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Income and Wealth Poverty in Germany

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Income and Wealth Poverty in Germany

Abstract. In general, poverty measures are estimated by applying income information. However, only using income data for calculating relative poverty might lead to an incomplete view. For example, a household can be under a poverty threshold even if a household member owns real estate or equity.
In this thesis, at risk of income poverty in Germany is estimated. In order to get a more complete picture of at risk of poverty, a multidimensional approach is applied. Not only at risk of income poverty, also at risk of wealth poverty is measured. Moreover, households that are both at risk of income and wealth poor are analyzed. Furthermore, several poverty groups are identified: twice-poor which are households that are, at risk of income and wealth poverty; protected-poor, households that are at risk of income poverty but not at risk of wealth poverty; vulnerable-poor, households which are at risk of wealth poverty but not at risk of income poverty; non-poor, households which are either at risk of income poverty nor at risk of wealth poverty. Poverty profiles in Germany and their changes over time are analyzed for the years 2002, 2007 and 2012. In fact, it is investigated to which degree at risk of poverty rates differ in socio-economic characteristics. A logit regression is applied for each dimension and each wave for estimation. For robustness checks, 95 percent bootstrap confidence intervals are calculated for all results.
Findings suggest that young age, region East Germany, single, lone parent, unemployment and low education are factors that condition the at risk of poverty rates. The definition of a certain rate influences the percentage of households that are affected by at risk of poverty, however, has a limited effect on poverty profiles. Poverty profiles have not changed over time but some factors such as unemployment and low education have significantly increased.

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1 Introduction

Measuring poverty is a controversial topic. The extent of poverty depends on the methodology and definition of poverty applied by the researcher. According to the European Commission (EC), individuals and families are defined as poor if they are excluded from the minimum acceptable lifestyle in terms of material, social and cultural means in the country they live. That sounds reasonable, but how can a minimum of acceptable lifestyle be measured? Commonly utilized, also by the EC, is income information for computing poverty. Households or individuals are defined as at risk of poverty if their equivalent disposable income does not exceed 60 percent of the median equivalent disposable income (Eurostat 2012, p. 9). This is a standard indicator of poverty, also applied in popular studies about poverty in Germany such as the Wealth and Poverty Report by the Federal Government[1] (BMGS 2013) and the Poverty Atlas by the Paritätische Association (Schneider et al. 2013). Nevertheless, the single consideration of income information as an indicator for poverty gives a rather vague picture of poverty. For instance, individuals can be considered as at risk of poverty and still may have an acceptable standard of living because the risk of poverty occurs only for a short period of time or can be compensated by other resources such as savings or asset holdings. Hence, accumulated wealth can stabilize the standard of living in low income periods.[2]

Applying income and wealth information to measure poverty mirrors a broader perspective about the real financial situation of a household or an individual. Thus, a correspondent analysis of poverty based on income and wealth is crucial to obtain a picture of economic well-being and thus on poverty of households and individuals. Furthermore, a multidimensional approach helps to gain a deeper insight into the degree of poverty in a society.

Taking into account the usefulness of multidimensional poverty measurement, in this thesis both income and wealth data is utilized to analyze at risk of poverty in Germany. Three waves (2002, 2007 and 2012) of the German Socio-Economic Panel (SOEP) are used to investigate to which degree at risk of poverty varies in socio-economic characteristics. Thus, poverty profiles and their changes over time can be detected. Moreover, the probability of suffering of at risk of poverty is studied.

First, at risk of income poverty and at risk of wealth poverty is analyzed separately. Second, both at risk of income and wealth poverty is studied together. At last, poverty groups are studied: twice-poor, which are households that are at risk of income and wealth poverty; protected-poor, households that are at risk of income poverty but not at risk of wealth poverty; vulnerable-poor, households which are at risk of wealth poverty but not at risk of income poverty; non-poor, households which are neither at risk of income poverty nor at risk of wealth poverty. For robustness checks, 95 percent

[1] The Wealth and Poverty Report is an official report by the German Government, released every four years.

[2] Note wealth assets differ in their liquidity. Hence not all assets can be liquidized.

bootstrap confidence intervals are derived for all results.
The thesis is structured as follows. Section 2 gives an overview of the existing literature. Section 3 describes the used SOEP data. The methodology utilized for estimating the results is described in Section 4. Section 5 demonstrates results of the unidimensional approach and results of the multidimensional approach appear in the following section. In Section 7 findings are critically discussed. Last, Section 8 concludes.

2 Literature

2.1 Literature on Income and Wealth poverty

Measuring poverty is a popular topic in economic literature. However, articles using both income and wealth data for analyzing poverty are rather rare in the literature. Notable exceptions are Ruggles & Williams (1989), Bosch (1998), Brandolini et al. (2010). Those articles apply an annuity method to study income and wealth together. This procedure was initially proposed by Weisbrod & Hansen (1968), who summarizes wealth and income data into a single index of welfare. Household net wealth is converted into a flow of resources and every household which does not have enough wealth to compensate the income poverty gap is considered income and wealth poor. This approach, however, does not allow to determine different poverty groups. Wolff (1990), Bourguignon & Chakravarty (2003) and Azpitarte (2012), for instance, apply another method. They specify a poverty line for each dimension. Thus, different poverty groups can be detected. Wolff (1990) is focusing on twice-poor households over time in the United States. Azpitarte (2012) characterizes four different poverty groups for Spain and the United States. Moreover, Azpitarte (2012) analyses socio-economic characteristics of income and wealth poor households and the probability of being in one of the poverty groups.
In Germany, only few articles cover both, income and wealth poverty. Hauser et al. (2007), for instance, study income and wealth poverty by applying an integrated income and wealth approach, using data from the Income and Expenditure Survey (EVS). They perform a descriptive analysis and estimate at risk of poverty for different socio-economic characteristics based on the integrated distribution for the year 2003. Grabka & Westermeier (2014) study income and wealth poverty in Germany using SOEP data. They estimate at risk of poverty for each dimension and carry out a descriptive analysis. They identify four groups: at risk of both, income and wealth poverty; at risk of income poverty and not at risk of wealth poverty; not at risk of income poverty but at risk of wealth poverty: neither at risk of income nor at risk of wealth poverty. Grabka & Westermeier (2014) look at the percentage of the population belonging to one of these groups. Further, they differentiate the population into seven age groups and look at the share of people in a certain age group belonging to one of the poverty groups.
In my studies, I make use of the latter procedure and the analysis by Azpitarte (2012). My descriptive analysis also focuses on detecting poverty profiles as I study poverty in

Germany based on various socio-economic characteristics and if they have changed over time. Moreover, I go beyond a descriptive analysis. I look at the probability of a household belonging to one of these poverty groups. Furthermore, I analyze if that probability has changed over time. Thus, this thesis contributes to the literature on poverty in Germany in two ways. First, it provides a more complete picture of poverty by studying poverty profiles and their changes over time. Second, it provides details on the probability of belonging to certain poverty group and if that probability has changed in Germany. To my knowledge, there is no paper of that nature in the existing literature. This thesis fills a gap in the literature and promotes multidimensional poverty measurement. Moreover, it gives a broader picture of poverty in Germany and can reveal both offsetting and intensifying trends in Germany.

2.2 Literature Review on Poverty in Germany

Previous research on both income and wealth poverty in Germany is limited. However, there are various articles which explore income and wealth poverty in Germany separately. Goebel & Grabka (2011), for instance, utilize SOEP data for determining the at risk of income poverty rate. They suggest an increase in the rate from the year 2000 to 2010. Noticeably, when focusing on older people the relative poverty risk based on income has remained almost constant even though the number of old-age basic income support has increased in the early 2000s. Bönke & Schröder (2010) apply the German Sample Survey of Income and Expenditure (EVS) data and analyze inter-temporal changes in poverty over time. They decompose their results by region and household types and show that differences in the distribution of characteristics explain more than fifty percent of the poverty divide. Their study implies that single parents with children have the highest poverty risk in terms of income in Germany. Goebel et al. (2015) utilize SOEP data to analyze at risk of income poverty for different household types over time. Furthermore, they apply a logit regression model to investigate the determinants of at risk of income poverty and their marginal effects over time. They suggest that mainly young aged individuals living in single households are affected by at risk of income poverty.

Regarding wealth, Grabka & Westermeier (2015) apply SOEP data and provide details on the development of the amount of wealth in real terms. They compare their findings by consulting EVS data. Their results indicate changes on the upper and lower limits of wealth distribution. More precisely, they observe a lower median and mean wealth in 2012 compared to 2002. Frick, Grabka & Hauser (2010) and Grabka & Westermeier (2014) utilize SOEP data and analyze wealth differences concerning age groups. They suggest that the relative risk of wealth poverty is the highest for young aged individuals. Further, the risk typically decreases during the working life of individuals and increases again when becoming pensioners.

Besides a multidimensional poverty approach, I investigate at risk of income poverty and at risk of wealth poverty separately in my studies. I utilize various socio-economic

characteristics to analyze poverty profiles, their changes over time and the probability of being affected. Thus, this thesis provides a more complete picture of at risk of income poverty and at risk of wealth poverty in Germany.

3 Data

3.1 Income and Wealth Datasets in Germany

This subsection investigates available datasets that cover income and wealth information of private households in Germany in oder to find the best available dataset for analysis based on income and wealth information.
Wealth and income data of private households is ascertained in three surveys in Germany: German Socio-Economic Panel (SOEP), Household Finance and Consumption Survey (HFCS)[3] and the Income and Expenditure Survey (EVS).
The EVS is the oldest survey in Germany. It is conducted on a five year duration by the Federal Statistical Office since 1962/1963 in West Germany and since 1993 in East Germany and covers 60,000 private households (Destatis 2008). However, it is a quota sampling which includes certain population groups only with an insufficient proportion. This suggests a limited representativeness of the dataset for representing the hole population in Germany (Frick, Grabka & Hauser 2010, p. 13). Another issue of concerns is that observations which have a monthly household net income of 18,000 € or higher are excluded. Furthermore, company assets and tangible wealth are not included.
The HFCS surveys micro data in the euro area and is conducted by the Eurosystem[4]. It was first surveyed in the year 2010 and is conducted on a four year duration. Each wave embraces more than 3,500 private households. The HFCS is a representative sample for Germany. Moreover, it is a harmonized survey and allows for international comparability. So far it covers private wealth most extensively in Germany (Kalckreuth et al. 2012).
The SOEP is a longitudinal survey carried out by the German Institute for Economic Research (DIW) in collaboration with the fieldwork organization TNS Infratest Sozialforschung. The survey was started in West Germany in 1984 and extended to East Germany in 1990. It is a representative sample for Germany. The SOEP collects annual data of private households on an individual and household basis; it covers more than 10,000 households and about 23,000 individuals. Income information is surveyed every year, wealth on a five year duration. A variety of areas such as demographic and parental characteristics, labor market, health, personality, subjective wellbeing and political involvement of individuals living in private households are also covered in the SOEP (Frick, Grabka & Hauser 2010, p. 47).

[3]The HFCS is surveyed by the German Federal Bank (Deutsche Bundesbank) and also known as Panel on Household Finances (PHF).
[4]The Eurosystem consists of the national central banks of the European Countries and the European Central Bank.

In comparison, the EVS has the largest sample size, however it is a quota sample and does not consider monthly household net income of 18,000 € and higher. Further, company- and tangible wealth is not included. The HFCS started in 2010, thus it does not allow an analysis over a ten year period. The SOEP has a smaller sample size than the EVS. However, it is a representative sample and in contrast to the HFCS, it allows an analysis over time. Consequently, the SOEP is the best available data base in Germany for income and wealth analysis over time. More precisely, for income and wealth studies on socio-economic characteristics and changes of them over time it is the only available dataset in Germany.
The following subsection provides details on income data of the SOEP used for calculations. Subsection 3.3 covers wealth data.

3.2 Income Information

Income data includes:[5] [6]

- Household labor earnings
- Household asset income
- Household private transfers
- Household public transfers
- Household social security pensions
- Household private retirement income

Income information is surveyed every year retrospectively for the previous calendar year and for the current month. Analysis based on current monthly income information might include seasonal differences. Thus, yearly income data for the previous year is applied. For calculations, total household taxes are subtracted. Thus, household post-government income is applied. Then, the data is adjusted by an imputed rental value to account for differences in housing costs between house owners and tenants. This is a common procedure in international literature (Frick et al. 2007). The resulting disposable income is used for calculations.

3.3 Wealth Information

Since 2002, the SOEP surveys a set of wealth-questionaire on a five-year duration. This covers positive and negative wealth components of all household members older than 16 years of age (Frick & Grabka 2009, p. 56).[7] Up to now wealth data is provided for the years 2002, 2007 and 2012. Gross wealth information includes:

[5] Grabka (2014, p. 42).
[6] For a detailed description see Appendix Table 1.
[7] In comparison to income data, a detailed description of wealth data is not provided as components are self-explanatory, respectively, described in brackets. However, for more detailed information on wealth data see Frick, Grabka & Markus (2010, p. 35 set seq.)

- Owner-occupied property
- Other property (including undeveloped land, holiday or weekend flats)
- Financial wealth (savings, savings bonds or other bonds, shares or investment certificates)
- Private insurances (life or private pension insurances)
- Building loan contracts
- Company assets (ownership of a stake in a firm, business or company)
- Tangible wealth (jewelry, gold, artworks)

Negative wealth information includes:

- Property ownership debts
- Other property ownership debts
- Consumer credits

In this thesis, net-wealth is used which results from the difference between positive and negative wealth.
Note that there have been variations between the survey of 2002 and 2007. In the year 2002, private insurances and building loan contracts have not been gathered separately. A further difference exists with regard to financial wealth. Money assets under 2,500 € are not covered in the year 2002. The first point only leads to differences in precision of wealth whereas the second point leads to an underestimation of wealth. In order to tackle these variations, multiple imputations are applied to ensure comparability between waves (Frick, Grabka & Hauser 2010, p. 50 et. seq.).[8]

3.4 Restrictions of Income and Wealth Data

As described above, the SOEP provides extensive information about the wealth situation of private households. This allows poverty analysis not only based on income data but also on wealth data. However, potential shortcomings need to be considered.
Prospective entitlements to state pension funds and entitlements to company pensions are not taken into account. Tangible wealth data such as vehicles and the entire house contents are not collected. Tangible assets such as jewelry, gold and artworks are included. However, determining an adequate market value is difficult for most participants as they do not have this information themselves. Furthermore, questions about wealth are perceived as sensitive questions by a lot of individuals. Therefore, individuals tend not to answer these questions. This results in a lack of responses. There are two forms of this issue: refusal of the survey (unit non-response) and refusal

[8] For information on the multiple imputation process on wealth data in the SOEP see Frick, Grabka & Markus (2010).

of several questions (item non-response). The proportion of unit non-response in the SOEP is relatively low and does not affect the representativeness of the survey (Frick, Grabka & Hauser 2010, p. 51). The management of item non-response is described in Section 4.10. Another shortcoming is that wealth information of individuals under 17 years of age is not included. However, wealth commanded by children only makes up a very small proportion of the total wealth (Frick & Grabka 2009, p. 58). Regarding those issues, net wealth information provided by the SOEP is slightly underestimated. In addition, a further constraint is an over-representation of households that belong to the middle-class income and wealth range. In comparison to national accounts, very low incomes and high incomes are underrepresented. Hence, a distortion towards the middle class can be assumed. This is a common issue in many income and wealth survey (Frick et al. 2012). Underestimation of income and wealth inequality can be a consequence. In order to reduce this issue the SOEP introduced a partial sample of "high-income households" in 2002. Income and wealth components of high-income earners (top three percent of the income distribution) are represented in more detail. Nonetheless, the very rich households such as billionaires and multi-millionaires are not in the sample set. However, the lack of data for super-rich households in Germany is a common concern of all data sources (Grabka & Westermeier 2014, p. 154 set seq.).

