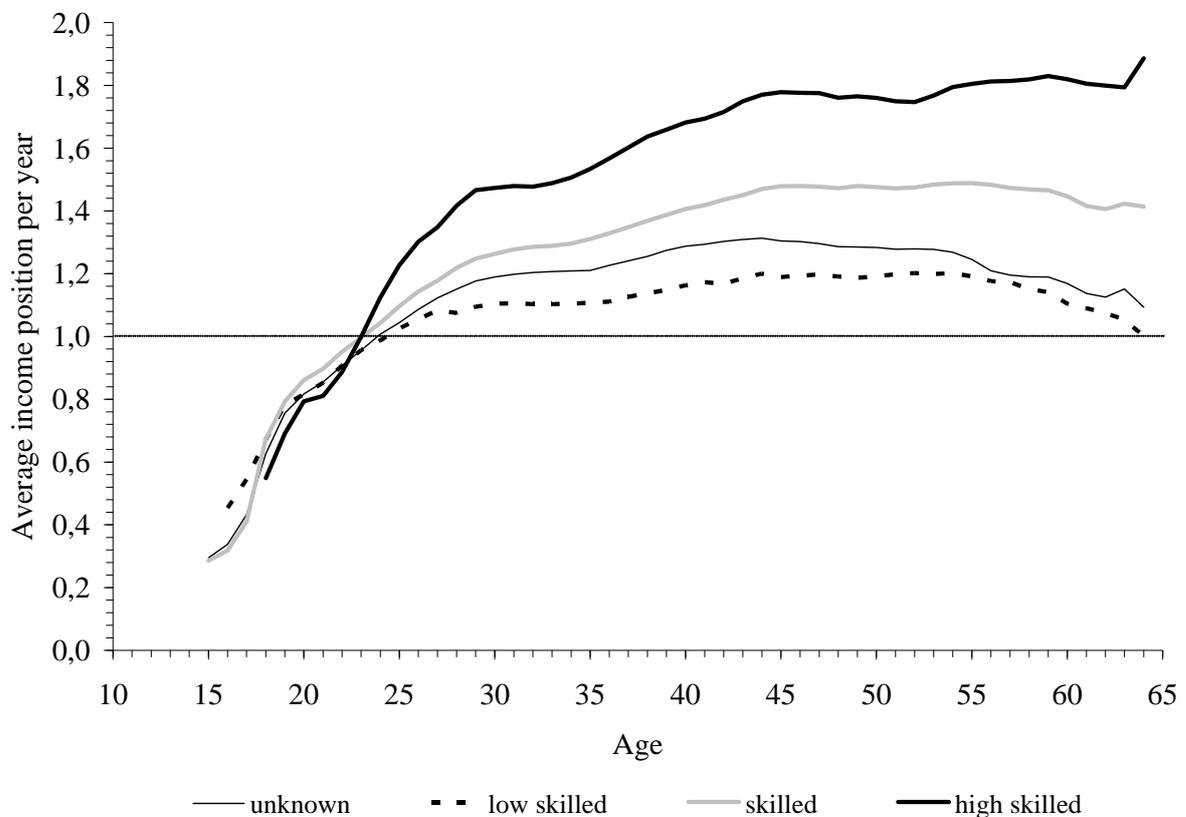
⁵² Bundesregierung (2001), pp. 41, Bundesregierung (2005), pp. 48-49, Bundesregierung (2009), p. 41.

⁵³ See for a more general discussion Gardiner/Hills (1999)

⁵⁴ In this sense, the comparison of low income earners in Germany and Great Britain leads to a positive result for the labour market in Britain as the upward mobility and therefore the chance to move up the income ladder is higher in Britain; see e.g. Klodt (1998).

⁵⁵ Fachinger (1991).

Figure 2: Age-earnings profiles of West-German men of the birth-cohorts 1939-1944 who retired in 2004, according to level of education



Source: FDZ-RV – SUF VVL2004, own calculation; see Himmelreicher/Stegmann (2008).

Arguing along the line of concept 2 or the so called positional mobility and looking at the profiles in Figure 2 it could be assumed, that – after entering the labour market – over a time span of about ten years upward income mobility will determine the income changes. Following this remarkable increase of the income position, contrary to the profiles in Figure 1, only minor mobility within the distribution will take place. Only the profiles for low skilled employees and for those with unknown education level indicate some downward mobility at the end of the working career starting at the age around 55.

4 Method and Data

As previously discussed, at least three aspects has to be taken into account in analysing income mobility,

1. the definition of income,
2. the definition of the research unit, and
3. the setting of the concept of mobility analysis.

The income used for the analysis is set by the used data material⁵⁶: gross monthly labour earnings which are due for social security contributions. This also constitutes the research unit: the individual who is registered in the state pension insurance records.

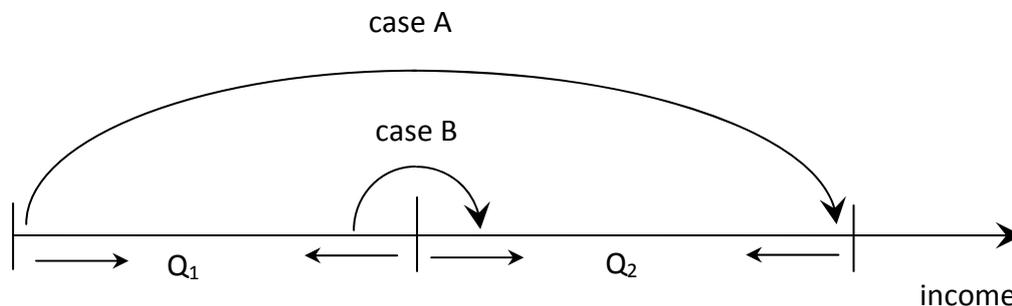
In the analysis, we will consider the income of the same individuals at two or more points of time.

4.1 Method

As discussed earlier there are several alternatives to define mobility and the approaches used in previous analyses for Germany are quite different, as is shown in Table 1. We will use the concept of positional mobility and apply transition matrices – the change from one relative income class to another – with twenty classes.

This approach bears some problems which have to be taken into account when interpreting the results. For example a change in income from the lower class limit to the upper class limit of the next one (case A) is exactly judged the same as a change from the upper limit of the class Q_1 to the lower limit of next higher class Q_2 as shown in Figure 3.

Figure 3: Diagram of „jumping distance“



Source: Own diagram.

Another problem comes from the instability of the class limits. If class limits change over time and the income remain the same, a change of classes could happen – and therefore it would be interpreted as positional mobility even that an individual does not experience a change in income at all. Because transition matrices are based on ranks in the income distribution, they can only present a picture of changes of position within the income distribution and cannot give evidence about the effects of changes in dollars or other currency units, either within or across classes. This clarifies the differences between positional and non-positional income mobility⁵⁷.

⁵⁶ See for a detailed description Himmelreicher/Stegmann (2008).

⁵⁷ Positional and non-positional income mobility is analysed e. g. by Contini et al. (2007), p.17 ff.

4.2 Data

Longitudinal micro-data of the German Federal Pension Insurance are used which contains biographical and pension information on people which retired in the same year⁵⁸. Therefore such data are inflow samples which include only retirees. The sample covered a time span from the first year of contribution payment to the German Federal Pension Insurance until the retirement year. Hence the maximum time span covers 52 years, starting in the year the person turned 17 up to the year the person turned 65.

Two different samples are used for our analysis. The first inflow-sample is from the year 1981 (ASK-VVL1981) and the second from year 2005. In all, the data cover the time span from 1947 up to 2005 (FDZ-RV-SUFVVL2005). Therefore, period effects such as the oil crisis have to be taken into account while interpreting the results⁵⁹.

For the analysis of income mobility the information about the individual earning points is used. Earnings points are calculated as follows: the individual gross monthly labour earnings which are due for social security contributions are divided by gross earnings per average employee⁶⁰. Therefore earnings points are dimension free as the division annuls the influence of all factors with the same effect on denominator and nominator⁶¹ – like the real economic activity – and deflation is unnecessary.

Table 2: Number of cases of the birth-cohorts 1916/1921 and 1940/1945

Data set	Number of cases	Data set	Number of cases
F-1916	2.886	F-1940	6.906
F-1921	7.396	F-1945	1.761
M-1916	3.930	M-1940	3.750
M-1921	6.456	M-1945	1.029

Source: Own calculations.

⁵⁸ Unfortunately the data set contains only few explanatory variables – it does not include any information about the household context of the individuals and not even about other income. See for a more detailed description Himmelreicher/Stegmann (2008) and Fachinger/Himmelreicher (im Erscheinen).

⁵⁹ Unfortunately period effects from the individual life cycle such as partnership formation or having children could not be considered with our data; see for the relevance of such effects e.g. Rigg/Sefton (2004).

⁶⁰ § 70 Book VI of the German Social Welfare Code (SGB VI) and Annex 1 Book V of the German Social Welfare Code (SGB V).

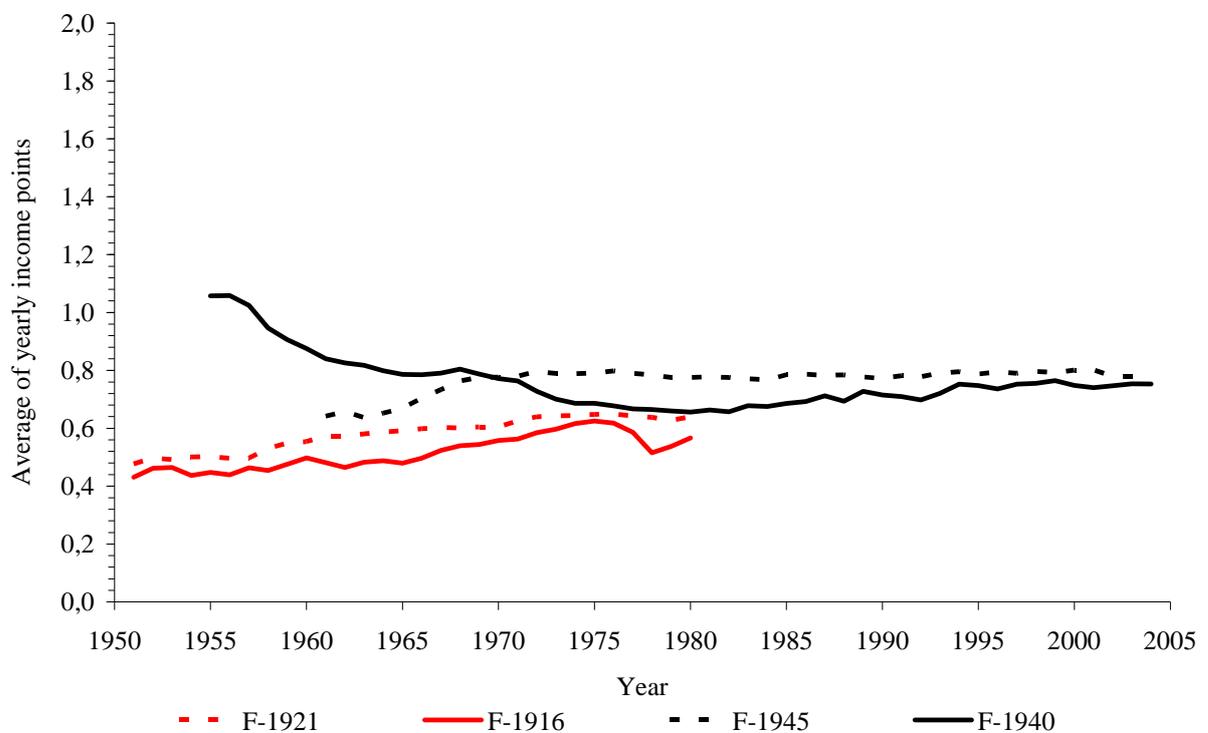
⁶¹ See e. g. Fachinger (1994), pp. 85, with numerous references.

5 Empirical Analysis

5.1 Income profiles

The income profiles shown in the following figures are quite different to the hypothetical ones in Figure 1. An invers-U-shape cannot be identified. The profile for women is rather flat over the working life with some minor variations around the overall trend. There are no period- (Figure 4) or age-effects (Figure 5)⁶². However, the profiles indicate a cohort effect as the profiles of the younger cohorts are higher for the most part of the working life.

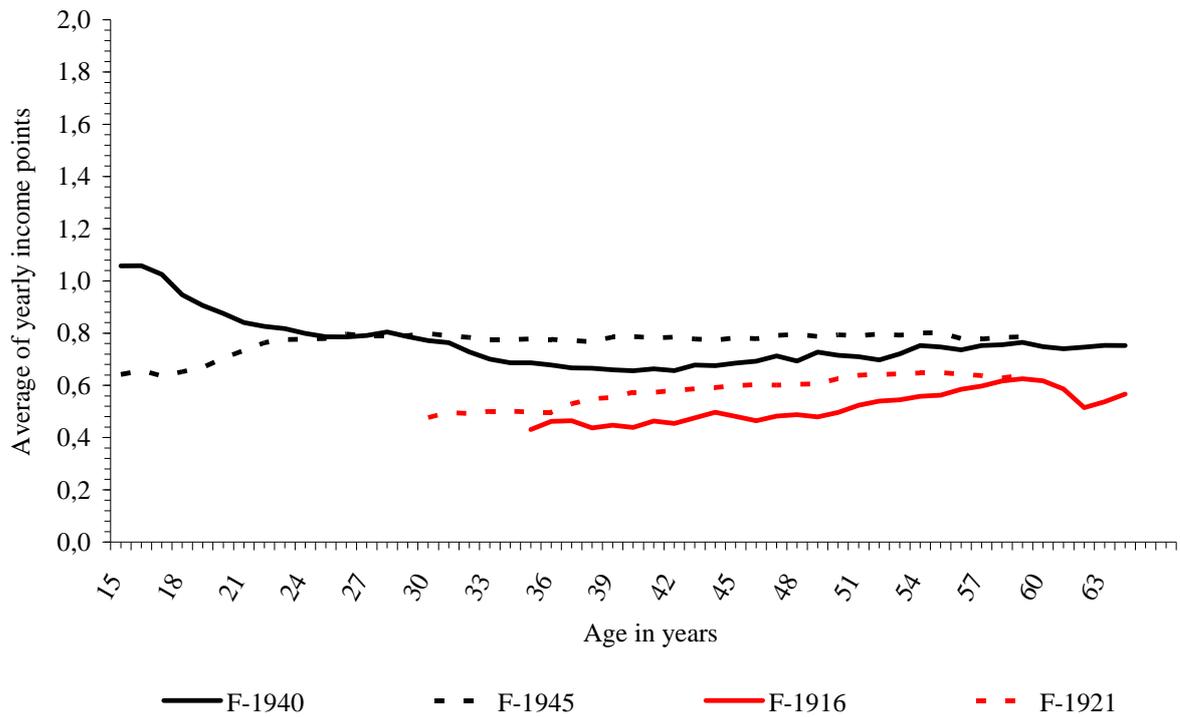
Figure 4: Income profiles of women



Source: FDZ-RV – SUF VVL2004, own calculation.

⁶² The high values at the beginning of the working careers are due to special legal regulations and do not reflect the income. On the contrary it is just the result of the entitlements expressed in earning points.

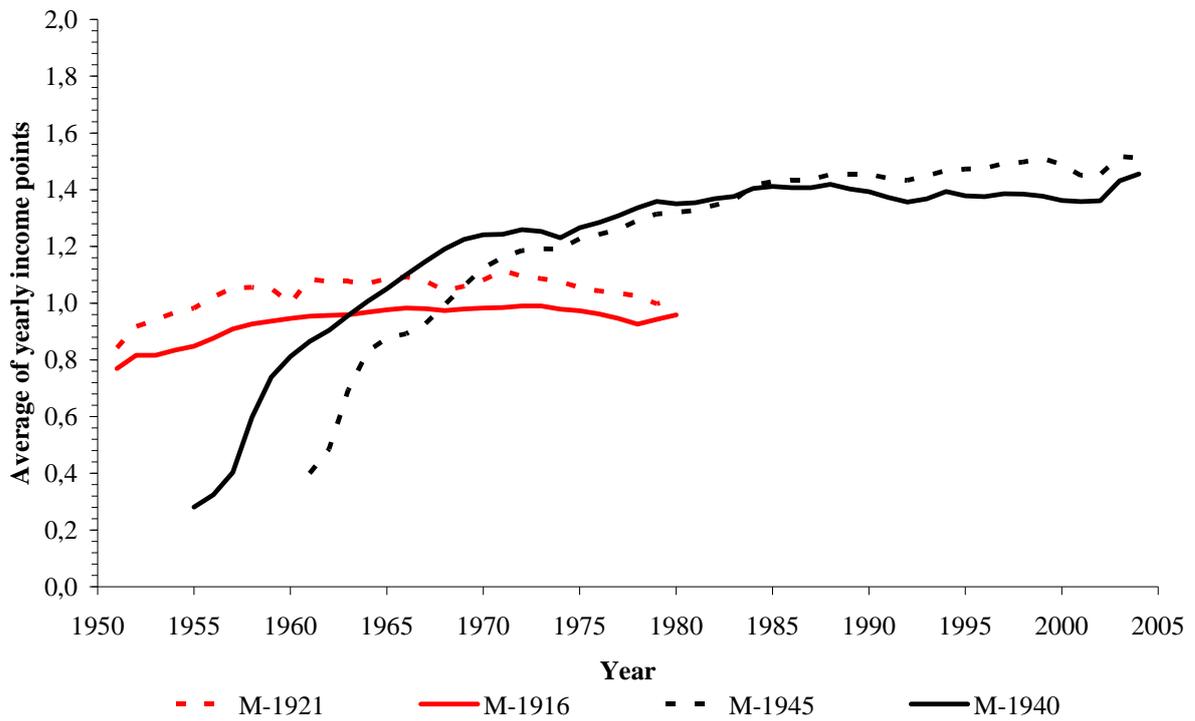
Figure 5: Income profiles of women over age



Source: FDZ-RV – SUF VVL2004, own calculation.

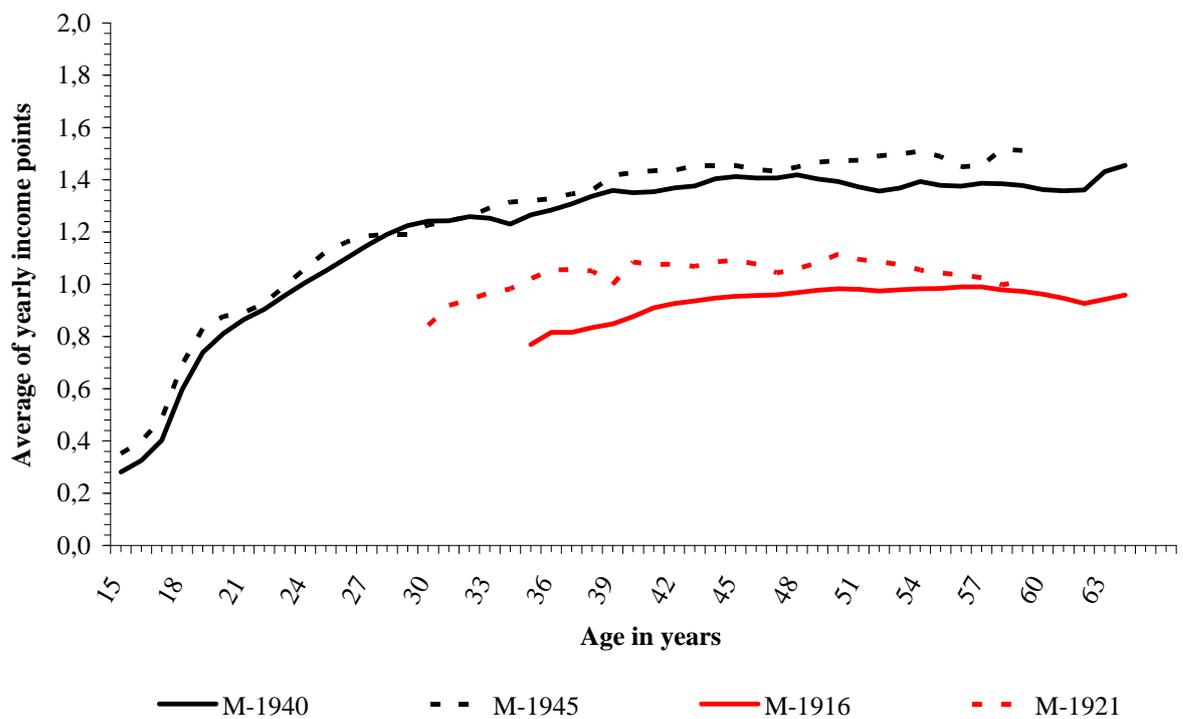
The profiles of men are quite different to the profiles of women. West-German men born in 1916 and 1921 have flat and lower age-income profiles compared to the younger cohorts. At the end of their working careers the average income positions are approximately as high as the average relative income positions of the total population, this are all insured women and men. The younger cohorts have increasing average age-income profiles and all in all a 30% higher income position.

Figure 6: Income profiles of men



Source: FDZ-RV – SUF VVL2004, own calculation.

Figure 7: Income profiles of men over age



Source: FDZ-RV – SUF VVL2004, own calculation.