4 Methodological Considerations

4.1 Unit of Analysis and Working Sample

There is no consensus in the literature on whether to use households or individuals as data collection unit. The CanberraGroup (2011, p. 64) for example, suggests income and poverty studies using individuals as unit of analysis. The RioGroup (2006, p. 36) recommends using households for studying poverty.
In this thesis, both units are applied to generate results. Two working samples are utilized for analyzing poverty. In one sample households is the unit of analysis, and individuals in the other.
In the first sample which is the main working sample the unit of analysis is the household, since I am interested in poverty profiles of different household groups. A household is defined as including all individuals living together in the same abode. In household analysis, the equivalent disposable household income is counted once whereas in studies on individual basis, the equivalent disposable household income is surveyed for each household member. In a logit regression, for example, a 10 member household would be included 10 times in the analysis. To avoid this problem, the household head is used as a representative for a given household. Estimates are based on three waves: 2002, 2007 and 2012. The sample size for 2002 is 12,365, for 2007 it is 11,406 and for 2012 it is 10,598. Poverty profiles are studied by applying descriptive analysis and logit regressions. Different socio-economic characteristics are considered

such as age, sex, region, household size, household type, labor status and education of the household head and own property.[9] Furthermore, poverty groups are identified. Those groups are compared using descriptive analysis and logit regression.
The second sample is utilized for descriptive analysis on individuals. As commonly applied in the literature and suggested by the CanberraGroup (2011, p. 64), the unit of analysis is individuals. Note that results for individuals and households slightly differ as in household analysis the equivalent disposable household income, for instance, is counted once whereas in the analysis on individual basis the equivalent disposable household income is surveyed for every household member. Further, different frequency weights are applied. Analysis on individuals provide an overview of income and poverty for the whole population in Germany. The years from 2002 to 2012 are studied and about 25.000 individuals are covered each year. Furthermore, for an overview of wealth in Germany, the distribution of wealth and at risk of wealth poverty is studied. The results are based on the same sample excluding individuals under 17 years of age.[10] For wealth analysis, solely years 2002, 2007 and 2012 are studied as wealth is surveyed on a five year duration since 2002.
In terms of population weighting, for analysis on individuals, individual frequency weights are applied and on households, household frequency weights respectively. The data is weighted according to the population structure at the time of data collection. For instance, data presented here for the year 2012 illustrates the population structure of 2012 using population weights of 2012 and income information of 2011. Note that annual income is surveyed retrospectively for the previous calendar year. Wealth information is surveyed for the current year.

4.2 Equivalence Scale

Equivalence scales are applied as they account for differences in size and composition of the household. Furthermore, they take economics of scale into account that arise when living together. It is argued that all household members pool and share available resources (i.e., income). Hence, individuals with no income, for instance, benefit from income of other household members. Thus, equivalence scales make households or individuals comparable with each other. This is as standard procedure and generally accepted in poverty research (Atkinson 1987, CanberraGroup 2011, RioGroup 2006). However, there is no accepted method for determining equivalence scales. In this thesis, the modified OECD equivalence scale is applied on income and wealth data.[11] It is the most common equivalence scale and thus it enable comparisons with previous findings of other authors. It was proposed by Hagenaars et al. (1994) and weights the first adult in a household by 1.0, each additional person in the household of age 15 or older by 0.5, and each child aged 14 or younger by 0.3. Suppose a couple and a child living in

[9] For a detailed description of the socio-economic categories see Table 2.
[10] Individuals under 17 are not covered in the SOEP wealth survey based on individuals.
[11] Note, there is no specified equivalence scale recommended by the OECD (Cf. `http://www.oecd.org/eco/growth/OECD-Note-EquivalenceScales.pdf` [last downloaded 2015-10-31]).

one abode and have a total disposable income of 3,000 €. The equivalent disposable household income would be about 1,666 € (= $4,000/(1 * 1 + 1 * 0.5 + 1 * 0.3)$). Hence, each of them have a standard of living that is equal to that of a single person with a net income of 1,666 €.
The OECD suggests to apply the same equivalence scale on wealth data that is applied on income data for analysis that jointly studies income and wealth (OECD 2013, p. 169). Thus, the modified equivalence scale is also utilized for wealth information.
It should to be considered that relative poverty is sensitive to the equivalence scale and the poverty line used for calculations (Buhmann et al. 1988, Burkhauser et al. 1996, Vos & Zaidi 1997). For instance, a higher weight on an extra adult or child leads to a lower equivalent income per person in a given household. Burkhauser et al. (1996), for example, focus on relative economic well-being using official equivalence scales and consumption-based equivalence scales. Their results indicate no sensitivity to the equivalence scale used when measuring overall inequality and poverty levels. Notwithstanding, in terms of relative income and poverty levels of subgroups of the population, the official German equivalence scale[12] yields different results from those using other scales. Thus, the results may be sensitive to the equivalence scale applied.

4.3 Price Adjustment

All results presented are price adjusted. This allows a comparative analysis over time. Price adjustments account for differences caused by inflation. Thus, real prices enhance the presentation of the actual economic situation of an individual or household. The general consumer price index published by the German Federal Statistical Office is applied on income and wealth data with base year 2010. Besides, one drawback is that one price index is utilized for the whole country as there might be regional differences. However, so far there are no official region-specific price levels published, thus the general consumer price index is applied.
Note that research on wealth development in Germany is typically based on nominal values (Grabka & Westermeier 2014, BMGS 2013, Frick, Grabka & Hauser 2010). However, price adjusted wealth is estimated under the same considerations as discussed above. In Germany, there is no wealth specific price index, hence the consumer price index is applied.

4.4 Head-Count Ratio

The head-count ratio (HCR) is the percentage of people that have, for instance, an equivalent income which does not exceed the poverty line. The HCR is defined as follows:

[12]The official German equivalence scale is based on the Income and Consumption Survey.

$$P_H = \frac{1}{N}\sum_{i=1}^{N}(x_i < z)\cdot 1 = \frac{1}{N}\sum_{i=1}^{N}1(x_i < z) \quad (1)$$

The poverty line is a given threshold z. First, individuals who are below that threshold are summed up. Second, the number of the poor is divided by the size of the population N. Therefore P_H represents the share of individuals or households that fall below the poverty line relative to the overall population. Using income as an example, the at risk of income poverty rate is computed. The threshold is 60 percent of the median equivalent income (Atkinson & Marlier 2010, p. 104). This is a widely accepted procedure for estimating at risk of income poverty which is recommended by the European Statistical Office. The median equivalent income is the amount that divides the income distribution into two equal groups. One half of individuals or households have an equivalent income which is above the median equivalent income and the other half have an equivalent income which is below. Individuals or households which have a income lower than 50 percent of the median equivalent income are considered as relative income poor.

The HCR is easy to interpret and suitable for comparing results. Results remain unchanged if income, for example, of all households grow at same rate. Thus, a better income situation for low income households relative to high income households leads to a decrease in poverty estimates.

4.5 Unidimensional Poverty Measurement

4.5.1 Measuring Poverty Based on Income Information

Disposable equivalent price adjusted income (henceforth "equivalent income") is utilized for estimating income poverty.

The sum of disposable income by all family members during the previous year is calculated. Using that information, the equivalent disposable income is generated. To achieve equalization, the modified OECD equivalence scale is applied. The equivalent income is price adjusted for every year, 2002 to 2012 using the year 2010 as base year. Weights are applied according to the population structure.

As discussed, a household or individual is considered as being at risk of income poor if the equivalent income is less than 60 percent of the median equivalent income.

Moreover, for incomes that do not exceed the poverty line, the mean poverty gap is generated. This is the mean of the difference between the poverty line and the actual equivalent disposable income of all incomes below the poverty line. In contrast to the HCR, which provides information about the incidence of poverty, the mean poverty gap provides information about the intensity of poverty.

4.5.2 Functions of Wealth

Income is one factor that contributes to an acceptable standard of living, another factor is wealth. The accumulation of people's individual net wealth can improve their opportunities for self-realization and their standard of living. In microeconomic terms wealth has various functions (Hauser et al. 2007, p.135):

- Income function (e.g. investments can lead to additional income)
- Utilization function (e.g. own property can improve personal freedom)
- Security function (stabilize consumption during a period of a lack of income)
- Power function (greater wealth can give more political or economic power)
- Social mobility or status preservation function (attain or keep high status of living)
- Socialization function (e.g wealth can play an important role in raising and educating children)
- Bequeathing function (e.g. providing security in old age; intergenerational transfer)

Especially the security and the bequeathing function are crucial when looking at poverty. In times of income loss, wealth can stabilize the standard of living and therefore those affected can avoid slipping below the poverty threshold. Another example is own property, which can prevent slipping into poverty when retiring.
In general, wealth is accumulated over the lifetime of an individual. At the beginning of the working age most individuals have little or no wealth. During working age, wealth increases whereas it decreases in age of retirement (Ando & Modigliani 1963). Thus, wealth follows an inverse U-shape pattern during a life cycle of an individual.

4.5.3 Measuring Poverty Based on Wealth Information

Contrary to relative at risk of income poverty, there exists no standard definition of relative at risk of wealth poverty. In this thesis, a definition suggested by Frick, Grabka & Hauser (2010, p.124) is used which is basically analogue to the determination of at risk of income poverty. A household or individual is considered as being at risk of wealth poverty if the price adjusted equivalent net wealth (henceforth "net wealth") is less than 60 percent of the median net wealth. For equalization, the modified OECD equivalence scale is utilized. Net wealth is price adjusted, 2010 is the base year. To avoid outliers, wealth data is top-coded at a 99.9 percentile. This is a common procedure for estimating wealth in Germany (Frick, Grabka & Hauser 2010, Grabka & Westermeier 2015). Frequency weights are applied according to the population structure.

4.6 Multidimensional Poverty Measurement

4.6.1 Indicators for Multidimensional Poverty Measurement

According to the EC, individuals and families are defined as poor if they are excluded from the minimum acceptable lifestyle in terms of material, social and cultural means in the country they are living in. To measure this, they apply disposable equivalent income information. Utilizing disposable equivalent income data for measuring poverty is widely accepted in poverty research. Nevertheless, only considering income data as an indicator for poverty mirrors a somewhat vague picture of poverty. As discussed earlier, individuals can be considered as income poor and may have an acceptable standard of living because income poverty occurs only for a short period of time or can be compensated by other resources such as savings or asset holdings. Accumulated wealth can stabilize the standard of living in low income periods. Furthermore, analyzing both income and wealth data provides more information about the economic status of an individual or a household. More precisely, a picture of economic well-being and the vulnerability regarding to shocks can be gathered. However, multidimensional poverty measurement based on income and wealth data gives no information about the degree of individual needs. Concerning poverty, individual needs can be estimated in terms of resources such as education, social capital or health. Those immaterial indicators can also be considered when measuring poverty. Further indicators of poverty are material deprivation indicators such as: coping with unexpected expenses, one week annual holiday away from home, keeping home adequately warm, a washing machine. In general, deprivation indicators are applied for measuring poverty in terms of social exclusion (Eurostat 2012, p. 9).
In this thesis, the vulnerability of a minimum acceptable lifestyle is estimated. Further, poverty measurement is focused on economic well-being in terms of material well-being. Thus, indicators for individual needs are not considered. Furthermore, the latter indicators are not included for estimating poverty as deprivation indicators are considered for measuring absolute poverty. As a result, wealth and income information is considered for measuring multidimensional poverty.

4.6.2 Measuring Poverty Based on Income and Wealth Information

The literature suggests two approaches for measuring at risk of both, income and wealth poverty. In the first approach, a household is identified as being income and wealth poor if neither equivalent income nor net wealth does exceed the 60 percent median threshold. Thus, income and wealth poverty is specified for each dimension (Wolff 1990, Bourguignon & Chakravarty 2003, Azpitarte 2012). In the second approach, both variables are aggregated to one indicator. The annuity method is applied to study income and wealth together. This procedure was proposed by Weisbrod & Hansen (1968). The index is defined as the sum of current income plus the lifetime annuity of its net worth. Every household whose annuity from wealth is not enough to compensate

the income-poverty gap, is identified as poor (Brandolini et al. 2010, Bosch 1998). In this method, wealth holdings are only considered for households that are below a certain income poverty line. Therefore, different poverty groups such as people that are at risk of income poverty and not at risk of wealth poverty can not be identified.
Thus, results presented here are generated by using the first approach. This method allows to analyze at risk of income and wealth poverty and to differentiate between poverty groups. Four groups are identified: twice-poor, households that are at risk of both income and wealth poverty; protected-poor, households that are at risk of income poverty but not at risk of wealth poverty; vulnerable-poor, households which are at risk of wealth poverty but not at risk of income poverty; non-poor, households which are either at risk of income poverty nor at risk of wealth poverty.