Arguing along the line of concept 2, the so called positional mobility, and looking at the profiles in the following figures the subsequent hypotheses could be assumed. After entering the labour market

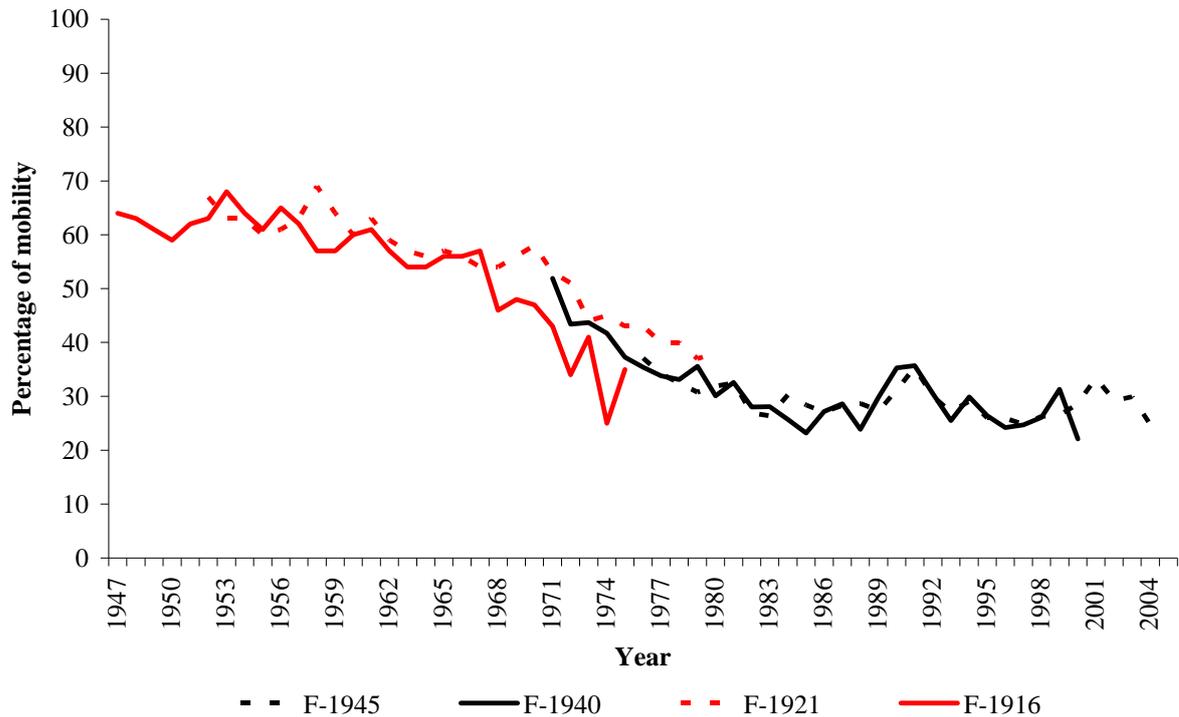
- for women, income mobility stays the same over the whole working life as no major upward or downward development can be identified in the income profiles (see Figure 4 and Figure 5).
- for men over a time span of about ten years upward income mobility will determine the income changes, but contrary to the profiles in Figure 1, in the phase after positioning in the distribution between ages 35 to 40, only minor mobility within the distribution will take place on average (see Figure 6 and Figure 7).

5.2 Mobility

5.2.1 Overall mobility

Analysing the overall mobility give some hints about the security of an income position and the chance of moving up or the risk of moving down within the income distribution. As the average individual income profiles are quite stable over the most part of working life, is this an indication for low income mobility?

Income mobility can be interpreted in the sense of “openness” of the distribution or flexibility of income position. In Figure 8 the development of the percentage of mobility – i.e. percentage of people, which are not in the same income class in the next year – is shown.

Figure 8: Income mobility of women over time

Source: FDZ-RV – SUF VVL2004, own calculation.

More than sixty percent of women have experiencing changes in their income position during the time from 1947 to the early 1970s, whereas more than thirty percent over the last twenty years changes their income situation within the distribution, i.e. one third of the female cohort members had instable positions.

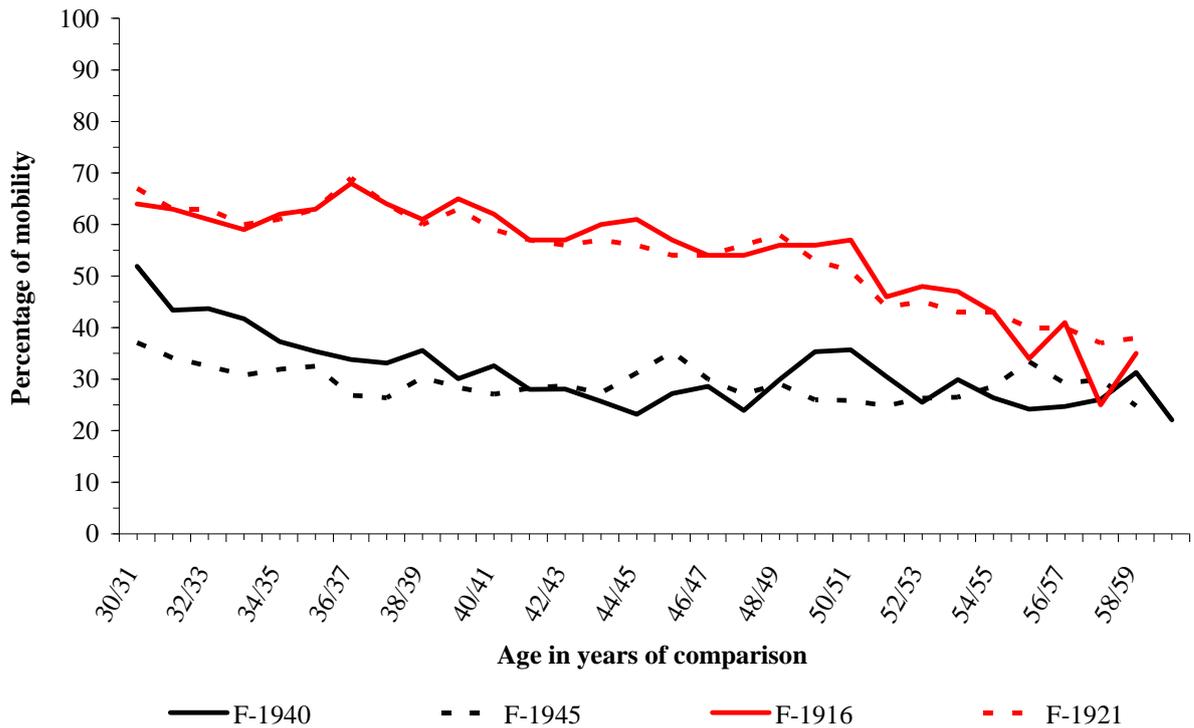
Overall, the development of income mobility of the analysed cohorts seems to be quite steady. The profiles show a decline of overall mobility until the early 1980s which corresponds to the economic development as after World War II the economy was prospering – especially in the 1960s. This came to an end culminating in the first oil price shock. During the 1970s the economy was full established – integrated into the world economy and therefore more depending on the international economic development. Since the early 1980s Germany had a full grown economy without any special circumstances. The decline of income mobility could also be interpreted as a sign of sclerotisation in the sense of Olson⁶³.

It seems as if period effects are influencing the income mobility as some up and downs in the profiles occur in the same year. For example, the effect of the breakdown of the GDR and the joining of the five newly-formed German states (1989 to 1992)

⁶³ Olson (1982).

However, if one analyses the income development and mobility over time, period-, age-, and cohort-effects have to be taken into account. To get an idea, whether age effects are relevant, in Figure 9 the data are printed against the calendrical age. In Figure 9 a more or less steady decline of income mobility for the older cohorts can be identified whereas for the two younger cohorts the mobility level remains more or less the same. A distinct age-effect for women can not be identified in the mobility profiles.

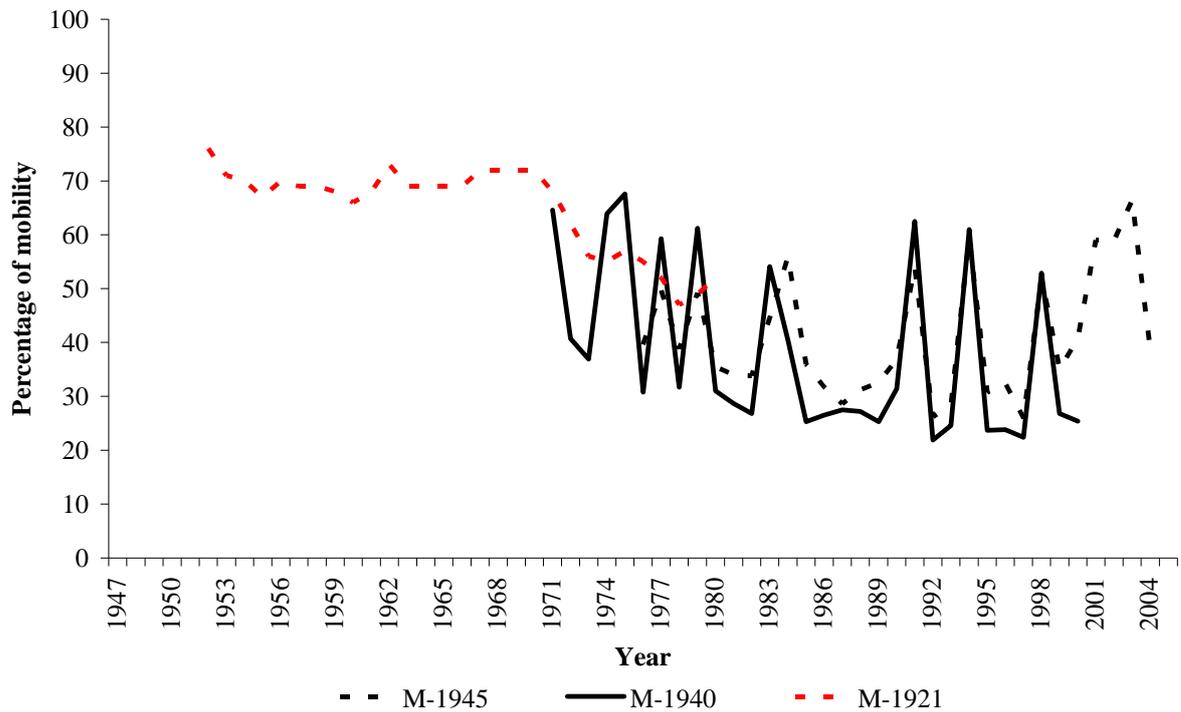
Figure 9: Income mobility of women over age



Source: FDZ-RV – SUF VVL2004, own calculation.

Unlike the profiles for women, the income mobility profiles of men show extremely large and unstructured variations over time for the two younger cohorts.