4.7 Logit Model

For analyzing the determinants of being at risk of poverty empirically, a logit model is applied. The logit regression is based on the following equation:

$$y_{it} = \beta_t + \sum_{j=1}^{J} \beta_{jt} \cdot x_{j,i,t} + e_{it} \tag{2}$$

y_{it} is an indicator variable which is equal to one if a certain household is identified as belonging to a determined group, and zero otherwise. i is the surveyed household. t is the observed year. β displays the logit coefficients. $x_{j,i,t}$ are categorical variables of observation i, year t and for the independent variable j. Explanatory variables are age, sex, region, marital status, household size, squared household size, household type, labor status and education of the household head.[13] The reference group is a household with a working male head with medium education level between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children. Furthermore, the reference group for analyzing poverty groups is a household that does not belong to the observed group with the latter profile. e_{it} is an error term.
I decided to apply a logit regression for each year to analyze effects at different points of time.[14]
For robustness checks, 95 percent bootstrap confidence intervals are calculated for all estimates.[15] In addition, standard errors are displayed.

4.8 Bootstrap Procedure

To test statistical significance of the results, I compute confidence intervals using the bootstrap method. This method was introduced by Efron (1982) and is asymptotically

[13] For further details on categories of the socio-economic characteristics applied see Table 2 and on education see Section 9.3.
[14] To check the sensitivity of the results all regressions are conducted including a year indicator variable. The reference year is 2002. Results are available upon request.
[15] The bootstrap procedure is further described in Subsection 4.8.

more accurate than the standard intervals obtained using sample variance and assumptions of normality (DiCiccio & Efron 1996, p. 189).
In general, the original population is unknown and the sample population is an excerpt of the original population. As the population is unknown, the true error term in a sample statistic against the population cannot be identified. Still, inference can be conducted using the bootstrap procedure. In the following, the bootstrap procedure applied with unequal weight is described. This is suggested by Biewen (2002).
The function F of the original sample is unknown. Thus, the variance of a statistic $\hat{S}$, such as the mean income, is not known. From bootstrap statistics S_b, the variability of the statistic $\hat{S}$ of the original sample data can be assessed. B bootstrap samples of n observations are taken from the original sample using sampling with replacement.[16] Sampling with replacement provides a virtually zero probability that the bootstrap sample will be identical to the original sample. In the bootstrap procedure the original sampling procedure is applied to every bootstrap sample. For instance, for every bootstrap sample the mean income is derived (S_b). This process is repeated a large number of times.

$$\hat{F} \rightarrow \{(y_1^b, w_1^b), (y_2^b, w_2^b), ..., (y_n^b, w_n^b)\} \quad for\ b = 1, 2, ..., B. \tag{3}$$

The formula demonstrates bootstrap samples of n observations using income and weight variables (y_n^b, w_n^b). The weighted estimate of the statistic of interest, in this example the mean income, is estimated for each sample. This process leads to a bootstrap distribution for the weighted estimator $S(\hat{F})$. Furthermore, confidence intervals (henceforth "CI") can be estimated. There are two types of CI which can be applied. First, a symmetric CI which is a normal approximation CI. Second, an asymmetric CI which is a percentile CI. The percentile CI is preferred when the distribution is skewed as it provides a better coverage for those distributions (Efron & Tibshirani 1994, p. 171 et seq.).
In this work, I draw B=200 random samples with replacement for each year. Thus, bootstrap poverty measures are computed for each sample in each cross section. 200 bootstrap weights with the same number of units as in the original sample are generated, $(w_1^b, w_2^b, ..., w_n^b)$. Those follow a uniform distribution. Every bootstrap weight is divided by the mean of the bootstrap sample weight of each cross section. For estimating a bootstrap statistic, e.g. mean income, the sample weight is multiplied by the bootstrap weight. The bootstrap mean income is generated by following the original sampling procedure and applying those weights to each bootstrap sample. Further, from the ordered 200 bootstrap indices, an asymmetric $(1 - \alpha)$ CI is derived:

$$[c_{(\alpha/2)}(S_b); c_{(1-\alpha/2)}(S_b)] \quad for\ b = 1, 2, ..., B \tag{4}$$

$c_{(\alpha/2)}$ and $c_{(1-\alpha/2)}$ are the percentiles of (S_b), for $b = 1, 2, ..., B$. Bootstrap CI are computed at a 95 percent level, 2.5th upper and lower percentile. An asymmetric CI is applied

[16] Sampling with replacement allows that an observation can be included in the bootstrap sample several times.

as income and wealth distributions are more likely to be left-skewed (Bronfenbrenner 1971, p. 58). Thus, in general, $\hat{S}$ will not lie at the midpoint of $c_{(\alpha/2)}$ and $c_{(1-\alpha/2)}$.

4.9 Pearson Correlation

In Subsection 6.1, the relationship between income and wealth is studied. To analyze the relation between income and wealth, the Pearson correlation coefficient is applied. The Pearson correlation coefficient, sometimes also called population correlation coefficient, measures the strength of the linear relationship between two variables. Note, a linear relationship between two variables is presumed. Otherwise a correct representation of the strength of the correlation between two variables can not be ensured. The following formula is utilized for calculations (Wooldridge 2012, p. 733):

$$\hat{\rho} = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^{n} (y_i - \bar{y})^2}} = \frac{Cov(X, Y)}{s_x s_y} \tag{5}$$

The covariance is divided by the product of the standard deviations of the two variables. The coefficient can range from -1 to 1. 0 indicates no linear correlation, -1 total negative and 1 total positive correlation between two variables.

4.10 Dealing with Missings and Inconsistency

The quality of the data may be reduced due to incorrect responses. Inconsistencies emerge through divergent information by the interviewed person. For example, individuals who live in one household give different responses regarding the wealth amount of owner occupied property. Those inconsistencies are scanned by different mechanisms and corrected through editing (Frick, Grabka & Markus 2010, p. 3).
A further issue is item non-response. Wealth questions were first surveyed in the year 2002. In 2002, about twenty percent of the participants did not respond to questions concerning monetary assets. Main reasons for a refusal are sensitivity of the subject and not having this kind of information themselves.The proportion of missings shrunk for all wealth assets to about ten percent from year 2002 to 2007. In the second wealth survey, in 2007, participants already knew the wealth questionnaire and could investigate the amount of certain wealth titles beforehand (Frick, Grabka & Markus 2010, p. 208). However, item non-response is an issue, thus removing all participants with item non-response would lead to a strong decline of the data. Beyond that, biased results could be another consequence as item non-response could be correlated to socio-economic characteristics of the participants (Frick, Grabka & Markus 2010, p. 1). Multiple imputations are applied to deal with item non-response. For example, wealth information from year 2002 is utilized to correct wealth data in year 2007 and vice versa (Frick, Grabka & Markus 2010, p. 10). As mentioned earlier, monetary wealth below

2,500 € is not covered in 2002. Nevertheless, monetary wealth information is surveyed in 2007 and multiple imputations are utilized to retroactively adjust monetary wealth for 2002 (Frick, Grabka & Markus 2010, p. 50).
For generating multiple imputations, various regressions are performed. In terms of wealth, for every wealth title, five variations are executed. Those variations differ in their assumption of the distribution of the residuals. In this thesis, the unweighted mean using all five imputations is generated for every wealth title. This procedure is further explained and also applied in the work of Böwing-Schmalenbrock & Jurczok (2012). Note that multiple regressions lead to a decrease in disparity, residual decrease and a convergence to mean. To tackle this issues, Heckman-corrected models are used to add random residuals.[17]

5 Unidimensional Analysis of Poverty

5.1 Relative Income poverty

Table 3 demonstrates the mean and median equivalent monthly income, the poverty line at a 60 percent threshold and the mean poverty gap at this threshold for individuals for the years 2002, 2007 and 2012.

[Table 3 about here]

Table 3 reveals that all estimates have significantly increased during the observed period. Mean income has increased by about 5 percent in ten years since 2002; 1,799 € to 1,883 €. Furthermore, median income and poverty line have increased by about 2 percent from year 2002 to 2012: median income from 1,596 € to 1,630 €; poverty line from 957 € to 978 €. The mean poverty gap has increased by 3.8 percent from the year 2002 to 2012. This suggests a relatively higher mean income among individuals who suffer from the at risk of income poverty and thus a slightly better income situation for them in contrast to the year 2002.
Graph 1 illustrates the at risk of income poverty rate and relative income poverty for individuals living in private households in Germany.

[Graph 1 about here]

Both ratios increased markedly. From 2002 to 2005 the at risk of income poverty rate has increased by 1.5 percentage points (which is an increase by about 12 percent) and stagnates at around 14 percent since then. However, during 2009 and 2010 the index increased slightly but shrunk in the following years. Relative income poverty increased by approximately one percentage point. Therefore, the distance between both measures increased. As a result, in the year 2012 the amount of individuals being at risk of income

[17] For a detailed description see Frick, Grabka & Markus (2010, p. 10).

poverty but not suffering of income poverty increased. The 95 percent bootstrap CI suggests little variation within the HCRs.
Graph 2 provides details on regional differences in Germany over time. Relative at risk of income poverty rates for East and West Germany are displayed.

[Graph 2 about here]

Rates clearly differ; more than 15 percent in East Germany and less than 12 percent in West Germany are affected by at risk of income poverty in year 2002. After 2003, the rate bluntly increased in East Germany to more than 20 percent in year 2006. It slightly decreased in 2007, however, rose again in the following year. In 2012, the at risk of income poverty rate is at nearly 22 percent in East Germany. In West Germany the rate has gently increased to about 14 percent in year 2010. In the following year, it shrunk. In 2012, it is slightly above 12 percent.
Thus, Graph 2 suggests that at risk of income poverty increased in East and West Germany. Noticeably, in East Germany it rose more sharply. Thereby, the distance between both rates increased. In addition, the 95 percent bootstrap CIs indicate a wide variation in East Germany and relative little variation in West Germany. This is mainly caused by the smaller number of observations in East Germany.

5.2 At Risk of Income Poverty

Table 4 demonstrates to which degree at risk of income poverty of households varies in socio-economic characteristics over time. Furthermore, the proportion in the population for each category within a group is calculated. Additionally, the ratio between the incidence of at risk of income poverty among groups and the overall incidence is estimated.

[Table 4 about here]

Among all age categories, those under 25 years face the highest rate of at risk of income poverty: 2002, 47.0; 2007, 50.7; 2012, 50.6. Besides, this age group accounts for the smallest share in the population, about 3.4 percent. Further, the rate is shrinking with an increasing age, reaching its lowest point at an age between 45 and 55 (2002, 10.6; 2007, 13.7; 2012, 11.4) and rises again with an increasing age. Interestingly, the risk of being income poor is noticeably larger for households in East Germany: 2012, 13.1 percent in West Germany; 22.3 in East Germany. Indeed, the distance of the rates even increased over time. When analyzing household types, lone parents and singles face the highest risk: 31.1 and 22.5 percent in 2012. Particularly noteworthy is that the risk of income poverty rate markedly increased for households whose head is out of work, from 42.4 percent in 2002 to 61.8 percent in 2012. In 2012, the incidence of at risk of income poverty for that group is by the factor 4.1 higher than the overall risk of being income poor.

To recapitulate, young headed households from East Germany, female, never married, lone parent, unemployed, low educated are especially vulnerable to at risk of income poverty.
In addition, to analyze the effect that different socio-economic characteristics have on the probability of that risk, Table 5 presents the estimated results of a logistic regression.

[Table 5 about here]

The coefficients in Table 5 confirm most of the descriptive results. Households with heads under 25 years have a relatively higher probability of at risk of income poverty. The same holds for households that live in East Germany. The coefficients for this group even increased over time. In contrast to relatively high at risk of income poverty rates for female headed households, most of the regarding logit coefficients are not significantly positive. Further, never married and divorced household heads face a greater risk of at risk of income poverty, contrary to widowed household heads. Their probability is distinctly negative, coefficients are significant at the one percent level. Similar to the descriptive analysis, single and lone parent households are more exposed to at risk of income poverty compared to other household types. Besides, the extent of the coefficients decreased over time. Moreover, unemployment and low education have a significant positive effect on the incidence of at risk of income poverty. The difference between the coefficients of low and high educated households increased from 2002 to 2012. Interestingly, retired household heads face a clear positive risk, significant at the one percent level.
Hence above all, young age, region East Germany, single, lone parent, unemployment and low education are factors that condition the probability of at risk of income poverty.

5.3 Relative Wealth Poverty

Table 6 illustrates the mean and median net wealth, the poverty line at a 60 percent threshold and the at risk of wealth poverty rate for individuals for the years 2002, 2007 and 2012.

[Table 6 about here]

Mean wealth rose slightly from the year 2002 to 2007 and shrunk again in 2012: 100,094 €, 103,723 €, 95,082 €. At the same time, median wealth decreased from the year 2002 to 2007 and slightly increased again in 2012: 39,503 €, 35,806 €, 36,290 €. In fact, there is a significant gap between the mean and the median net wealth. In addition, the poverty line lies at 23,702 € in 2002 and 21,774 € in 2012. In contrast to at risk of income poverty, at risk of wealth poverty rates are markedly higher: 44.0 percent in 2002, 43.1 in 2007 and 43.5 in 2012. Coherent with the analysis of at risk of income poverty, there is a clear disparity in West and East Germany. Table 7

demonstrates the wealth distribution for West and East Germany in 2002, 2007 and 2012.

[Table 7 about here]

Mean and median wealth and thus the poverty line decreased in both regions. In the year 2002, the amount of median wealth was 111,912 €, 49,097 € respectively and in 2012, 106,997 € and 47,522 € in West and East Germany. Further, for each dimension, the difference between both regions did not decrease in that time period. In both regions, at risk of wealth poverty remains at a high level: West Germany, 41.6; 40.7 percent in 2002 and 2012; in East Germany 54.6 percent in both years. All results lie in the 95 percent bootstrap CI.

5.4 At Risk of Wealth Poverty

Table 8 presents the incidence of at risk of wealth poverty of households by socio-economic characteristics over time. Moreover, the ratio between the incidence of at risk of wealth poverty among categories and the overall incidence is estimated.

[Table 8 about here]

As expected, at risk of wealth poverty is most overrepresented among household heads at the beginning of their life cycle. With an increasing age, the rate decreases and reaches it lowest point at an age between 56 and 65 years and rises again afterwards. Interestingly, the at risk of wealth poverty rate for the age group over 75 decreased from 47.5 percent in 2002 to 41.5 percent in 2012. Female headed households face a higher at risk of wealth poverty risk in contrast to male headed households. Likewise the at risk of wealth poverty rate on individuals for East and West Germany (cf. Table 7), the at risk of wealth poverty rate clearly differs in East and West Germany. Also, the distance of the rate between both regions did not shrink over the research period: 41.4, 55.5 in 2002; 40.8, 55.7 in 2007 and 40.5, 57.0 in West and East Germany in the year 2012. Coherent with at risk of income poverty, single and lone parent households have a markedly higher at risk of wealth poverty rate compared to other household types. Besides, single households have, with more than one third, the highest share among household types. When considering unemployment, the ratio between at risk of wealth poverty among that group and the overall incidence is 1.6 in 2002, 1.8 in 2007 and 1.9 in 2012. Further, the rate increased significantly over that time period, from 71.0 percent in 2002 to 82.7 percent in 2012. As expected, property owners face low at risk of wealth poverty rates (3.5, 4.7, and 5.1 percent), whereas non-property owners have large rates (72.9, 71.7 and 76.7 percent).
In addition, Table 9 illustrates the results of a logit model for the probability of at risk of wealth poverty and confirms most of the descriptive results in Table 8.

[Table 9 about here]

Similar to the probability of at risk of income poverty, young age, region East Germany, single, lone parent, unemployment, retirement and low education are factors that are contingent upon the probability of at risk of wealth poverty. Young households have high positive coefficients whereas old households have negative coefficients on the probability of at risk of wealth poverty. Further, the effects are clearly larger for young households compared to the coefficients of at risk of income poverty. The same holds for households from East Germany. When considering sex, positive coefficients are only significant in the year 2012. Moreover, single and lone parent households have larger coefficients regarding at risk of income poverty compared to their estimates of at risk of wealth poverty. Never married and divorced households face a positive probability of at risk of wealth poverty, coefficients are significant at the one percent level and even increase over the period of time. Concerning at risk of income poverty estimates for those categories, not all coefficients present significant positive results.

6 Multidimensional Analysis of Poverty

6.1 Relationship between Income and Wealth

In this section, it is analyzed if using both income and wealth is more informative with respect to unidimensional approach. An association between wealth and income can be verified by examining their correlation. If income and wealth data would be perfectly correlated or almost perfectly correlated, a simultaneous consideration would not lead to a more informative analysis with respect to a unidimensional approach.
Table 10 illustrates the correlation coefficients between income and wealth for year 2002, 2007 and 2012. The Pearson correlation coefficient is applied for computations.

[Table 10 about here]

As expected, Table 10 suggests a positive correlation between income and wealth. Particularly a close link between disposable income and net wealth and gross wealth (net wealth plus debts) is observed. Both estimates are about 0.48 during 2002 and 2012. The link between income and own property is not as strong as to net wealth, however also suggests a positive association: 0.37 in 2002 and 2012. Further, coefficient of income and other property and financial wealth suggest also a positive correlation. As a result, a positive association between income an wealth can be confirmed. Furthermore, the correlation coefficients are far off from being 1. Therefore, a multidimensional poverty approach will provide additional information on households' risk of being poor and their living situation.
In order to check for robustness of the results, Spearman coefficients were estimated

and confirm a positive correlation of all estimates at a one percent level.[18]

6.2 At Risk of Income and Wealth Poverty

Table 11 reports the relative incidence of at risk of income and wealth poverty for households by socio-economic characteristics over time. In addition, the proportion in the population for each category within a group is calculated. Also, the ratio between the incidence of at risk of income poverty among groups and the overall incidence is estimated.

[Table 11 about here]

In 2002, 11.7; in 2007, 12.7 and in 2012, 12.2 percent faced at risk of both, income and wealth poverty. Those rates are in average 2.5 percentage points lower than the rates for at risk of income poverty. Thus, most of the households which suffer from at risk of income poverty, also suffer from at risk of wealth poverty. The incidence of at risk of income and wealth poverty is markedly decreasing with an increasing age and rises again for the over 66. Interestingly, married household heads exhibit relatively low rates (5.0, 6.2 and 5.7 percent), compared to never married household heads (20.5, 20.6, 19.8 percent). The same for couples with children and lone parents: 7.4, 7.0, 7.9 compared to 30.7, 33.4, 27.5 percent. Further, at risk of income and wealth poverty significantly increased for unemployed household heads, from 38.1 in 2002 to 54.1 percent in 2012. The ratio for the incidence of the unemployed group and the overall incidence is 4.3. Moreover, at risk of income and wealth poverty rates for the low educated group are twice of that for household heads with medium education. Property owners have rates which are close to zero whereas no property owners have rates about 20 percent.
In addition to the descriptive analysis, Table 12 presents the effect that different socio-economic characteristics have on the probability of being at risk of both, income and wealth poverty.

[Table 12 about here]

Table 12 verify most of the descriptive results. Young households with heads under 25 years face a greater relative risk of income and wealth poverty. Those coefficients even increased over time. Similar to previous regressions, region, the type of living arrangement, labor status and education highly conditions the chances of being in at risk of income and wealth poverty. Indeed, there is a positive effect for households living in East Germany, singles, lone parents, unemployment, retirement and low education. Besides, those coefficients are significant at the one percent level for all years. Further, the effect on the probability of at risk of income and wealth poverty even increased for low educated household heads over time. At the same time, the negative effect on that probability for high educated household heads increased.

[18] Spearman coefficients were calculated to check for consistency, estimates are available upon request.

6.3 Poverty Groups

6.3.1 Analysis of Poverty Groups

In this subsection, four different poverty groups are identified using income and wealth information of private households: Twice-poor, protected-poor, vulnerable-poor and non-poor.
Twice-poor households are at risk of both income and wealth poverty and already analyzed in the latter section. Protected-poor, are households that are at risk of income poverty but not at risk of wealth poverty. Vulnerable-poor households are at risk of wealth poverty but not at risk of income poverty and non-poor households are either at risk of income poverty nor at risk of wealth poverty.
Table 13 demonstrates the share of households belonging to a certain group for the years 2002, 2007 and 2012.

[Table 13 about here]

In 2012, 12.5 percent belong to the twice-poor group. The share of the protected-poor, in contrast, is markedly smaller. This group constitutes 2.6 percent of all households. Nearly one third of households are vulnerable-poor and more than half of the population are considered as non-poor. Noticeably, there are no significant distributional changes of the groups over time.
In addition, Table 14 goes beyond the latter analysis and illustrates to what proportion at risk of poverty of those groups varies in socio-economic characteristics and over time.

[Table 14 about here]

The share of protected-poor households is relatively low for all categories. For instance, households with a head under 25 years, only 0.7 percent are considered as being protected-poor, in contrast, 44.5 percent are vulnerable and 46.3 percent are twice-poor in year 2012. The share of protected-poor households increases with age, whereas the share of vulnerable and twice-poor decreases with age and increases again for those households aged 66 years and older. The proportion of non-poor females is about ten percentage points smaller compared to the amount of non-poor males (in 2012 46.8 and 58.8). In the analysis by regions, the share of vulnerable and twice poor households is clearly larger in East Germany. Besides, the proportion of non-poor households did neither increase in West Germany nor in East Germany over time. In fact, the proportion of non-poor households slightly decreased in East Germany, from 42.5 in 2002 to 40.1 percent in 2012. When looking at household types, the share of vulnerable-poor singles decreased about 3 percentage points to 35.5 percent in year 2012. Further, the proportion of non-poor singles increased slightly from 40.3 to 42.0 percent. When examining labor status, unemployed household heads account for the

smallest population share. Though, they are the most affected ones, only 24.8 percent belong to the non-poor group in 2002. The share even decreased to 9.6 percent in year 2012. Further, the amount of protected-poor households increased from 4.2 to 7.7 during the research period. There are no major changes when comparing education categories. Households with a high educated household head have a relatively high share of the non-poor group, 70.9 percent in 2012. In contrast, the share of the non-poor medium educated is 51.3 percent in 2012, and for low educated household heads 34.8 percent. The low educated have a large proportion of twice-poor households which even increased about 4 percentage points to 26.8 from 2002 to 2012. The last group in Table 14 is property owner. As expected, there are substantial differences between own property and no own property. Households that have own property are barely affected from at risk of poverty, more than 90 percent belong to the non-poor group. In contrast, households that do not have own property, only 25 percent are considered being non-poor.
In addition, to study the effect that socio-economic characteristics have on the probability of belonging to the different groups, Table 15 reports the estimates of a multinomial logit model for the year 2002. Table 16 and 17 illustrate estimates for 2007 and 2012.

[Table 15, 16, 17 about here]

Coherent with the descriptive results, the U-shaped age pattern concerning at risk of poverty rates cannot be confirmed for all groups. No significant results are provided by the protected-poor for each age category and year. Mainly, because of the considerable low proportion which belongs to that group. For twice- and vulnerable-poor households, it can be verified that households under 35 face the largest relative risk of being included to a certain group and middle aged households face the lowest risk. However, significant results for an increasing risk for households who are above 65 cannot be confirmed. Those households that are at risk of income but not at risk of wealth poverty even suggest a significant negative probability for year 2012. When considering sex, similar to previous regressions, the sex of the household head does not matter. Only the vulnerable-poor group suggests a positive probability for year 2002 and 2012, significant at the ten percent level. Furthermore, region, the type of living arrangement, labor status and education highly condition the chances of being twice-poor in the observed period. The incidence of protected-poor, in contrast, has positive coefficients for the single household type and unemployment. Interestingly vulnerable-poor suggest negative coefficients for unemployment, for all years. Considering education, all groups illustrate significant negative estimates for high educated household heads.

7 Discussion

7.1 Interpretation of the Results

In this section, similar outcomes in both uni- and multidimensional poverty analysis are brought together. In the following subsection, findings are discussed in the context of existing literature in this field.

In both uni- and multidimensional poverty analysis young age, region East Germany, single, lone parent, unemployment, retirement and low education are factors that condition at risk of poverty[19].

It is observed that households with a head under 36 years of age are particularly vulnerable to at risk of poverty. Young adults, until 25, are usually in vocational training or in higher education. Hence, those are likely not employed or only part-time employed. As a consequence, they have a low disposable income and no accumulated wealth and thus a higher poverty risk. Young household heads between 25 and 35 are at an early stage of their employment career, thus earnings are rather low and little or no wealth can be accumulated. Consequently, this may lead to a higher poverty risk of that age group. Moreover, when analyzing age groups, all descriptive results imply an U-shape pattern of at risk of poverty. This is consistent with early work by Ando & Modigliani (1963) where the amount of income and wealth follows an inverse U-shape pattern during a life cycle. The logit coefficients, however, cannot confirm all of these findings.

Moreover, results indicate large differences of at risk of poverty between East and West Germany. These are mainly due to historical circumstances and the lower economic development in East Germany. Although, one would expect that those differences are decreasing over time, results suggest the contrary. A widening gap between East and West Germany is ascertained. Furthermore, the share of twice and vulnerable-poor households living in East Germany has significantly increased. Interestingly, unemployment rates are decreasing in East Germany since 2009 whereas registered employment has increased from 2009 to 2013 (cf. IAB 2015). One reason for this development could be that mainly households which were not affected by at risk of poverty have benefited from the improving economic situation in East Germany.

Across all household types, at risk of poverty rates are the highest for lone parents. During 2002 and 2012, most findings indicate little improvement for the situation of lone parents. In fact, at risk of wealth poverty rates for lone parents have even increased. One plausible reason is that raising children demands a considerable amount of parental time, obliging parents, in particular lone parents to work less hours or to stay at home. Further, children may create an additional poverty risk as they rise household needs but not the household's earnings capability. This additional poverty risk may not concern couples with children but lone parents. Couples with children can

[19] At risk of poverty describes in this chapter common results for all estimates of at risk of income poverty, at risk of wealth poverty, at risk of income and wealth poverty and poverty groups with an exception to the non-poor group.

easier compensate additional costs compared to lone parents as they are more likely to have a higher disposable household income. Indeed, couple households with children are not forthwith more affected by at risk of poverty compared to couple households. Moreover, findings indicate that also single households have a relatively high poverty risk. They are particularly affected by the risk of wealth poverty. One reason might be that single and lone parent households have relatively higher costs compared to other living arrangements. Couple households, for instance, profit from economics of scale as they share cost of living. Thus, they can easier accumulate wealth. Results clearly suggest that couple households are on average less affected by at risk poverty.
As expected, results regarding unemployment indicate that households with an unemployed household head face a high poverty risk. Interestingly, all findings suggest that the share of at risk of poverty increased for that group over time. Consequently, descriptive results of the share of twice and vulnerable-poor households have increased during the observed period. In contrast, the share of non-poor households with an unemployed head has significantly decreased. Those shifts could be due to changes in the unemployment insurance act at the beginning of the observed time period. The relatively low share of households that have accumulated wealth suggests that a considerable high amount of household heads are long-term unemployed or worked in a low-paid employment before. Thus, only little or no wealth could have been accumulated by them. Moreover, it also implies that those affected are more likely to live in an one-earner household. In addition, results regarding the labor status indicate that being employed does not mean being protected against poverty. Probably, mainly employed household heads which are working in a low-paid sector or work part-time are affected by at risk of poverty. Furthermore, the household constellation plays an important role. A household with a non-working head and another household member who is employed, is rather protected from at risk of poverty compared to a not working and lone parent household.
Moreover, outcomes indicate that education has a reducing effect regarding at risk of poverty. Thus, households with a low educated head have a particularly high poverty risk. Further, most findings suggest that at risk of poverty has increased for low educated household heads whereas it has decreased for high educated household heads during the observed time period. This implies that education plays an increasingly important role to reduce at risk of poverty in society.

7.2 Main Results in Context of Previous Literature

The main results are consistent with the findings of previous research on at risk of income poverty and at risk of wealth poverty in Germany discussed in Section 4.4. Goebel et al. (2015), for instance, utilize SOEP data and study at risk of income poverty on individuals. They suggest an increase of the median income and the at risk of income poverty rates are similar to those in Figure 1. Further, their outcomes indicate that particularly young individuals who live alone are affected by at risk of income

poverty. Those rates even increased during 2002 and 2012. Moreover, at risk of income poverty has increased in households where members are employed until 2012.
Regarding wealth, Grabka & Westermeier (2015) utilize SOEP data and estimate the distribution of price adjusted wealth over time. They suggest that mean wealth has decreased from 2002 to 2012. In a previous publication by them, results indicate that at risk of income and wealth poverty decreases with increasing age from 55 to 65, after that it increases again (Grabka & Westermeier 2014). They use SOEP data but apply a different equivalence scale for analyzing wealth. Individual household net wealth per capita is estimated. In fact, absolute mean and median wealth is lower compared to my results, but the estimated poverty rates are similar.