Figure 10: Income mobility of men



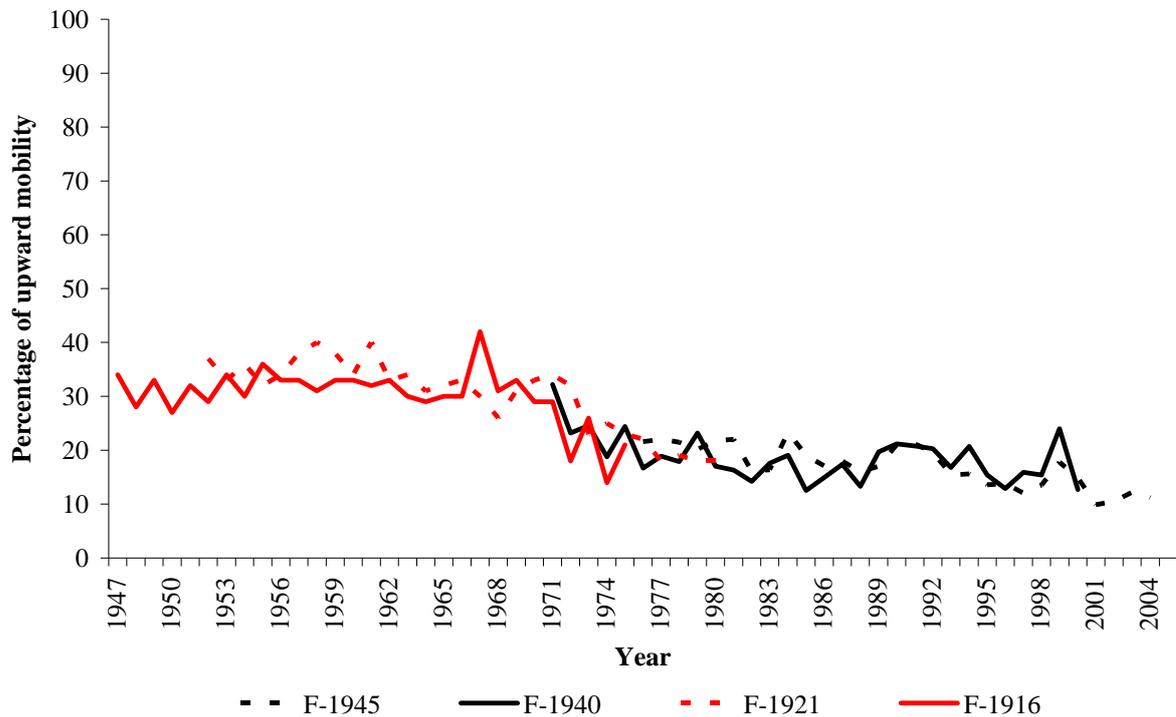
Source: FDZ-RV – SUF VVL2004, own calculation.

How much of mobility is upward mobility and how much is downward mobility? If some takes the theoretical income profile of Figure 1 serious, at the beginning of one’s career, the mobility should be overall upward.

5.2.2 Upward mobility

To get an impression about the possibility of improving its own income situation and whether the distribution is open for successful people, in Figure 11 the profile of upward mobility is shown.

Figure 11: Upward income mobility of women

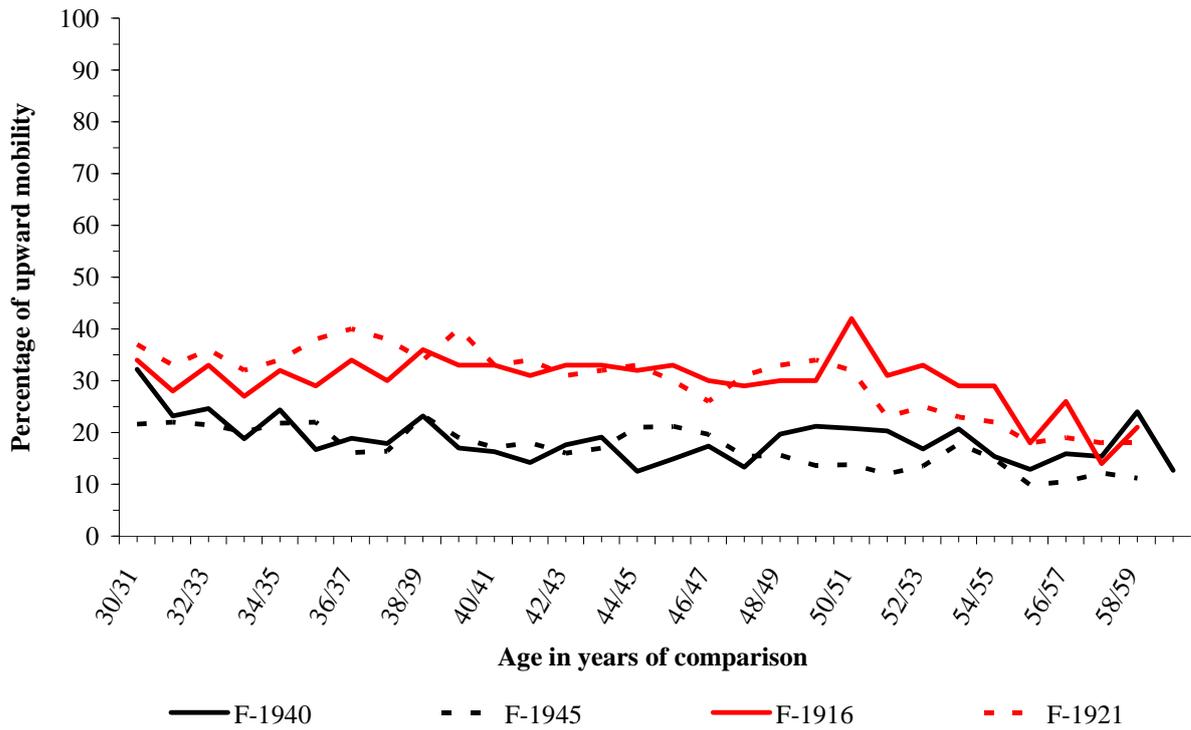


Source: FDZ-RV – SUF VVL2004, own calculation.

The overall structure of the upward mobility in Figure 11 looks like the structure of the mobility in Figure 8 – just on a lower level and without the drastic reduction over the 1970s. The upward mobility is around thirty percent until the mid 1970s and roughly twenty percent afterwards. Noteworthy is the time period between 1989 and 1995: The mobility during those years seems to consist mostly of income position improvement. This is an indication that period effects may influence the amount and direction of income mobility.

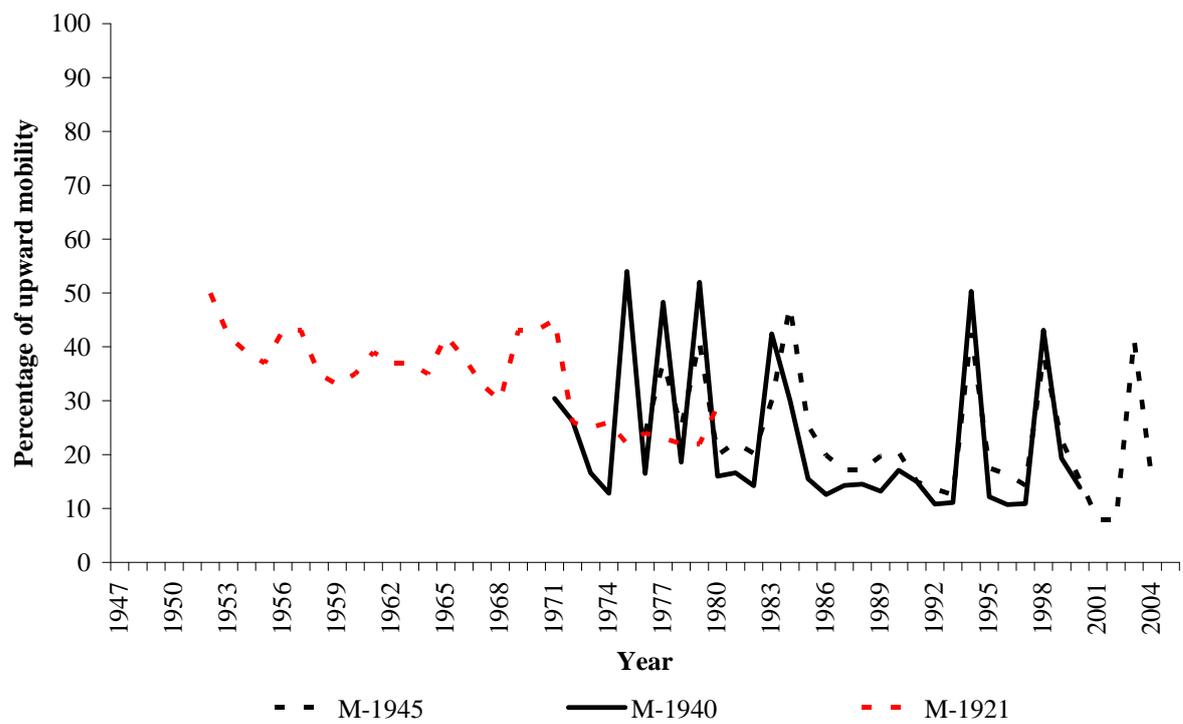
Regarding age-effects one would suggest that there would be a special “time path” as shown in Figure 1. At the beginning of ones career the upward mobility should be quite high but declining with work experience. However, the development of income mobility for women does not correspond very well with the profile in Figure 1. In Figure 12 the age profiles are represented. As can be seen, no indications of age effects are observable.

Figure 12: Upward income mobility of women over age



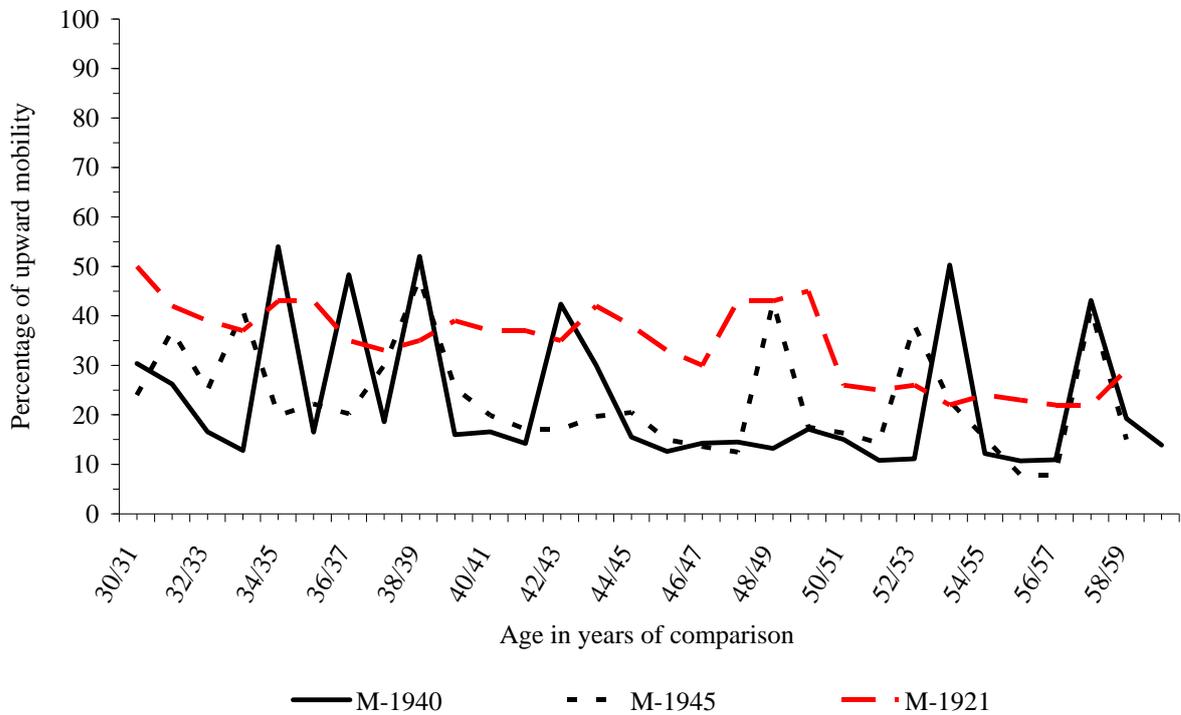
Source: FDZ-RV – SUF VVL2004, own calculation.

Figure 13: Upward income mobility of men



Source: FDZ-RV – SUF VVL2004, own calculation.

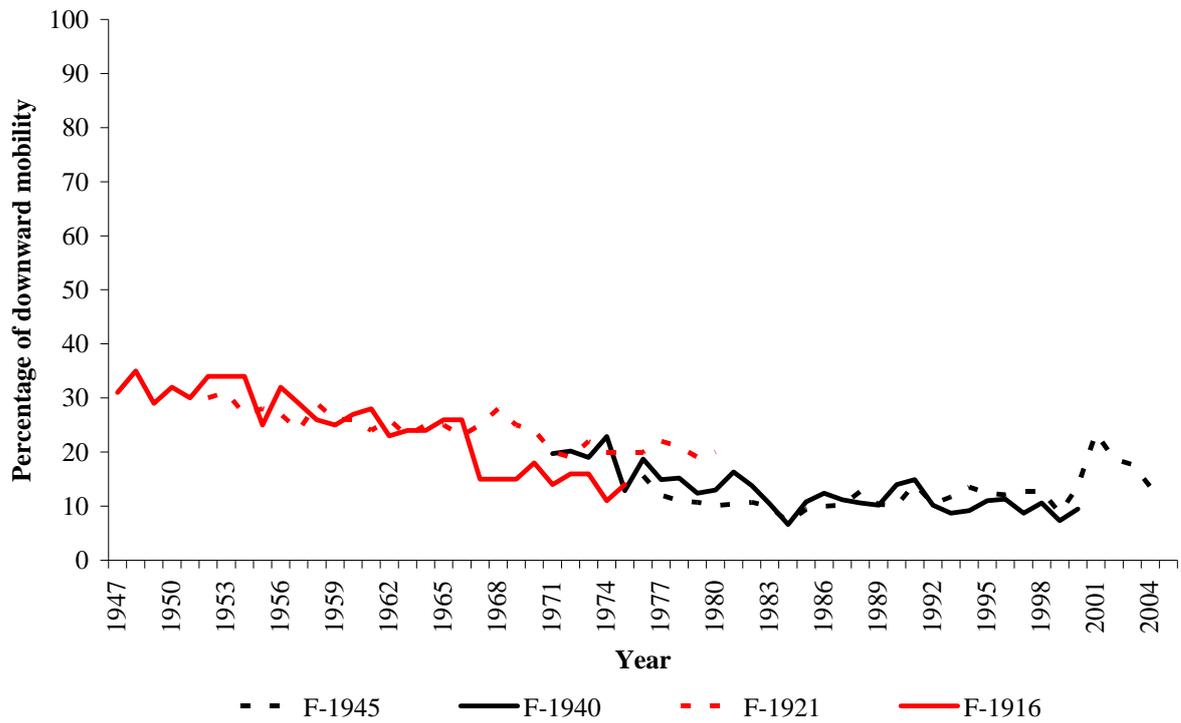
Figure 14: Upward income mobility of men over age



5.2.3 Downward mobility

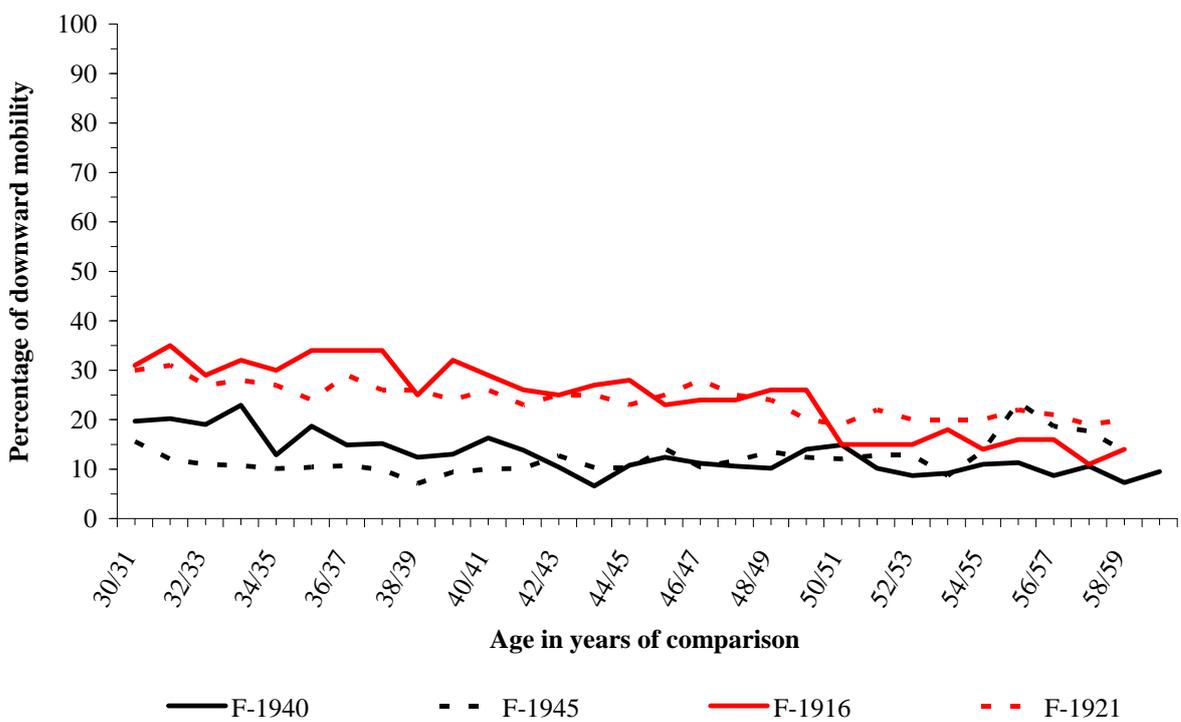
From a theoretical point of view, the development of downward mobility should be contrary to the upward mobility. That means that at the beginning of one's working life, downward mobility should be rather low and at the end it should be expected as rather high. However, just as for upward mobility, there is not such a development over time as can be seen in the following figures.

Figure 15: Downward mobility of women



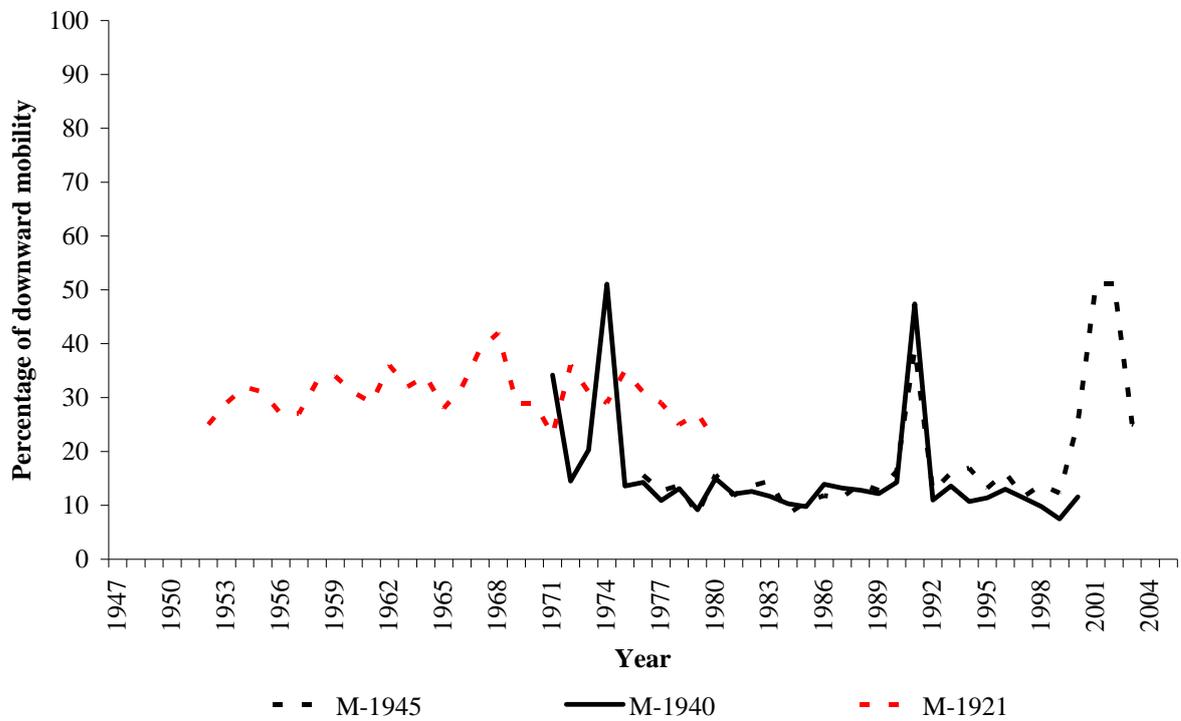
Source: FDZ-RV – SUF VVL2004, own calculation.