8 Conclusion

Most research regarding poverty applies income information to measure relative poverty in developed countries. However, only utilizing income data to estimate poverty could lead to an incomplete picture. For instance, a household can be considered poor even if a household member owns real estate or equity.
In order to obtain a more complete picture of poverty, a multidimensional approach is applied in this thesis. Income and wealth information from three waves (2002, 2007 and 2012) of the SOEP are utilized for estimating poverty in Germany over time. First, at risk of income poverty and at risk of wealth poverty is studied separately. Second, households that are both at risk of income and wealth poverty are analyzed. To measure this, a poverty line for each dimension is specified. Households are identified as at risk of income and wealth poverty if their income and wealth amount does not exceed the corresponding poverty line. This method allows me to identify four poverty groups: twice-poor which are households that are at risk of income and wealth poverty; protected-poor, households that are at risk of income poverty but not at risk of wealth poverty; vulnerable-poor, households which are at risk of wealth poverty but not at risk of income poverty; non-poor, households which are neither at risk of income poverty nor at risk of wealth poverty.
The at risk of poverty rates are utilized to investigate to which degree a certain rate differs in socio-economic characteristics. In fact, poverty profiles and their changes over time are analyzed for each rate. Further, a logit regression model is applied for each dimension and each wave to estimate the effect that various socio-economic characteristics have on the probability of the at risk of poverty rates and if those effects have changed during the observed period of time. For robustness checks, 95 percent bootstrap confidence intervals are calculated for all results.
My findings suggest that young age, region East Germany, single, lone parent, unemployment and low education are factors that condition the at risk of poverty rates. Indeed, the definition of a certain rate influences the percentage of households that are affected by at risk of poverty, however, has a limited effect on the poverty profiles. Interestingly, poverty profiles have not changed over time but some factors have

intensified. All outcomes regarding unemployment and low education suggest a significant increase of at risk of poverty during 2002 and 2012. Further, descriptive results show that the risk of poverty rates have increased for households with an employed household head. Thus, being employed does not necessarily protect from at risk of poverty. Regarding poverty groups, results indicate that there are no significant distributional changes of the four groups over time. However, results imply significant distributional changes when considering various categories. Consistent with latter outcomes, the share of non-poor households with an unemployed and/or low educated head has decreased over time.

I think that my results provide a deeper insight into poverty analysis in Germany as it considers income and wealth data to study poverty profiles and their changes over time. To my knowledge, there has not been such kind of study in Germany yet. Therefore, this thesis contributes to the existing literature in this field.

Additional research of that nature could shed more light on the topic at hand. Concerning findings regarding the labor status, a more detailed analysis on the employment status, for instance, categories such as civil servants, employee, self-employed would be interesting for further research. Moreover, one group which has not be taking into account separately are migrants. Thus, considering current world affairs future research on migration and poverty would be of emerging policy relevance.

Moreover, analysis on poverty is of great political importance. A successful poverty-reduction strategy by a government requires knowledge about the factors that conditions poverty in a country and if the extent of a certain factor has changed over time. Thus, findings presented here are crucial for policy implications.

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9 Appendix

9.1 Income Information

Table 1: Income Description

	Description[20]
Household labour earnings	wages and salary from all employment including training, self-employment income, bonuses, overtime, and profitsharing
Household asset income	income from interest, dividends, and rent
Household private transfers	payments from individuals outside of the household including alimony and child support payments
Household public transfers	housing allowances, child benefits, subsistence assistance from the Social Welfare Authority, special circumstances benefits from the Social Welfare Authority, government student assistance, maternity benefits, unemployment benefits, unemployment assistance, and unemployment subsistence allowance
Household social security pensions	payments from old age, disability, and widowhood pension schemes
Household private retirement income	private retirement income
Total household taxes	income taxes and payroll taxes (health, unemployment, retirement insurance, and nursing home insurance taxes[21])

[20] For more details on income data of the SOEP see Grabka (2014).

[21] Given tax burdens are based on updated and modified tax calculation routines. For detailed information see Schwarze (1995).

9.2 Socio-economic Characteristics

Table 2: Socio-economic Characteristics

	Category	Reference category
Characteristics of the household head		
Age	≤25; 26-35; 36-45; 56-65; 66-75; >75	36-45
Gender	male; female	male
Region	West Germany; East Germany	West Germany
Marital status	married; never married; divorced; widowed	married
Labour status	working; unemployed; retired; other inactive	working
Education degree[22]	low; medium high	medium
Property Owner	yes; no	yes
Characteristics of the household		
Household type	single; lone parent; couple, with children[23]; couple, childless; other combination	couple, childless
Household size	1-13 household members	one covariate

[22] A more detailed description in Section 9.3.
[23] Children are considered every household member under 16 years of age.

9.3 Education Coding

Education of the household head is coded as follows:[24]

- **Low** includes intermediate secondary school (Realschule), lower secondary school (Hauptschule), other and none.
- **Medium** includes upper secondary school degree giving access to university studies (Abitur), certificate of aptitude for specialized short-course higher education (Fachhochschulreife), apprenticeship (Lehre) and specialized vocational school (Berufsfachschule).
- **High** includes school of health care (Schule des Gesundheitswesens), High School Specialized college of higher education, post-secondary technical school (Fachhochschule), College, technical university usually requiring practical training as part of the studies (Technische Universität) and civil service training.

9.4 Income Poverty

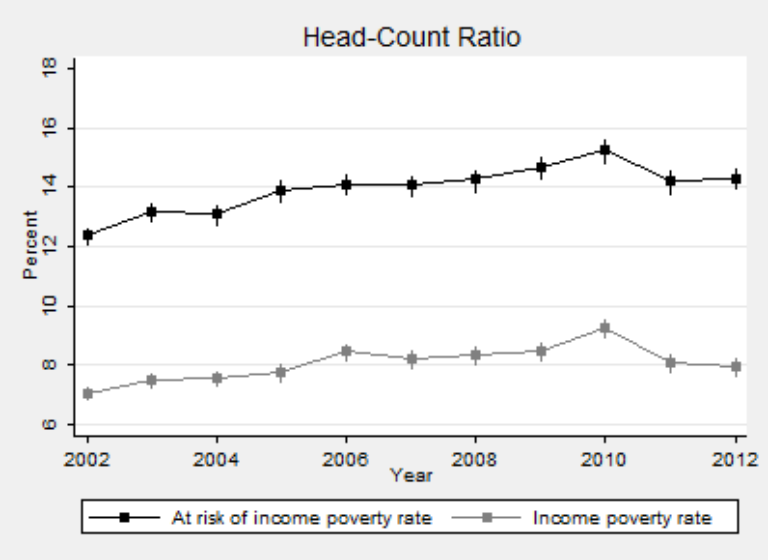
Table 3: Income and Poverty Distribution

	2002	2007	2012
Individuals			
Mean Income	1,779	1,831	1,883
	[1,771;1,788]	[1,819;1,843]	[1,868;1,897]
Median Income	1,596	1,593	1,630
	[1,589;1,603]	[1,580;1,600]	[1,622;1,645]
Poverty line[25]	957	956	978
	[953;962]	[948;960]	[973;987]
Mean poverty gap	733	727	761
	[728;738]	[721;731]	[756;766]

Note. Year is survey year. Pooled income information is used and based on previous year's income. Individuals living in private household are analyzed at 2010 prices. In parentheses, 95 percent bootstrap confidence intervals.
Database is SOEP v30. Own calculations.

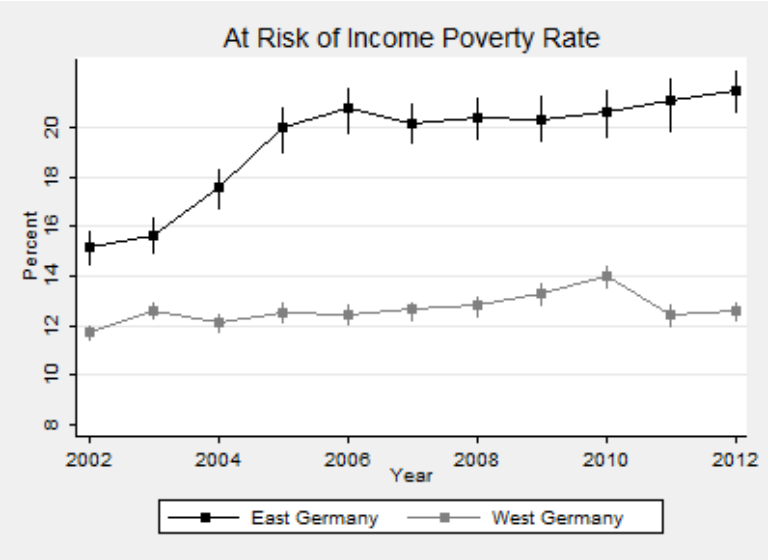
[24] Variable description by the SOEP is used. For more details see Grabka (2014).
[25] 60 percent of the price adjusted median equivalent disposable household-income.

Figure 1: Head-Count Ratio



Note. Year is survey year. Pooled income information is used and based on previous year's income. Individuals living in private household are analyzed at 2010 prices. Vertical bars indicate 95 percent bootstrap confidence intervals.
Database is SOEP v30. Own calculations.

Figure 2: At Risk of Income Poverty Rate in West- and East Germany



Note. Year is survey year. Pooled income information is used and based on previous year's income. Individuals living in private household are analyzed at 2010 prices. Vertical bars indicate 95 percent bootstrap confidence intervals.
Database is SOEP v30. Own calculations.

Table 4: Socio-economic Characteristics of at Risk of Income Poor Households.

(Pop and Poor in percentage)

		2002			2007				2012			
		Pop	Poor	R.R[26]	**Pop**	Poor	R.R	02/07	**Pop**	Poor	R.R	07/12
	All	100	14.2	1	100	15.5	1	1.3	100	15.1	1	-0.4
Age	<25	3.4	47.0	3.3	3.5	50.7	3.3	3.7	2.9	50.6	3.4	0.0
	26-35	16.0	15.3	1.1	12.3	17.8	1.1	2.5	10.3	18.6	1.2	0.8
	36-45	21.3	11.5	0.8	20.8	13.2	0.9	1.7	15.3	12.4	0.8	-0.9
	46-55	16.1	10.6	0.8	17.3	13.7	0.9	3.1	21.4	11.4	0.8	-2.3
	56-65	17.1	12.2	0.9	15.6	14.4	0.9	2.2	17.8	16.2	1.1	1.8
	66-75	14.2	13.0	0.9	17.7	13.9	0.9	0.8	18.1	13.2	0.9	-0.7
	>75	11.8	17.1	1.2	12.7	13.6	0.9	-3.5	14.1	15.1	1.0	1.5
Sex	Male	59.0	10.4	0.7	55.3	12.2	0.8	1.7	54.0	12.8	0.8	0.7
	Female	41.0	19.6	1.4	44.7	19.7	1.3	0.1	46.0	17.8	1.2	-1.9
Region	West Germany	81.0	13.0	0.9	79.4	13.7	0.9	0.6	78.3	13.1	0.9	-0.5
	East Germany	19.0	19.2	1.4	20.6	22.8	1.5	3.6	21.7	22.3	1.5	-0.4
Marital Status	Married	48.4	7.2	0.5	45.1	8.4	0.5	1.2	45.6	7.7	0.5	-0.6
	Never Married	24.7	22.2	1.6	26.0	23.8	1.5	1.6	25.0	22.5	1.5	-1.2
	Divorced	12.1	24.9	1.8	14.4	27.0	1.7	2.1	15.2	27.5	1.8	0.6
	Widowed	14.8	15.1	1.1	14.6	11.7	0.8	-3.4	14.2	12.3	0.8	0.6
Household Type	Single	37.5	21.0	1.5	39.5	21.6	1.4	0.7	40.7	22.5	1.5	0.9
	Lone Parent	6.1	32.9	2.3	6.1	36.1	2.3	3.2	5.1	31.1	2.1	-5.0
	Couple, with children	16.1	8.2	0.6	13.5	7.9	0.5	-0.3	12.0	9.0	0.6	1.1
	Couple, childless	28.8	7.3	0.5	29.3	8.0	0.5	0.8	31.2	7.3	0.5	-0.7
	Other combination	11.5	7.9	0.6	11.5	11.8	0.8	3.9	11.0	9.0	0.6	-2.8
Labour Status	Working	55.2	8.2	0.6	54.1	8.9	0.6	0.8	54.7	8.9	0.6	0.0
	Unemployed	5.2	42.4	3.0	5.2	58.1	3.7	15.6	4.3	61.8	4.1	3.7
	Retired	24.7	15.1	1.1	28.1	13.9	0.9	-1.1	29.4	14.7	1.0	0.8
	Other inactive	14.8	25.2	1.8	12.6	29.8	1.9	4.6	11.5	28.0	1.9	-1.8
Education	Low	17.5	27.3	1.9	17.0	29.7	1.9	2.4	16.0	31.0	2.1	1.2
	Medium	61.9	13.1	0.9	61.3	15.2	1.0	2.1	60.4	14.8	1.0	-0.4
	High	20.6	6.2	0.4	21.7	5.3	0.3	-0.9	23.6	5.1	0.3	-0.2
Property Owner	Yes	41.6	4.6	0.3	41.7	5.0	0.3	0.4	45.5	5.0	0.3	0.0
	No	58.4	21.0	1.5	58.3	23.0	1.5	2.0	54.5	23.6	1.6	0.5

Note. Year is survey year. Pooled income information is used and based on previous year's income. Household head living in private household is analyzed at 2010 prices. 95 percent bootstrap confidence intervals are estimated and available upon request.
Database is SOEP v30. Own calculations.

[26] R.R. indicates the relative risk for each category, defined as the ratio between the incidence of poverty among the group and the overall incidence.