Figure 16: Downward income mobility of women over age

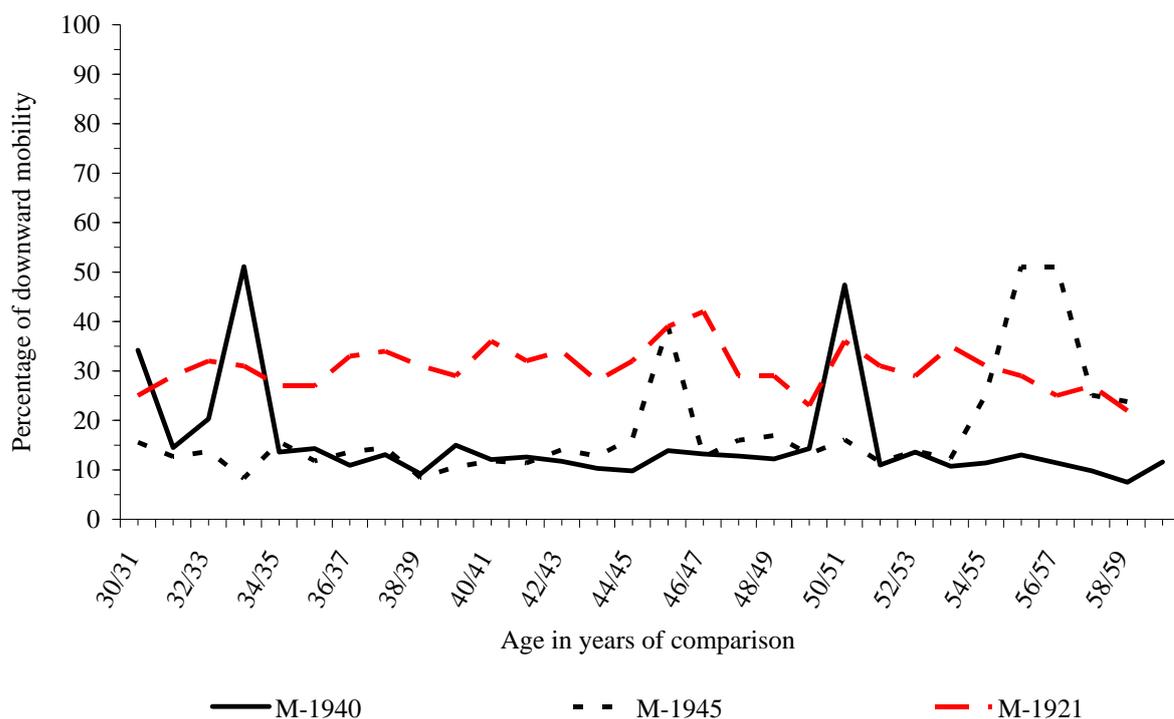


Source: FDZ-RV – SUF VVL2004, own calculation.

Figure 17: Downward mobility of men



Source: FDZ-RV – SUF VVL2004, own calculation.

Figure 18: Downward mobility of men over age

Source: FDZ-RV – SUF VVL2004, own calculation.

The amount of downward mobility and its development over time is comparable to the upward mobility. A specific structure, i. e. reflecting age-, cohort- or period-effects, can not be identified. It seems as if there is just a percentage of people – between twenty and thirty percent per year – “moving down” the income distribution.

6 Summary

With our data it was possible to cover a large time period – much larger than any other analysis has covered up to date – with different overall economic development, and to distinguish between age-, period- and cohort-effects.

The amount of mobility is surprisingly high: over fifty percent of the people are not staying in the same income class. For income from regular dependent employment without phases of unemployment, reduction of working time, and during a time of full employment (with mainly frictional unemployment) one would have thought that the component of permanent income would be higher – especially considering risk averse behaviour.

However, there is not such a general objective “optimal” degree regarding the “correct” amount of mobility – when is it too high and when will it be too low?

Our analysis shows that the development of individual profiles and income mobility does not correspond very well to assumptions of the human capital theory / life cycle theory with dominating upward mobility in the first ten or twenty years of the working life and dominating downward mobility afterwards.

“Transitory” income elements seem to be quite high⁶⁴. This is relatively remarkable as just one income source is analysed: the individual gross monthly labour earnings which are due for social security contributions. Income components such as interest earnings or self-employment income which are mainly seen as unsteady over time are not considered.

This is not a “good” result as the higher the transitory component, the lower the explanation power of theoretical models as transitory components are beyond economic explanation. Therefore the dominance of the transitory component restricts the analysis merely to a description of the income distribution and its development over time.

What determines the income mobility is still an open question, which could not be answered with our data. However, there are some indications for macro-economic effects. Individual income mobility seems to be higher during times of economic instability.

7 Literature

Aaberge, Rolf / Björklund, Anders / Jäntti, Markus / Palme, Mårten / Pedersen, Peder J. / Smith, Nina / Wennemo, Tom (2002): Income Inequality and Income Mobility in the Scandinavian Countries Compared to the United States, in: *Review of Income and Wealth* 48, Heft 4, S. 443-469.

Aaberge, Rolf / Mogstad, Magne (2008): On the Measurement of Long-Term Income Inequality and Income Mobility. Working Paper, Torino: Collegio Carlo Alberto, University of Torino.

Abatemarco, Antonio (2003): Measuring Income Mobility over Equivalent Adults. Working Papers of the Institute for Social and Economic Research paper 2003-15, Colchester: University of Essex.

Altonji, Joseph G. / Smith, Anthony / Vidangos, Ivan (2009): Modelling Earnings Dynamics. NBER Working Paper Series 14743, Cambridge, MA: National Bureau of Economic Research.

Amiel, Yoram / Cowell, Frank A. (2001): Risk and Inequality Perceptions. LSE STICERD Research Paper DARP 55, London: Centre for Analysis of Social Exclusion London School of Economics.

Atkinson, Anthony Barnes / Bourguignon, Francois / Morrisson, C. (1992): Empirical Studies of Earnings Mobility. Chur Reading Paris Philadelphia Tokyo Melbourne: Harwood Academic Publishers.

⁶⁴ A high degree of income mobility is also a result of the analysis of Cantó (2000) for Spain and Joseph Rowntree Foundation (1997) for Britain.

- Ayala, Luis / Navarro, Carolina / Sastre, Mercedes* (2006): Cross-Country Income Mobility Comparisons Under Panel Attrition: The Relevance of Weighting Schemes. ECINEQ Working Paper Series 47, Palma de Mallorca: Society for the Study of Economic Inequality (ECINEQ).
- Ayala, Luis / Sastre, Mercedes* (2008a): The structure of income mobility: empirical evidence from five EU countries, in: *Empirical Economics* 35, Heft 3, S. 451-473.
- Ayala, Luis / Sastre, Mercedes* (2008b): The structure of income mobility: empirical evidence from five UE countries, in: *Empirical Economics* 35, Heft, S. 451-473.
- Bager-Sjögren, Lars / Klevmarken, N. Anders* (1998): Inequality and Mobility of Wealth in Sweden, in: *Review of Income and Wealth* 44, Heft 4, S. 473-495.
- Bandyopadhyay, Sanghamitra / Cowell, Frank A.* (2006): Vulnerable Households and Variable Incomes. Discussion Paper DARP 79, London: Distributional Analysis Research Programme, Suntory and Toyota International Centres for Economics and Related Disciplines (STICERD) at the London School of Economics and Political Science.
- Baulch, Bob / Hoddinott, John* (2000): Economic mobility and poverty dynamics in developing countries, in: *Journal of Development Studies* 36, Heft 1, S. 1-24.
- Beenstock, Michael* (2004): Rank and Quantity Mobility in the Empirical Dynamics of Inequality, in: *Review of Income and Wealth* 50, Heft 4, S. 519-541.
- Behr, Andreas / Bellgardt, Egon / Rendtel, Ulrich* (2003): Comparing poverty, income inequality and mobility under panel attrition. Across-country comparison based on the European Community Household Panel. no. 12, . CHINTEX Working Paper 12 Germany Federal Statistical Office.
- Benabou, Roland / Ok, Efe A.* (1998): Social Mobility and the Demand for Redistribution: the POUM Hypothesis. Economic Research Reports RR # 98-23, New York: C.V. Starr Center for Applied Economics New York University Faculty of Arts and Science Department of Economics.
- Benabou, Roland / Ok, Efe A.* (2001a): Mobility as Progressivity: . NBER Working Paper Series 8431, Cambridge, MA: National Bureau of Economic Research.
- Benabou, Roland / Ok, Efe A.* (2001b): Mobility as Progressivity: Ranking Income Processes According to Equality of Opportunity. NBER Working Paper 8431, Cambridge, MA: National Bureau of Economic Research.
- Berntsen, Roland* (1992): Dynamik in der Einkommensverteilung privater Haushalte. Eine empirische Langschnittdanalyse für die Bundesrepublik. Frankfurt – New York: Campus.
- Bigard, Alan / Guillotin, Yves / Lucifora, Claudio* (1998): Earnings Mobility: An International Comparison of Italy and France, in: *Review of Income and Wealth* 44, Heft 4, S. 535-554.
- Börsch-Supan, Axel / Düzgün, Ismail / Weiss, Matthias* (2005): Altern und Produktivität: Zum Stand der Forschung. MEA Discussion Paper.
- Bosworth, Barry / Burtless, Gary / Sahm, Claudia* (2001): The Trend in Lifetime Earnings Inequality and Its Impact on the Distribution of Retirement Income. Center for Retirement Research Working Papers CRR WP 2001-03, Chestnut Hill, MA: Center for Retirement Research at Boston College.

- Brenner, Jan* (2009): Life-Cycle Variations in the Association between Current and Lifetime Earnings – Evidence for German Natives and Guest Workers. Ruhr Economic Papers 95, Bochum, Dortmund, Duisburg, Essen: Ruhr-Universität Bochum (RUB), Department of Economics, Technische Universität Dortmund, Department of Economic and Social Sciences, Universität Duisburg-Essen, Department of Economics, Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI).
- Bristol, Ralph B. jr* (1958): Factors Associated with Income Variability, in: American Economic Review 48, Heft, S. 279-290.
- Brodaty, Thibault* (2007): Introducing unobserved heterogeneity in Earnings Mobility. Séries des Documents de Travail du CREST (Centre de Recherche en Economie et Statistique 2007-35, Paris: Institut National de la Statistique et des Etudes Economiques.
- Büchel, Felix / Frick, Joachim R. / Zaidi, Asghar* (2004): Income Mobility in Old Age in Britain and Germany. LSE STICERD Research Paper 89, London: Centre for Analysis of Social Exclusion London School of Economics.
- Buchinsky, Mosche / Fields, Gary S. / Fougère, Denis / Kramarz, Francis* (2003): Francs or Ranks? Earnings Mobility in France, 1967-1999. Discussion Paper Series 3937, London: Centre for Economic Policy Research CEPR.
- Buchinsky, Moshe / Hunt, Jennifer* (1999): Wage mobility in the United States, in: The Review of Economics and Statistics 81, Heft 3, S. 351-368.
- Bundesregierung* (2001): Unterrichtung durch die Bundesregierung. Lebenslagen in Deutschland. Erster Armuts- und Reichtumsbericht. Bundestags-Drucksache. Berlin: Deutscher Bundestag. 14/5990.
- Bundesregierung* (2005): Unterrichtung durch die Bundesregierung. Lebenslagen in Deutschland - Zweiter Armuts- und Reichtumsbericht. Bundestags-Drucksache. Berlin: Deutscher Bundestag. 15/5015.
- Bundesregierung* (2009): Unterrichtung durch die Bundesregierung. Lebenslagen in Deutschland – Dritter Armuts- und Reichtumsbericht. Bundestags-Drucksache. Soziales, Bundesministerium für Arbeit und. Berlin: Deutscher Bundestag. 16/9915.
- Burgess, Simon / Gardiner, Karen / Jenkins, Stephen P. / Propper, Carol* (2000): Measuring Income Risk. CASEpaper 40, London: ESRC Research Centre for Analysis of Social Exclusion (CASE), London School of Economic.
- Cantó, Olga* (2000): Income Mobility in Spain: How much is there?, in: Review of Income and Wealth 46, Heft 1, S. 85-102.
- Chen, Wen-Hao* (2009): Cross-national Differences in Income Mobility: Evidence form Canada, the United States, Great Britain and Germany, in: Review of Income and Wealth 55, Heft 1, S. 75-100.
- Clark, Andrew E.* (2003): Inequality-Aversion and Income Mobility : A Direct Test. Working Paper 2003-11, Paris: Département et Laboratoire d'Economie Théorique et Appliquée (DELTA).

- Congressional Budget Office (CBO) (2007): Trends in Earnings Variability Over the Past 20 Years. Letter to the Honorable Charles E. Schumer and the Honorable Jim Webb. April 17, 2007. Washington, DC: Congressional Budget Office (CBO), U.S. Congress.*
- Contini, Bruno / Leombruni, Roberto / Pacelli, Lia / Villosio, Claudia (2007): Wage Mobility and Dynamics in Italy in the 90's. NBER Working Paper 13029, Cambridge, MA: National Bureau of Economic Research.*
- Cowell, Frank A. / Schluter, Christian (1998): Income Mobility: A Robust Approach. LSE STICERD Research Paper DARP 37, London: Centre for Analysis of Social Exclusion London School of Economics.*
- Cruces, Guillermo (2005): Income Fluctuations, Poverty and Well-Being Over Time: Theory and Application to Argentina. Discussion Paper DARP 76, London: Distributional Analysis Research Programme, Suntory and Toyota International Centres for Economics and Related Disciplines (STICERD) at the London School of Economics and Political Science.*
- De Fontenay, Catherine / Gørgens, Tue / Liu, Haoming (2002): The Role of Mobility in Offsetting Inequality: A Nonparametric Exploration of the CPS, in: Review of Income and Wealth 48, Heft 3, S. 347-370.*
- Deaton, Angus S. (1992): Understanding Consumption. Oxford: Clarendon Press.*
- Dickens, Richard / McKnight, Abigail (2008a): Changes in earnings inequality and mobility in Great Britain 1978/9-2005/6. CASEpaper 132, London: ESRC Research Centre for Analysis of Social Exclusion (CASE), London School of Economic.*
- Dickens, Richard / McKnight, Abigail (2008b): The changing pattern of earnings: employees, migrants and low-paid families. Findings. York: Joseph Rowntree Foundation.*
- Dragoset, Lisa M. / Fields, Gary S. (2007): Validating U.S. Earnings Mobility Measures. ILR Collection Working Papers Cornell University.*
- Duncan, Greg J. / Hill, Martha S. (1985): Conceptions of longitudinal households: fertile or futile, in: Journal of Economic and Social Measurement 13, Heft 3-4, S. 361-375.*
- Fabig, Holger (1999a): Einkommensmobilität im internationalen Vergleich. Eine empirische Mobilitätsanalyse mit Panel-Daten. Frankfurt – New York: Campus.*
- Fabig, Holger (1999b): Income Mobility and the Welfare State: an International Comparison with Panel Data, in: Journal of European Social Policy 9, Heft 4, S. 331-349.*
- Fachinger, Uwe (1991): Lohnmobilität in der Bundesrepublik Deutschland. Eine Untersuchung auf der Basis von prozeßproduzierten Längsschnittdaten der gesetzlichen Rentenversicherung. Berlin: Duncker & Humblot.*
- Fachinger, Uwe (1994): Lohnentwicklung im Lebensablauf. Empirische Analysen für die Bundesrepublik Deutschland anhand von prozeßproduzierten Längsschnittdaten. Frankfurt – New York: Campus.*
- Fachinger, Uwe / Himmelreicher, Ralf K. (2007): Alterslohnprofile und Qualifikation in den alten Bundesländern – empirische Analysen auf Datenbasis des Längsschnittdatensatzes SUF VVL 2004, in: Deutsche Rentenversicherung 62, Heft 11-12, S. 750-770.*

- Fachinger, Uwe / Himmelreicher, Ralf K.* (im Erscheinen): Alters-Lohn-Profile und Einkommensdynamik von westdeutschen Männern im späten Erwerbsleben, in: Deutsche Rentenversicherung Bund (Hrsg.): Erfahrungen und Perspektiven. Bericht vom dritten Workshop des Forschungszentrums der Rentenversicherung (FDZ-RV) vom 26. bis 28. Juni 2006 in Bensheim. DRV-Schriften 55/2006. Bad Homburg: WDV Wirtschaftsdienst, S. 82-94.
- Fields, Gary S.* (2001): *Distribution and Development: A New Look at the Developing World*. New York: MIT Press and Russell Sage Foundation.
- Fields, Gary S.* (2004): *Economic and Social Mobility Really Are Multifaceted*. ILR Collection Working Papers 1, Ithaca, NY: School of Industrial and Labor Relations, Cornell University.
- Fields, Gary S.* (2007): *Income Mobility*. ILR Collection Working Papers 19, Ithaca, NY: School of Industrial and Labor Relations, Cornell University.
- Fields, Gary S.* (2008): *Does Income Mobility Equalize Longer-Term Incomes? New Measures of an Old Concept*. ILR Collection Working Papers 13, Ithaca, NY: School of Industrial and Labor Relations, Cornell University.
- Fields, Gary S. / Hernández, Robert Duval / Rodríguez, Samuel Freije / Sánchez Puerta, María Laura* (2006): *Income Mobility in Latin America*. ILR Collection Working Papers 12, Ithaca, NY: School of Industrial and Labor Relations, Cornell University.
- Fields, Gary S. / Ok, Efe A.* (1996): *The Meaning and the Measurement of Income Mobility*, in: *Journal of Economic Theory* 71, Heft, S. 349-377.
- Fields, Gary S. / Ok, Effe A.* (1999): *The measurement of income mobility: An introduction to the literature*, in: Silber, J. (Hrsg.): *Handbook of Income Inequality Measurement*. Deventer: Kluwer, S. 557–596.
- Gardiner, Karen / Hills, John* (1999): *Policy implications of new data on income mobility*, in: *The Economic Journal* 109, Heft 453, S. 91-111.
- Gottschalk, Peter / Danziger, Sheldon* (1997): *Family Income Mobility - How Much Is There and Has It Changed?* Boston College Working Papers in Economics 398, Chestnut Hill, MA: Boston College, Department of Economics.
- Gottschalk, Peter / Huynh, Minh* (2006): *Are Earnings Inequality and Mobility Overstated? The Impact of Non-Classical Measurement Error*. Working Paper.
- Grabka, Markus M. / Frick, Joachim R.* (2008): *Schrumpfende Mittelschicht – Anzeichen einer dauerhaften Polarisierung der verfügbaren Einkommen?*, in: *DIW-Wochenbericht* 75, Heft 10, S. 101-108.
- Habich, Roland / Spéder, Zsolt* (2000): *Continuous Changes - Different Variations. Income Distribution and Income Dynamics in Three Societies*, in: *Review of Sociology of the Hungarian Sociological Association*, , Heft Special Issue, S. 14-93.
- Hauser, Richard / Becker, Irene / Grabka, Markus M. / Westerheide, Peter* (2007): *Integrierte Analyse der Einkommens- und Vermögensverteilung. Abschlussbericht zur Studie im Auftrag des Bundesministeriums für Arbeit und Soziales, Bonn (VKZ 06 01 03), der Bietergemeinschaft Deutsches Institut für Wirtschaftsforschung Berlin (DIW Berlin, Koordinator: Dr. Markus M.*

- Grabka), Zentrum für Europäische Wirtschaftsforschung GmbH (ZEW Mannheim, Koordinator: Dr. Peter Westerheide), Prof. Dr. Richard Hauser, Universität Frankfurt am Main, Dr. Irene Becker, Riedstadt. 5. Dezember 2007. Bonn: Bundesministeriums für Arbeit und Soziales.
- Hauser, Richard; / Fabig, Holger* (1999): Labor Earnings and Household Income Mobility in Reunified Germany: A Comparison of the Eastern and Western States, in: *Review of Income and Wealth* 45, Heft 3.
- Hills, John* (1999): Introduction: What do we mean by reducing lifetime inequality and increasing mobility?'. *Proceedings of the Persistent poverty and lifetime inequality: The Evidence*. London: Centre for Analysis of Social Exclusion, London School of Economics.
- Hills, John / Smithies, Rachel / McKnight, Abigail* (2006): *Tracking Income: How Working Families Incomes Vary Through the Year*. CASEreport. 32. London: ESRC Research Centre for Analysis of Social Exclusion, The London School of Economics and Political Science.
- Himmelreicher, Ralf K. / Stegmann, Michael* (2008): New Possibilities for Socio-Economic Research through Longitudinal Data from the Research Data Centre of the German Federal Pension Insurance (FDZ-RV), in: *Schmollers Jahrbuch* 128, Heft 4, S. 647 – 660.
- Hofer, Helmut / Weber, Andrea* (2001): *Wage Mobility in Austria 1986–1996*. Reihe Ökonomie - Economics Series. Wien: Institut für Höhere Studien (IHS), Institute for Advanced Studies.
- Holtz-Eakin, Douglas / Rosen, Harvey S. / Weathers, Robert* (2000): *Horatio Alger Meets the Mobility Tables*. NBER Working Paper 7619, Cambridge, MA: National Bureau of Economic Research.
- Jarvis, Sarah / Jenkins, Stephen P.* (1998): How much Income Mobility is there in Britain?, in: *The Economic Journal* 108, Heft, S. 428-443.
- Jenkins, Stephen* (1998): *Income Mobility and Poverty Dynamics*, in: Lee, A. / Hills, J. (Hrsg.): *New Cycles of Disadvantage?*, CASE report 1. London: London School of Economics, S. 8-10.
- Jenkins, Stephen P. / Van Kerm, Philippe* (2003): *Trends in income inequality, pro-poor income growth and income mobility*. Discussion Papers 377, Berlin: Deutsches Institut für Wirtschaftsforschung (DIW) Berlin - German Institute for Economic Research.
- Joseph Rowntree Foundation* (1997): *Income mobility in Britain*. Social Policy Research. July 1997. York: Joseph Rowntree Foundation.
- Kaufmann, Franz-Xaver* (1970): *Sicherheit als soziologisches und sozialpolitisches Problem*. Untersuchungen zu einer Wertidee hochdifferenzierter Gesellschaften. Stuttgart: Enke.
- Klevmarken, N. Anders* (1993): *Wage rate mobility and measurement errors: an application to Swedish panel data*, in: Casson, Mark / Creedy, John (Hrsg.): *Industrial Concentration and Economic Inequality: Essays in Honour of Peter Hart*. Cheltenham, UK: Edward Elgar.
- Klevmarken, N. Anders* (2004): *On the Wealth Dynamics of Swedish Families, 1984-98*, in: *Review of Income and Wealth* 50, Heft 4, S. 469-491.
- Kliegl, Reinhold / Mayr, Ulrich* (1997): *Kognitive Leistungen und Lernpotential im höheren Erwachsenenalter*, in: Weinert, Franz E. / Mandl, Heinz (Hrsg.): *Enzyklopädie der Psychologie - Pädagogische Psychologie*. Psychologie der Erwachsenenbildung, 4. Göttingen: Hogrefe, S. 87-116.