Table 5: Logit Regression on the Probability of at Risk of Income Poor Households

	2002		2007		2012	
Constant	-5.317***	0.40	-4.241***	0.38	-3.622***	0.50
	[-6.105;-4.529]		[-4.982;-3.501]		[-4.592;-2.653]	
Age; Sex Region						
<25	1.631***	0.15	1.642***	0.15	1.802***	0.16
	[1.341;1.921]		[1.344;1.940]		[1.488;2.116]	
26-35	0.297**	0.11	0.435***	0.11	0.512***	0.14
	[0.074;0.520]		[0.225;0.646]		[0.234;0.791]	
46-55	-0.11	0.13	-0.10	0.11	-0.16	0.11
	[-0.357;0.133]		[-0.309;0.109]		[-0.378;0.063]	
56-65	-0.11	0.15	-0.398**	0.14	0.02	0.13
	[-0.406;0.186]		[-0.664;-0.132]		[-0.240;0.275]	
66-75	-0.10	0.33	-0.31	0.26	-0.34	0.27
	[-0.758;0.549]		[-0.822;0.212]		[-0.868;0.188]	
>75	0.07	0.34	-0.30	0.31	-0.33	0.27
	[-0.587;0.734]		[-0.909;0.315]		[-0.862;0.212]	
Female	-0.03	0.08	0.00	0.08	0.12	0.07
	[-0.178;0.119]		[-0.162;0.155]		[-0.026;0.257]	
East Germany	0.391***	0.08	0.498***	0.07	0.633***	0.07
	[0.241;0.542]		[0.358;0.639]		[0.492;0.775]	
Marital Status						
Never Married	0.292*	0.14	0.11	0.15	0.284*	0.13
	[0.027;0.557]		[-0.182;0.394]		[0.036;0.533]	
Divorced	0.393**	0.14	0.24	0.15	0.421**	0.14
	[0.122;0.665]		[-0.063;0.541]		[0.154;0.688]	
Widowed	-1.090***	0.16	-1.335***	0.19	-1.248***	0.18
	[-1.404;-0.776]		[-1.697;-0.972]		[-1.592;-0.904]	
Household Type						
Size	0.781***	0.23	0.41	0.22	-0.13	0.29
	[0.332;1.229]		[-0.018;0.829]		[-0.689;0.439]	
Size²	-0.04	0.02	-0.02	0.02	0.06	0.03
	[-0.088;0.008]		[-0.067;0.026]		[-0.007;0.120]	
Single	2.116***	0.21	1.804***	0.20	1.398***	0.24
	[1.703;2.528]		[1.414;2.193]		[0.927;1.870]	
Lone Parent	1.789***	0.17	1.697***	0.18	1.519***	0.20
	[1.450;2.127]		[1.347;2.047]		[1.136;1.901]	
Couple; with children	-0.572**	0.22	-0.644**	0.22	0.12	0.22
	[-1.007;-0.138]		[-1.073;-0.215]		[-0.320;0.557]	
Other combination	-0.747***	0.22	-0.14	0.20	-0.07	0.21
	[-1.167;-0.326]		[-0.525;0.250]		[-0.476;0.335]	
Labout Status and Education						
Unemployed	2.255***	0.11	2.502***	0.13	2.499***	0.14
	[2.046;2.464]		[2.252;2.751]		[2.233;2.765]	
Retired	1.287***	0.32	1.147***	0.26	1.282***	0.26
	[0.663;1.912]		[0.631;1.662]		[0.771;1.793]	
Other inactive	1.630***	0.10	1.656***	0.09	1.372***	0.10
	[1.439;1.821]		[1.471;1.842]		[1.168;1.577]	
Low	0.894***	0.08	0.871***	0.08	0.991***	0.09
	[0.742;1.046]		[0.710;1.031]		[0.816;1.166]	
High	-0.915***	0.12	-1.085***	0.11	-1.004***	0.10
	[-1.146;-0.684]		[-1.308;-0.862]		[-1.192;-0.816]	
Sample	12,365		11,406		10,598	
Pseudo R^2	0.25		0.26		0.25	

Note. The reference household is a non-poor household with a male head between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children, and were the head is working, with medium educational level. Year is survey year. Pooled equivalent household income information is used and based on previous year's income. Household head living in private household is analyzed at 2010 prices. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. In parentheses, 95 percent bootstrap confidence interval. In order to check the robustness of the results a logit regression including a year indicator variable using the year 2002 as reference variable is conducted. Results can be confirmed and are available upon request.
Database is SOEP v30. Own calculations.

9.5 Wealth Poverty

Table 6: Wealth and Poverty Distribution

	2002	2007	2012
Individuals			
Mean Wealth	100,094	103,723	95,082
	[98,191;101,637]	[101,544;106,463]	[93.107;97.061]
Median Wealth	39,503	35,806	36,290
	[38,111;40,757]	[33,985;36,590]	[35,159;38,292]
Poverty line[27]	23,702	21,483	21,774
	[22,867;24,454]	[20,391;21,954]	[21,095;22,975]
At risk of wealth poverty	44.0	43.1	43.5
	[43.6;44.5]	[42.4;43.7]	[42.9;44.1]

Note. Year is survey year. Pooled equivalent household wealth information is used and based on current year's wealth. Individuals aged 17 and older living in private household are analyzed at 2010 prices. Wealth top-coding at 99.9 percentile. In parentheses, 95 percent bootstrap confidence intervals.
Database is SOEP v30. Own calculations.

[27] 60 percent of the price adjusted median equivalent household wealth.

Table 7: Wealth Distribution in West- and East Germany

	2002		2007		2012	
	West	East	West	East	West	East
Individuals						
Mean Wealth	111,912	49,097	119,101	43,826	106,997	47,522
	[109,756;113,749]	[47,381;50,664]	[116,710;121,692]	[42,338;45,216]	[104,592;109,291]	[45,233;49,545]
Median Wealth	48,371	16,465	45,234	15,734	45,817	16,010
	[46,275;51,196]	[16,608;18,738]	[43,908;47,582]	[15,002;17,014]	[43,437;48,031]	[15,296;17,125]
Poverty line[28]						
	29,021	10,591	27,140	9,440	27,490	9,606
	[27,765;30,712]	[9,965;11,243]	[26,345;28,549]	[9,001;10,209]	[26,061;28,818]	[9,178;10,275]
At risk of	41.6	54.6	40.3	54.1	40.7	54.6
wealth poverty	[41.0;42.1]	[53.6;55.5]	[39.6;41.0]	[53.1;55.1]	[40.0;41.4]	[53.4;55.6]

Note. Year is survey year. Pooled equivalent household wealth information is used and based on current year's wealth.
Individuals aged 17 and older living in private household are analyzed at 2010 prices.
Wealth top-coding at 99.9 percentile. In parentheses, 95 percent bootstrap confidence intervals.
Database is SOEP v30. Own calculations.

[28] 60 percent of the price adjusted median equivalent household wealth.

Table 8: Socio-economic Characteristics of at Risk of Wealth Poor Households.

(Pop and Poor in percentage)

		2002			2007				2012			
		Pop	Poor	R.R[29]	**Pop**	Poor	R.R	02/07	**Pop**	Poor	R.R	07/12
	All	100	44.7	1	100	43.8	1	-0.9	100	44.1	1	0.3
Age	<25	3.4	90.8	2.1	3.5	88.4	2.0	-2.4	2.9	93.3	2.1	4.9
	26-35	16.0	63.2	1.4	12.3	61.1	1.4	-2.1	10.3	69.6	1.6	8.5
	36-45	21.3	44.3	1.0	20.8	47.8	1.1	3.6	15.4	47.9	1.1	0.0
	46-55	16.1	35.4	0.8	17.3	38.1	0.9	2.7	21.4	40.8	0.9	2.7
	56-65	17.0	30.3	0.7	15.6	31.1	0.7	0.8	17.8	36.0	0.8	4.9
	66-75	14.2	34.6	0.8	17.7	36.1	0.8	1.5	18.1	32.5	0.7	-3.6
	>75	11.9	47.5	1.1	12.7	42.6	1.0	-4.9	14.1	41.5	0.9	-1.2
Sex	Male	59.0	37.7	0.9	55.3	37.9	0.9	0.2	54.0	38.8	0.9	0.9
	Female	41.0	53.2	1.2	44.7	51.2	1.2	-2.0	46.0	50.4	1.1	-0.8
Region	West Germany	81.0	41.4	0.9	79.4	40.8	0.9	-0.6	78.3	40.5	0.9	-0.2
	East Germany	19.0	55.5	1.3	20.6	55.7	1.3	0.2	21.7	57.0	1.3	1.3
Marital Status	Married	48.4	30.3	0.7	45.0	30.2	0.7	0.0	45.5	29.9	0.7	-0.3
	Never Married	24.7	61.1	1.4	26.0	57.8	1.3	-3.3	25.0	61.4	1.4	3.6
	Divorced	12.1	62.1	1.4	14.4	61.3	1.4	-0.8	15.2	60.1	1.4	-1.2
	Widowed	14.8	46.0	1.0	14.6	43.8	1.0	-2.2	14.2	42.2	1.0	-1.6
Household Type	Single	37.6	56.5	1.3	39.5	54.6	1.2	-1.9	40.7	54.4	1.2	-0.1
	Lone Parent	6.1	67.0	1.5	6.1	69.9	1.6	2.9	5.1	70.0	1.6	0.1
	Couple, with children	25.9	36.4	0.8	23.7	37.4	0.9	1.0	21.9	36.4	0.8	-1.0
	Couple, childless	28.8	30.5	0.7	29.3	29.5	0.7	-1.1	31.2	32.1	0.7	2.7
	Other combination	1.6	34.2	0.8	1.3	36.1	0.8	1.9	1.1	35.6	0.8	-0.5
Labour Status	Working	55.2	41.6	0.9	54.1	41.3	0.9	-0.3	54.7	42.9	1.0	1.6
	Unemployed	5.2	71.0	1.6	5.2	80.4	1.8	9.3	4.3	82.7	1.9	2.3
	Retired	24.8	41.7	0.9	28.1	39.3	0.9	-2.4	29.4	37.3	0.8	-1.9
	Other inactive	14.8	48.0	1.1	12.6	49.9	1.1	2.0	11.5	52.7	1.2	2.8
Education	Low	17.5	59.7	1.4	17.0	62.8	1.4	3.1	16.0	61.1	1.4	-1.7
	Medium	61.9	44.1	1.0	61.3	44.6	1.0	0.5	60.4	46.0	1.0	1.4
	High	20.5	30.6	0.7	21.7	26.6	0.6	-3.9	23.6	27.6	0.6	1.0
Property Owner	Yes	41.6	3.5	0.1	41.7	4.7	0.1	1.2	45.5	5.1	0.1	0.4
	No	58.4	72.9	1.7	58.3	71.7	1.6	-1.2	54.5	76.6	1.7	4.9

Note. Year is survey year. Pooled wealth information is used and based on current year's wealth. Household head living in private household is analyzed at 2010 prices. 95 percent bootstrap confidence intervals are estimated and available upon request.
Database is SOEP v30. Own calculations.

[29] R.R. indicates the relative risk for each category, defined as the ratio between the incidence of poverty among the group and the overall incidence.

Table 9: Logit Regression on the Probability of at Risk of Wealth Poor Households

	2002	SE	2007	SE	2012	SE
Constant	-0.932**	0.30	-0.891**	0.30	-0.10	0.33
	[-1.512;-0.352]		[-1.474;-0.308]		[-0.738;0.542]	
Age; Sex Region						
<25	2.082***	0.17	1.583***	0.14	2.159***	0.25
	[1.755;2.410]		[1.307;1.859]		[1.679;2.640]	
26-35	0.801***	0.07	0.822***	0.07	0.923***	0.09
	[0.662;0.941]		[0.681;0.962]		[0.748;1.098]	
46-55	-0.513***	0.07	-0.579***	0.06	-0.559***	0.07
	[-0.642;-0.384]		[-0.697;-0.462]		[-0.703;-0.416]	
56-65	-0.873***	0.08	-0.885***	0.08	-0.976***	0.09
	[-1.028;-0.718]		[-1.048;-0.722]		[-1.150;-0.802]	
66-75	-1.185***	0.18	-0.743***	0.16	-1.041***	0.16
	[-1.542;-0.828]		[-1.049;-0.436]		[-1.344;-0.737]	
>75	-0.927***	0.20	-0.513**	0.18	-0.746***	0.17
	[-1.320;-0.533]		[-0.863;-0.163]		[-1.084;-0.409]	
Female	0.05	0.05	0.01	0.05	0.141**	0.05
	[-0.037;0.143]		[-0.091;0.104]		[0.035;0.246]	
East Germany	0.549***	0.05	0.598***	0.05	0.694***	0.05
	[0.456;0.643]		[0.494;0.701]		[0.595;0.793]	
Marital Status						
Never Married	0.343***	0.09	0.334***	0.08	0.501***	0.09
	[0.173;0.514]		[0.173;0.496]		[0.318;0.683]	
Divorced	0.690***	0.09	0.713***	0.09	0.914***	0.10
	[0.516;0.864]		[0.535;0.890]		[0.727;1.101]	
Widowed	-0.279**	0.10	-0.233*	0.10	-0.14	0.11
	[-0.483;-0.075]		[-0.430;-0.036]		[-0.366;0.080]	
Household Type						
Size	-0.08	0.18	-0.08	0.19	-0.440*	0.20
	[-0.421;0.268]		[-0.442;0.281]		[-0.839;-0.042]	
Size²	0.02	0.02	0.01	0.02	0.0547*	0.02
	[-0.024;0.054]		[-0.029;0.057]		[0.007;0.102]	
Single	0.752***	0.14	0.747***	0.13	0.22	0.16
	[0.475;1.029]		[0.489;1.004]		[-0.095;0.537]	
Lone Parent	0.932***	0.12	1.043***	0.13	0.770***	0.12
	[0.691;1.173]		[0.790;1.296]		[0.538;1.002]	
Couple; with children	0.03	0.13	0.06	0.13	0.10	0.13
	[-0.218;0.272]		[-0.186;0.305]		[-0.152;0.353]	
Other combination	-0.25	0.18	-0.35	0.22	-0.28	0.21
	[-0.602;0.101]		[-0.784;0.085]		[-0.683;0.124]	
Labout Status and Education						
Unemployed	1.165***	0.10	1.526***	0.11	1.647***	0.15
	[0.965;1.364]		[1.308;1.744]		[1.352;1.942]	
Retired	1.015***	0.18	0.405**	0.15	0.484**	0.15
	[0.670;1.360]		[0.110;0.701]		[0.193;0.776]	
Other inactive	0.619***	0.07	0.464***	0.07	0.553***	0.08
	[0.482;0.756]		[0.324;0.603]		[0.393;0.713]	
Low	0.877***	0.06	0.848***	0.07	0.782***	0.07
	[0.759;0.995]		[0.720;0.976]		[0.651;0.912]	
High	-0.743***	0.05	-0.815***	0.05	-0.745***	0.05
	[-0.845;-0.640]		[-0.912;-0.717]		[-0.843;-0.646]	
Sample	12,365		11,406		10,598	
Pseudo R^2	0.18		0.18		0.19	

Note. The reference household is household with a male head between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children, and were the head is working, with medium educational level. Year is survey year. Pooled household wealth information is used and based on current year's wealth. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. SE denotes the standard error. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. In parentheses, 95 percent bootstrap confidence interval. In order to check the robustness of the results a logit regression including a year indicator variable using the year 2002 as reference variable is conducted. Results can be confirmed and are available upon request.
Database is SOEP v30. Own calculations.

9.6 Income and Wealth Poverty

Table 10: Correlation Coefficients between Income and Wealth

	2002	2007	2012
Household			
Income – Net-wealth	0.48	0.49	0.47
Income – Own-property	0.37	0.36	0.37
Income – Other property	0.37	0.42	0.31
Income – Financial Wealth	0.39	0.39	0.37
Income – Gross-wealth	0.48	0.49	0.47

Note. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Household head living in private household is analyzed at 2010 prices. Wealth top-coding at 99.9 percentile. Pearson correlation coefficient used for calculations. All results are significant at an one percent level. To check consistency, Spearman coefficients are estimated and confirm the results.
Database is SOEP v30. Own calculations.

Table 11: Socio-economic Characteristics of at Risk of Income and Wealth Poor Households.

(Pop and Poor in percentage)

		2002			2007				2012			
		Pop	Poor	R.R[30]	**Pop**	Poor	R.R	02/07	**Pop**	Poor	R.R	07/12
	All	100	11.7	1	100	12.7	1	1.0	100	12.5	1	-0.2
Age	<25	3.4	46.3	3.9	3.5	48.8	3.8	2.5	2.9	49.7	4.0	1.0
	26-35	16.0	14.5	1.2	12.3	15.8	1.2	1.3	10.3	16.7	1.3	0.9
	36-45	21.3	10.2	0.9	20.8	11.6	0.9	1.4	15.4	10.8	0.9	-0.8
	46-55	16.1	8.6	0.7	17.3	12.0	0.9	3.4	21.4	9.1	0.7	-2.9
	56-65	17.0	8.7	0.7	15.6	11.2	0.9	2.5	17.8	13.2	1.1	2.0
	66-75	14.2	9.0	0.8	17.7	9.4	0.7	0.4	18.1	9.5	0.8	0.2
	>75	11.9	12.6	1.1	12.7	9.2	0.7	-3.4	14.1	11.5	0.9	2.4
Sex	Male	59.0	8.3	0.7	55.3	9.7	0.8	1.4	54.0	10.4	0.8	0.8
	Female	41.0	16.7	1.4	44.7	16.5	1.3	-0.2	46.0	14.9	1.2	-1.6
Region	West Germany	81.0	10.5	0.9	79.4	10.9	0.9	0.5	78.3	10.6	0.8	-0.4
	East Germany	19.0	17.1	1.5	20.6	19.6	1.5	2.4	21.7	19.3	1.5	-0.2
Marital Status	Married	48.4	5.0	0.4	45.0	6.2	0.5	1.2	45.5	5.7	0.5	-0.5
	Never Married	24.7	20.5	1.7	26.0	20.6	1.6	0.1	25.0	19.8	1.6	-0.7
	Divorced	12.1	21.5	1.8	14.4	23.8	1.9	2.2	15.2	23.8	1.9	0.0
	Widowed	14.8	11.1	0.9	14.6	8.0	0.6	-3.1	14.2	9.1	0.7	1.1
Household Type	Single	37.6	17.7	1.5	39.5	17.7	1.4	-0.1	40.7	18.9	1.5	1.2
	Lone Parent	6.1	30.7	2.6	6.1	33.4	2.6	2.7	5.1	27.5	2.2	-5.9
	Couple, with children	16.1	7.4	0.6	13.5	7.0	0.6	-0.3	12.0	7.9	0.6	0.9
	Couple, childless	28.8	4.9	0.4	29.3	5.4	0.4	0.6	31.2	5.2	0.4	-0.2
	Other combination	11.5	5.3	0.4	11.5	9.9	0.8	4.6	11.0	7.1	0.6	-2.8
Labour Status	Working	55.2	7.2	0.6	54.1	7.7	0.6	0.5	54.7	7.8	0.6	0.1
	Unemployed	5.2	38.1	3.2	5.2	53.6	4.2	15.5	4.3	54.1	4.3	0.5
	Retired	24.8	10.9	0.9	28.1	9.6	0.8	-1.3	29.4	11.0	0.9	1.4
	Other inactive	14.8	20.9	1.8	12.6	24.5	1.9	3.6	11.5	23.1	1.9	-1.4
Education	Low	17.5	22.6	1.9	17.0	24.5	1.9	1.8	16.0	26.8	2.1	2.3
	Medium	61.9	10.8	0.9	61.3	12.5	1.0	1.7	60.4	12.1	1.0	-0.4
	High	20.5	5.3	0.4	21.7	4.2	0.3	-1.1	23.6	3.7	0.3	-0.5
Property Owner	Yes	41.6	0.2	0.0	41.7	0.3	0.0	0.1	45.5	0.5	0.0	0.2
	No	58.4	19.9	1.7	58.3	21.6	1.7	1.7	54.5	22.5	1.8	0.9

Note. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. 95 percent bootstrap confidence intervals are estimated and available upon request.
Database is SOEP v30. Own calculations.

[30] R.R. indicates the relative risk for each category, defined as the ratio between the incidence of poverty among the group and the overall incidence.

Table 12: Logit Regression on the Probability of at Risk of Income and Wealth Poor Households

	2002	SE	2007	SE	2012	SE
Constant	-5.710***	0.39	-4.469***	0.39	-3.756***	0.49
	[-6.481;-4.940]		[-5.237;-3.702]		[-4.724;-2.788]	
Age; Sex Region						
<25	1.746***	0.15	1.782***	0.16	1.956***	0.17
	[1.459;2.034]		[1.465;2.100]		[1.631;2.280]	
26-35	0.381**	0.12	0.523***	0.13	0.597***	0.14
	[0.148;0.614]		[0.274;0.771]		[0.333;0.861]	
46-55	-0.17	0.13	-0.16	0.12	-0.26	0.14
	[-0.431;0.083]		[-0.393;0.080]		[-0.531;0.005]	
56-65	-0.308*	0.15	-0.460**	0.15	-0.06	0.15
	[-0.603;-0.013]		[-0.753;-0.166]		[-0.354;0.226]	
66-75	-0.51	0.40	-0.66	0.34	-0.56	0.33
	[-1.297;0.286]		[-1.337;0.012]		[-1.209;0.099]	
>75	-0.29	0.42	-0.70	0.37	-0.45	0.34
	[-1.123;0.540]		[-1.418;0.024]		[-1.115;0.221]	
Female	0.00	0.07	0.00	0.08	0.12	0.08
	[-0.145;0.139]		[-0.148;0.148]		[-0.026;0.269]	
East Germany	0.488***	0.08	0.568***	0.07	0.699***	0.07
	[0.322;0.654]		[0.425;0.711]		[0.557;0.841]	
Marital Status						
Never Married	0.415**	0.15	0.14	0.15	0.347*	0.16
	[0.131;0.700]		[-0.150;0.437]		[0.031;0.662]	
Divorced	0.491**	0.15	0.408**	0.16	0.584***	0.17
	[0.196;0.786]		[0.098;0.718]		[0.260;0.908]	
Widowed	-1.064***	0.19	-1.274***	0.20	-1.197***	0.18
	[-1.426;-0.702]		[-1.661;-0.886]		[-1.557;-0.836]	
Household Type						
Size	0.791***	0.21	0.30	0.23	-0.18	0.30
	[0.379;1.203]		[-0.153;0.758]		[-0.772;0.412]	
Size²	-0.04	0.02	-0.01	0.03	0.06	0.03
	[-0.082;0.002]		[-0.066;0.038]		[-0.009;0.124]	
Single	2.144***	0.22	1.744***	0.20	1.277***	0.25
	[1.705;2.582]		[1.344;2.145]		[0.793;1.761]	
Lone Parent	1.883***	0.17	1.743***	0.18	1.494***	0.19
	[1.551;2.215]		[1.392;2.094]		[1.119;1.869]	
Couple; with children	-0.479*	0.21	-0.33	0.25	0.26	0.24
	[-0.895;-0.063]		[-0.815;0.147]		[-0.203;0.726]	
Other combination	-0.766***	0.21	0.15	0.21	-0.02	0.22
	[-1.186;-0.347]		[-0.257;0.555]		[-0.439;0.408]	
Labout Status and Education						
Unemployed	2.264***	0.13	2.510***	0.13	2.343***	0.14
	[2.014;2.513]		[2.257;2.763]		[2.075;2.610]	
Retired	1.519***	0.39	1.318***	0.34	1.246***	0.30
	[0.749;2.289]		[0.649;1.986]		[0.653;1.840]	
Other inactive	1.625***	0.11	1.525***	0.11	1.280***	0.10
	[1.408;1.843]		[1.318;1.732]		[1.082;1.479]	
Low	0.966***	0.09	0.932***	0.10	1.040***	0.09
	[0.791;1.140]		[0.745;1.120]		[0.863;1.217]	
High	-0.816***	0.11	-1.100***	0.13	-1.010***	0.10
	[-1.037;-0.596]		[-1.345;-0.854]		[-1.203;-0.817]	
Sample	12,365		11,406		10,598	
Pseudo R^2	0.27		0.27		0.27	

Note. The reference household is a household with a male head between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children, and were the head is working, with medium educational level. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. SE denotes the standard error. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. In parentheses, 95 percent bootstrap confidence interval. In order to check the robustness of the results a logit regression including a year indicator variable using the year 2002 as reference variable is conducted. Results can be confirmed and are available upon request. Database is SOEP v30. Own calculations.

9.7 Poverty Groups

Table 13: Poverty Groups

	2002	2007	2012
Households			
Twice-poor	11.7	12.7	12.5
	[11.3;12.2]	[12.3;13.2]	[12.1;13.0]
Protected-poor	2.4	2.8	2.6
	[2.2;2.6]	[2.6;3.1]	[2.4;2.9]
Vulnerable-poor	32.4	31.1	31.6
	[31.7;33.0]	[30.5;31.7]	[30.8;32.4]
Non-poor	53.4	53.4	53.3
	[52.9;54.1]	[52.6;54.0]	[52.5;54.0]

Note. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. In parentheses, 95 percent bootstrap confidence intervals.
Database is SOEP v30. Own calculations.

Table 14: Socio-economic Characteristics of Poverty Groups

(Pop and Poor in percentage)

		2002					2007					2012				
		Pop	Twice	Protected	Vulnerable	Non	**Pop**	Twice	Protected	Vulnerable	Non	**Pop**	Twice	Protected	Vulnerable	Non
	All	100	11.7	2.4	32.4	53.4	100	12.7	2.3	31.6	53.4	100	12.5	2.6	31.6	52.3
Age	<25	3.4	46.3	0.7	44.5	8.5	3.5	48.8	1.9	39.6	9.8	2.9	49.7	0.9	43.6	5.8
	26-35	16.0	14.5	0.7	48.6	36.1	12.3	15.8	1.9	45.3	37.0	10.3	16.7	1.9	52.9	28.5
	36-45	21.3	10.2	1.3	34.1	54.5	20.8	11.6	1.6	36.2	50.6	15.4	10.8	1.5	37.0	50.6
	46-55	16.1	8.6	2.1	26.8	62.5	17.3	12.0	1.7	26.1	60.2	21.4	9.1	2.3	31.7	56.9
	56-65	17.0	8.7	3.5	21.6	66.2	15.6	11.2	3.3	19.9	65.7	17.8	13.2	3.0	22.8	61.0
	66-75	14.2	9.0	4.0	25.6	61.4	17.7	9.4	4.5	26.7	59.4	18.1	9.5	3.6	23.0	63.9
	>75	11.9	12.6	4.5	34.9	48.0	12.7	9.2	4.5	33.5	52.9	14.1	11.5	3.5	29.9	55.0
Sex	Male	59.0	8.3	2.1	29.5	60.1	55.3	9.7	2.5	28.3	59.6	54.0	10.4	2.4	28.4	58.8
	Female	41.0	16.7	2.9	36.5	43.9	44.7	16.5	3.2	34.6	45.7	46.0	14.9	2.8	35.5	46.8
Region	West Germany	81.0	10.5	2.5	30.9	56.1	79.4	10.9	2.7	29.8	56.5	78.3	10.6	2.5	29.9	56.9
	East Germany	19.0	17.1	2.0	38.4	42.5	20.6	19.6	3.2	36.1	41.1	21.7	19.3	2.9	37.7	40.1
Marital Status	Married	48.4	5.0	2.1	25.3	67.6	45.0	6.2	2.2	24.0	67.6	45.5	5.7	2.0	24.2	68.1
	Never Married	24.7	20.5	1.7	40.6	37.2	26.0	20.6	3.2	37.2	39.0	25.0	19.8	2.7	41.6	35.9
	Divorced	12.1	21.5	3.4	40.5	34.6	14.4	23.8	3.2	37.5	35.5	15.2	23.8	3.7	36.3	36.2
	Widowed	14.8	11.1	4.0	34.9	50.0	14.6	8.0	3.8	35.8	52.4	14.2	9.1	3.2	33.1	54.6
Household Type	Single	37.6	17.7	3.2	38.7	40.3	39.5	17.7	3.9	36.9	41.5	40.7	18.9	3.6	35.5	42.0
	Lone Parent	6.1	30.7	2.3	36.4	30.7	6.1	33.4	2.7	36.6	27.4	5.1	27.5	3.7	42.6	26.3
	Couple, with children	16.1	7.4	0.7	33.7	58.3	13.5	7.0	0.8	34.2	57.9	12.0	7.9	1.0	33.5	57.6
	Couple, childless	28.8	4.9	2.4	25.7	67.1	29.3	5.4	2.6	24.0	67.9	31.2	5.2	2.0	26.9	65.8
	Other combination	11.5	5.3	2.6	24.2	67.9	11.5	9.9	1.9	22.9	65.3	11.0	7.1	2.0	23.7	67.3
Labour Status	Working	55.2	7.2	1.0	34.4	57.4	54.1	7.7	1.3	33.6	57.5	54.7	7.8	1.2	35.1	55.9
	Unemployed	5.2	38.1	4.2	32.9	24.8	5.2	53.6	4.5	26.7	15.1	4.3	54.1	7.7	28.6	9.6
	Retired	24.8	10.9	4.2	30.8	54.2	28.1	9.6	4.3	29.6	56.4	29.4	11.0	3.7	26.3	59.0
	Other inactive	14.8	20.9	4.3	27.0	47.7	12.6	24.5	5.3	25.4	44.7	11.5	23.1	4.8	29.6	42.4
Education	Low	17.5	22.6	4.6	37.1	35.7	17.0	24.5	5.3	38.3	31.9	16.0	26.8	4.1	34.4	34.8
	Medium	61.9	10.8	2.3	33.3	53.6	61.3	12.5	2.7	32.2	52.6	60.4	12.1	2.7	33.9	51.3
	High	20.5	5.3	1.0	25.3	68.5	21.7	4.2	1.2	22.5	72.2	23.6	3.7	1.4	23.9	70.9
Property Owner	Yes	41.6	0.2	4.4	3.3	92.1	41.7	0.3	4.7	4.4	90.5	45.5	0.5	4.5	4.6	90.4
	No	58.4	19.9	1.1	53.0	26.0	58.3	21.6	1.5	50.2	26.8	54.5	22.5	1.1	54.2	22.3

Note. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. 95 percent bootstrap confidence intervals are estimated and available upon request.
Database is SOEP v30. Own calculations.