- Klodt, Henning* (1998): Großbritannien: Die marktwirtschaftliche Strategie, in: *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung* 31, Heft 2, S. 277-293.
- Kopczuk, Wojciech / Saez, Emmanuel / Song, Jae* (2007): *Uncovering the American Dream: Inequality and Mobility in Social Security Earnings Data since 1937*. NBER Working Paper Series 13345, Cambridge, MA: National Bureau of Economic Research.
- Lünnemann, Patrick / Wintr, Ladislav* (2009): *Wages are flexible, aren't they? Evidence from monthly micro wage data*. Wage Dynamics Network Working Paper Series 1074, Frankfurt: European Central Bank.
- Maasoumi, E / Trede, Mark* (2001): *Comparing income mobility in Germany and the United States using generalized entropy mobility measures*, in: *Review of Economics and Statistics* 83, Heft 3, S. 551-559.
- Meier, Christoph* (1983): *Lebenszyklus und ökonomische Ungleichheit: Eine Analyse der Einkommens- und Vermögensdynamik anhand von Längsschnittdaten*. Freiburg, Schweiz: Universitätsverlag.
- Merz, Joachim / Kirsten, Dagmar* (1998): *Extended Income Inequality and Poverty Dynamics of Labour Market and Household Activities A Ten Years Microanalysis with the German Socio-Economic Panel*. FFB Discussion Paper 25, Lüneburg: University of Lüneburg, Department of Economic and Social Sciences, Research Institute on Professions (FFB).
- Millimet, Daniel / Podder, Nripesh / Slottje, Daniel / Zandvakili, Sourushe* (2003): *Bounding Lifetime Income Using a Cross Section of Data*, in: *Review of Income and Wealth* 49, Heft 2, S. 205-219.
- Mitra, Tapan / Ok, E. A.* (1998): *The Measurement of Income Mobility: A Partial Ordering Approach*, in: *Journal of Economic Theory* 12, Heft 1, S. 77-102.
- Müller, Klaus / Frick, Joachim* (1997): *Die Äquivalenzeinkommensmobilität in den neuen und alten Bundesländern 1990 bis 1994*, in: *Hradil, Stefan / Pankoke, Eckart (Hrsg.): Aufstieg für alle? Beiträge zu den Berichten zum sozialen und politischen Wandel in Ostdeutschland. Beiträge zum Bericht 2 "Ungleichheit und Sozialpolitik". Beiträge zum Bericht 2 "Ungleichheit und Sozialpolitik", 2.2. Opladen: Leske + Budrich, S. 103-154.*
- Myck, Michal* (2007): *Wages and Ageing: Is there Evidence for the "Inverse-U" Profile?* Berlin: Deutsches Institut für Wirtschaftsforschung.
- Olson, Mancur* (1982): *The Rise and Decline of Nations*. New Haven - London: Yale University Press.
- Organisation for Economic Co-Operation and Development OECD* (Hrsg.) (1996): *Earnings inequality, low-paid employment and earnings mobility*. Employment Outlook. Paris: Organisation for Economic Co-Operation and Development OECD.
- Österberg, Torun* (2000): *Intergenerational Income Mobility in Sweden: What do Tax-Data Show?*, in: *Review of Income and Wealth* 46, Heft 4, S. 421-436.
- Pendakur, Krishna* (1998): *Changes in Canadian Family Income and Family Consumption Inequality between 1978 and 1992*, in: *The Review of Income and Wealth* 44, Heft 2, S. 259-283.

- Polachek, Salomon W. / Siebert, W. Stanley* (1993): *The Economics of Earnings*. Cambridge: Cambridge University Press.
- Ramos, Xavier* (2003): *The Covariance Structure of Earnings in Great Britain, 1991–1999*, in: *Economica* 70, Heft 278, S. 353-375.
- Rendtel, Ulrich / Langeheine, Rolf / Berntsen, Roland* (1993): *The Estimation of Poverty-Dynamics Using Different Measurements of Household Income*, in: *The Review of Income and Wealth* 44, Heft, S. 81-98.
- Rendtel, Ulrich / Schwarze, Johannes* (1991): *Die Entwicklung der individuellen Arbeitseinkommen von 1984 bis 1989. Ein explorative Analyse von Paneldaten*, in: Rendtel, Ulrich / Wagner, Gert G. (Hrsg.): *Lebenslagen im Wandel - Zur Einkommensdynamik in Deutschland seit 1984*. Frankfurt - New York: Campus, S. 63-99.
- Rigg, John / Sefton, Tom* (2004): *Income Dynamics and the Life Cycle*. CASEpaper 81, London: ESRC Research Centre for Analysis of Social Exclusion (CASE), London School of Economic.
- Rohwer, Götz* (1991): *Einkommensmobilität privater Haushalte 1984-1989*, in: Rendtel, Ulrich / Wagner, Gert (Hrsg.): *Lebenslagen im Wandel: Zur Einkommensdynamik in Deutschland seit 1984*. Frankfurt - New York: Campus, S. 379-408.
- Ruiz-Castillo, Javier* (2004): *The measurement of structural and exchange income mobility*, in: *Journal of Economic Inequality* 2, Heft, S. 219–228.
- Sarachek, Bernard* (1978): *American Entrepreneurs and the Horatio Alger Myth*, in: *Journal of Economic History* 38, Heft, S. 439-456.
- Sastri Madduri, V. B. N.* (1976): *Stochastic Indicators of Income Mobility*, in: *Social Indicators Research* 3, Heft, S. 423-429.
- Schäfer, Hermann* (1981): *Arbeitsverdienst im Lebenszyklus - Zur Einkommensmobilität von Arbeitern*, in: *Archiv für Sozialgeschichte* 21, Heft, S. 237-267.
- Schluter, Christian* (1997): *On the Non-Stationarity of German Income Mobility (and some observations on poverty dynamics)*. LSE STICERD Research Paper DARP 30, London: Centre for Analysis of Social Exclusion London School of Economics.
- Schluter, Christian* (1998): *Income Dynamics in Germany, the USA and the UK: Evidence from Panel Data*. LSE STICERD Research Paper CASE 008, London: London School of Economics.
- Schluter, Christian / Trede, Mark* (2003): *Local versus Global Assessment of Mobility*, in: *International Economic Review* 44, Heft 4, S. 1313-1335.
- Schluter, Christian / Van de Gaer, Dirk* (2003): *Mobility as distributional difference*. Working Paper 2003/182, Gent: Universiteit Gent, Faculteit Economie en Bedrijfskunde.
- Schmähl, Winfried / Fachinger, Uwe* (1989): *Über Richtung und Ausmaß der Lohnmobilität - Eine Kohortenanalyse für Arbeiter in der Bundesrepublik Deutschland von 1960 bis 1970*, in: Gerlach, Knut / Hübler, Olaf (Hrsg.): *Effizienzlohntheorie, Individualeinkommen und Arbeitsplatzwechsel*. Frankfurt - New York: Campus, S. 274-298.

- Silber, Jacques / Weber, Michal* (2008): The Generalized Gini index and the measurement of income mobility, in: *Economics Bulletin* 4, Heft, S. 1-7.
- Sinn, Hans-Werner* (1980): *Ökonomische Entscheidungen bei Unsicherheit*. Tübingen: Mohr.
- Skirbekk, Vegard* (2004): Age and Individual Productivity: A Literature Survey, in: Feichtinger, Gustav (Hrsg.): *Vienna Yearbook of Population Research*. Wien: Austrian Academy of Sciences Press, S. 133-153.
- Skirbekk, Vegard* (2008): Age and Productivity Capacity: Descriptions, Causes and Policy Options, in: *Ageing Horizons* 8, Heft, S. 4-12.
- Smith, Patricia K.* (1994): Recent Patterns in Downward Income Mobility: Sinking Boats in a Rising Tide, in: *Social Indicators Research* 31, Heft, S. 277-303.
- Solon, Gary* (1992): Intergenerational Income Mobility in the United States., in: *The American Economic Review* 82, Heft, S. 393-408.
- Sopp, Peter* (2005): *Abspaltung oder Polarisierung? Einkommensungleichheit und Einkommensmobilität in Deutschland 1984 - 2000*. Berlin: Logos.
- Trede, Mark* (1997): *Statistische Messung der Einkommensmobilität*. Göttingen: Vandenhoeck & Ruprecht.
- Trede, Mark* (1998): Einkommensmobilität, in: Bundesamt, Statistisches (Hrsg.): *Einkommen und Vermögen in Deutschland – Messung und Analyse*, 32. Wiesbaden: Metzler-Poeschl, S. 89-109.
- Van Kerm, Philippe* (2003): *What Lies Behind Income Mobility? Reranking and Distributional Change in Belgium, Western Germany and the USA*. IRISS Working Paper Series, Luxembourg: IRISS at CEPS/INSTEAD.
- Van Kerm, Philippe* (2006): *Comparisons of income mobility profiles*. ISER Working Paper 2006-36, Colchester: Institute for Social and Economic Research (ISER), University of Essex.
- Wagner, Gert G. / Frick, Joachim R. / Schupp, Jürgen* (2007): The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements, in: *Schmollers Jahrbuch* 127, Heft 1, S. 139-169.
- Yaqub, Shahin* (2000): *Intertemporal Welfare Dynamics*. Background Paper for Human Development Report (HDR) 2001. Falmer Brighton: Poverty Research Unit AFRAS, Sussex University.
- Zaidi, Asghar / Frick, Joachim R. / Büchel, Felix* (2004): *Income Mobility in Old Age in Britain and Germany*. CASEpaper 89, London: Centre for Analysis of Social Exclusion London School of Economics.
- Zimprich, Daniel* (2004): Kognitive Leistungsfähigkeit im Alter, in: Kruse, Andreas / Martin, Mike (Hrsg.): *Enzyklopedie der Gerontologie*. Bern: Huber, S. 289-303.