Table 15: Logit Regression, Poverty Groups in 2002

	Twice-poor	SE	Protected-poor	SE	Vulnerable-poor	SE
Constant	-5.710***	0.37	-5.318***	0.75	-0.07	0.29
	[-6.428;-4.992]		[-6.789;-3.847]		[-0.630;0.499]	
Age; Sex Region						
<25	1.746***	0.15	-0.50	1.10	0.375**	0.12
	[1.461;2.032]		[-2.661;1.658]		[0.134;0.617]	
26-35	0.381***	0.12	-0.49	0.37	0.638***	0.07
	[0.156;0.605]		[-1.209;0.231]		[0.506;0.770]	
46-55	-0.17	0.13	0.19	0.30	-0.461***	0.07
	[-0.429;0.081]		[-0.390;0.770]		[-0.599;-0.323]	
56-65	-0.308*	0.15	0.576*	0.27	-0.714***	0.09
	[-0.609;-0.007]		[0.048;1.104]		[-0.884;-0.543]	
66-75	-0.51	0.41	0.84	0.56	-1.079***	0.20
	[-1.313;0.302]		[-0.256;1.936]		[-1.478;-0.681]	
>75	-0.29	0.42	0.85	0.60	-0.928***	0.23
	[-1.119;0.536]		[-0.332;2.034]		[-1.380;-0.476]	
Female	0.00	0.08	-0.07	0.15	0.0998*	0.05
	[-0.159;0.153]		[-0.368;0.229]		[0.012;0.188]	
East Germany	0.488***	0.08	-0.16	0.18	0.339***	0.05
	[0.332;0.644]		[-0.503;0.187]		[0.240;0.439]	
Marital Status						
Never Married	0.415**	0.16	-0.44	0.41	0.242**	0.09
	[0.106;0.725]		[-1.239;0.366]		[0.065;0.418]	
Divorced	0.491**	0.17	-0.21	0.39	0.544***	0.09
	[0.154;0.827]		[-0.973;0.548]		[0.363;0.726]	
Widowed	-1.064***	0.19	-0.79	0.43	0.357***	0.10
	[-1.436;-0.692]		[-1.627;0.040]		[0.154;0.560]	
Household Type						
Size	0.791***	0.20	0.27	0.43	-0.465**	0.17
	[0.396;1.187]		[-0.567;1.103]		[-0.797;-0.134]	
Size²	-0.0400*	0.02	-0.01	0.05	0.0390*	0.02
	[-0.080;-0.000]		[-0.097;0.080]		[0.001;0.077]	
Single	2.144***	0.21	1.344**	0.46	-0.21	0.14
	[1.738;2.549]		[0.440;2.247]		[-0.474;0.057]	
Lone Parent	1.883***	0.19	0.57	0.52	-0.13	0.13
	[1.521;2.246]		[-0.449;1.591]		[-0.379;0.114]	
Couple; with children	-0.479*	0.23	-0.51	0.48	0.305**	0.12
	[-0.922;-0.036]		[-1.446;0.434]		[0.075;0.536]	
Other combination	-0.766**	0.24	-0.24	0.41	0.271*	0.12
	[-1.232;-0.300]		[-1.050;0.565]		[0.047;0.496]	
Labout Status and Education						
Unemployed	2.264***	0.12	1.288***	0.25	-0.250*	0.10
	[2.034;2.493]		[0.793;1.783]		[-0.447;-0.052]	
Retired	1.519***	0.40	0.52	0.52	0.571**	0.20
	[0.735;2.303]		[-0.504;1.550]		[0.188;0.953]	
Other inactive						
	1.625***	0.10	1.108***	0.20	-0.13	0.07
Low	[1.428;1.823]		[0.709;1.508]		[-0.258;0.006]	
	0.966***	0.08	0.32	0.17	0.377***	0.05
High	[0.799;1.132]		[-0.016;0.646]		[0.269;0.484]	
	-0.816***	0.12	-1.208***	0.29	-0.616***	0.05
	[-1.055;-0.578]		[-1.766;-0.650]		[-0.714;-0.519]	
Sample	12,365		12,365		12,365	
Pseudo R^2	0.27		0.09		0.07	

Note. The reference household is a household with a male head between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children, and were the head is working, with medium educational level. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. SE denotes the standard error. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. In parentheses, 95 percent bootstrap confidence interval. A further robustness check for the results is conducted. For each poverty group a logit regression including a year indicator variable using the year 2002 as reference variable is conducted. Results can be confirmed and are available upon request.
Database is SOEP v30. Own calculations.

Table 16: Logit Regression, Poverty Groups in 2007

	Twice-poor	SE	Protected-poor	SE	Vulnerable-poor	SE
Constant	-4.469***	0.38	-5.223***	0.77	-0.46	0.26
	[-5.218;-3.720]		[-6.726;-3.721]		[-0.971;0.047]	
Age; Sex Region						
<25	1.782***	0.16	-0.26	0.40	0.02	0.12
	[1.473;2.092]		[-1.052;0.523]		[-0.220;0.257]	
26-35	0.523***	0.13	-0.12	0.27	0.566***	0.07
	[0.274;0.771]		[-0.642;0.413]		[0.430;0.703]	
46-55	-0.16	0.13	0.14	0.24	-0.517***	0.08
	[-0.407;0.094]		[-0.341;0.614]		[-0.670;-0.364]	
56-65	-0.460**	0.16	0.02	0.26	-0.703***	0.09
	[-0.772;-0.148]		[-0.497;0.529]		[-0.873;-0.532]	
66-75	-0.66	0.35	0.48	0.39	-0.555***	0.16
	[-1.338;0.014]		[-0.295;1.245]		[-0.860;-0.250]	
>75	-0.70	0.38	0.56	0.42	-0.29	0.18
	[-1.449;0.055]		[-0.269;1.380]		[-0.637;0.059]	
Female	0.00	0.07	0.09	0.14	0.08	0.05
	[-0.138;0.138]		[-0.193;0.370]		[-0.026;0.180]	
East Germany	0.568***	0.07	0.06	0.13	0.347***	0.05
	[0.427;0.709]		[-0.192;0.317]		[0.245;0.450]	
Marital Status						
Never Married	0.14	0.15	0.05	0.33	0.354***	0.08
	[-0.147;0.434]		[-0.585;0.688]		[0.191;0.517]	
Divorced	0.408**	0.15	-0.32	0.34	0.593***	0.08
	[0.121;0.696]		[-0.978;0.336]		[0.428;0.759]	
Widowed	-1.274***	0.21	-0.894**	0.35	0.443***	0.11
	[-1.679;-0.869]		[-1.572;-0.215]		[0.236;0.651]	
Household Type						
Size	0.30	0.21	0.46	0.46	-0.28	0.16
	[-0.108;0.713]		[-0.429;1.354]		[-0.599;0.046]	
Size²	-0.01	0.02	-0.02	0.06	0.03	0.02
	[-0.060;0.033]		[-0.131;0.084]		[-0.012;0.064]	
Single	1.744***	0.18	1.277**	0.46	-0.07	0.12
	[1.389;2.100]		[0.380;2.173]		[-0.308;0.171]	
Lone Parent	1.743***	0.18	0.68	0.39	0.05	0.11
	[1.395;2.091]		[-0.087;1.442]		[-0.176;0.271]	
Couple; with children	-0.33	0.24	-1.329**	0.46	0.241*	0.12
	[-0.807;0.139]		[-2.239;-0.420]		[0.002;0.480]	
Other combination	0.15	0.18	-0.77	0.40	0.04	0.13
	[-0.210;0.508]		[-1.562;0.016]		[-0.207;0.296]	
Labout Status and Education						
Unemployed	2.510***	0.13	0.894***	0.24	-0.447***	0.12
	[2.247;2.772]		[0.421;1.366]		[-0.672;-0.223]	
Retired	1.318***	0.33	0.55	0.35	-0.04	0.15
	[0.667;1.968]		[-0.145;1.235]		[-0.330;0.259]	
Other inactive	1.525***	0.11	1.314***	0.17	-0.306***	0.08
	[1.305;1.745]		[0.981;1.646]		[-0.461;-0.151]	
Low	0.932***	0.09	0.27	0.15	0.332***	0.07
	[0.763;1.102]		[-0.027;0.560]		[0.200;0.464]	
High	-1.100***	0.13	-0.858***	0.20	-0.608***	0.06
	[-1.347;-0.853]		[-1.243;-0.474]		[-0.717;-0.498]	
Sample	11,406		11,406		11,406	
Pseudo R^2	0.27		0.08		0.07	

Note. The reference household is a household with a male head between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children, and were the head is working, with medium educational level. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. SE denotes the standard error. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. In parentheses, 95 percent bootstrap confidence interval. A further robustness check for the results is conducted. For each poverty group a logit regression including a year indicator variable using the year 2002 as reference variable is conducted. Results can be confirmed and are available upon request.
Database is SOEP v30. Own calculations.

Table 17: Logit Regression, Poverty Groups in 2012

	Twice-poor	SE	Protected-poor	SE	Vulnerable-poor	SE
Constant	-3.756***	0.48	-5.484***	0.78	-0.11	0.36
	[-4.703;-2.809]		[-7.011;-3.956]		[-0.810;0.594]	
Age; Sex Region						
<25	1.956***	0.18	-1.02	2.05	-0.13	0.12
	[1.602;2.309]		[-5.033;3.003]		[-0.367;0.118]	
26-35	0.597***	0.14	-0.35	0.31	0.528***	0.08
	[0.314;0.880]		[-0.950;0.255]		[0.378;0.678]	
46-55	-0.26	0.14	0.30	0.29	-0.454***	0.07
	[-0.546;0.020]		[-0.278;0.870]		[-0.600;-0.308]	
56-65	-0.06	0.15	0.35	0.28	-0.922***	0.10
	[-0.356;0.227]		[-0.205;0.899]		[-1.113;-0.730]	
66-75	-0.56	0.32	0.35	0.45	-0.918***	0.16
	[-1.182;0.072]		[-0.527;1.219]		[-1.234;-0.602]	
>75	-0.45	0.33	0.15	0.45	-0.627***	0.17
	[-1.093;0.199]		[-0.729;1.028]		[-0.966;-0.288]	
Female	0.12	0.08	0.10	0.14	0.136**	0.05
	[-0.031;0.273]		[-0.176;0.384]		[0.045;0.226]	
East Germany	0.699***	0.08	0.10	0.15	0.340***	0.05
	[0.544;0.854]		[-0.198;0.392]		[0.237;0.442]	
Marital Status						
Never Married	0.347*	0.15	-0.11	0.37	0.451***	0.09
	[0.050;0.644]		[-0.831;0.607]		[0.283;0.619]	
Divorced	0.584***	0.15	-0.48	0.40	0.721***	0.09
	[0.289;0.879]		[-1.272;0.312]		[0.544;0.897]	
Widowed	-1.197***	0.18	-1.011*	0.42	0.546***	0.11
	[-1.542;-0.851]		[-1.826;-0.195]		[0.333;0.758]	
Household Type						
Size	-0.18	0.29	0.27	0.46	-0.29	0.23
	[-0.749;0.389]		[-0.629;1.160]		[-0.731;0.151]	
Size²	0.06	0.03	0.00	0.05	0.02	0.03
	[-0.007;0.121]		[-0.094;0.101]		[-0.037;0.070]	
Single	1.277***	0.25	1.488**	0.48	-0.371*	0.16
	[0.796;1.759]		[0.553;2.423]		[-0.678;-0.063]	
Lone Parent	1.494***	0.20	0.895*	0.43	-0.13	0.12
	[1.112;1.877]		[0.048;1.743]		[-0.361;0.106]	
Couple; with children	0.26	0.24	-0.39	0.44	0.08	0.14
	[-0.201;0.724]		[-1.254;0.472]		[-0.189;0.353]	
Other combination	-0.02	0.23	-0.17	0.41	0.01	0.14
	[-0.459;0.428]		[-0.980;0.632]		[-0.257;0.286]	
Labout Status and Education						
Unemployed	2.343***	0.13	1.445***	0.23	-0.601***	0.14
	[2.095;2.590]		[0.997;1.892]		[-0.866;-0.336]	
Retired	1.246***	0.31	1.064**	0.40	0.05	0.16
	[0.647;1.846]		[0.282;1.846]		[-0.257;0.361]	
Other inactive	1.280***	0.11	1.209***	0.21	-0.15	0.08
	[1.070;1.491]		[0.803;1.616]		[-0.303;0.008]	
Low	1.040***	0.09	0.30	0.16	0.150*	0.06
	[0.869;1.211]		[-0.013;0.619]		[0.023;0.276]	
High	-1.010***	0.10	-0.745***	0.18	-0.468***	0.05
	[-1.206;-0.814]		[-1.099;-0.391]		[-0.576;-0.361]	
Sample	10,598		10,598		10,598	
Pseudo R^2	0.27		0.08		0.07	

Note. The reference household is a household with a male head between 36 and 45 years of age who is married and lives with his spouse in West Germany, without children, and were the head is working, with medium educational level. Year is survey year. Pooled household wealth and income information is used and based on current year's wealth and previous year's income. Wealth top-coding at 99.9 percentile. Household head living in private household is analyzed at 2010 prices. SE denotes the standard error. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. In parentheses, 95 percent bootstrap confidence interval. A further robustness check for the results is conducted. For each poverty group a logit regression including a year indicator variable using the year 2002 as reference variable is conducted. Results can be confirmed and are available upon request.
Database is SOEP v30. Own calculations.