

## **Income, Expenditure and Standard of Living as Poverty Indicators – Different Measures, Similar Results?**

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### **Abstract**

Individual welfare can be assessed from two directions: either directly by looking at the standard of living the individual has actually attained or indirectly by studying the resources available to the individual. Direct and indirect welfare indicators are afflicted by specific conceptual and empirical problems. Therefore, instead of (arbitrarily) selecting one single indicator for poverty analysis, it is argued that different indicators should be thought of as complementary rather than competitive. As a step towards a better understanding the article investigates systematically the measurement characteristics of both direct and indirect poverty indicators. Poverty indicators derived from data on expenditures as well as on living conditions and participation in social activities are compared to the usual income statistics and, as expected, the indicator based on expenditures (the money equivalent of the standard of living) shows a much higher compatibility with the income data than the proposed measure of deprivation from a socially accepted „style of living“. The latter „agrees“ only in the lower ranks of the distribution with the income indicator. Therefore, the proposed measure of deprivation seems to be a good indicator to identify individuals that have a low standard of living because of few resources, especially because of low incomes. Additionally, significant differences in the socio-demographic profiles of the individuals classed as poor by each of the three poverty indicators are observed. Household size shows the largest differences, but to a large extent this can be attributed to different assumptions on economies of scale implied by each indicator used in the analysis. The expected differences with respect to age, specific occupational groups and household types can only partially be confirmed and need more research, preferably using longitudinal data.

*Keywords: poverty measurement, expenditure and income survey, deprivation.*

### **1. Introduction<sup>1</sup>**

It is a common practice in poverty research to use household income as a measure of welfare both on the individual and the household level. Income

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data are readily available through nation-wide representative surveys and, by using suitable transformations, can be compared between households of different size and across different nations. Applying a relative concept of poverty, individuals are classified as (income) poor if their household equivalent income falls short of a given percentage, e.g. 50%, of the national mean income. Although it has become a routine procedure, this approach has also been criticized in various aspects including, for example, the unreliability of income measurements, the neglect of wealth, fringe benefits, household production, and temporal income variations, the dependence on assumptions about economies of scale and the ad-hoc nature of the applied poverty thresholds (see for an overview Piachaud, 1987, Ringen, 1988, Burkhauser et al., 1997). Besides these empirical criticisms, some researchers have argued that, instead of looking at (income) resources, it may be more appropriate to analyze the standard of living that individuals have actually acquired by using whatever resources are available to them (Townsend, 1979, Mack/Lansley, 1985, Nolan/Whelan, 1996). It has been claimed that this approach yields a more *direct* measure of welfare and poverty, as opposed to measures of (income) resources, which only indicate opportunities, but do not necessarily imply a certain standard of living. Given the fact that resources can be used in different ways depending on the individual's preferences and capabilities, income (and similar indicators of available resources) can only be an *indirect* (and potentially unreliable) measure of welfare and poverty.

Although theoretically appealing, this second approach has its limitations too. First of all, an operational definition of the standard of living in a given society is needed against which one can compare the living situation of households and individuals in order to classify them as either poor or not poor. In a way, budget standards constitute such a definition, but it is known that the inclusion of certain items (and the exclusion of others) implies normative decisions which are subject to frequent social change. Secondly, the question arises whether such standards should only include goods and services which can be purchased in the market. If the answer is yes, one can use data on household expenditures to determine the household's standard of living. But if the standard should also contain goods and services that are supplied free of charge either by the state or by other social structures, one needs specific measures to ascertain the individual's consumption of these items. Thirdly, even if one restricts the analysis to expenditure data, it is usually far more complicated and costly to collect this kind of information than income data. Not surprisingly, expenditure surveys are mostly carried out by governmental statistical agencies and need a long time of production until the data are ready for analysis.

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In line with other researchers, we do not opt for one or the other approach to poverty measurement. Both direct and indirect measures tell a story about welfare and poverty and by focusing only on one indicator specific aspects are neglected. But given the predominant use of income data in current poverty research we want to show what additional information can be obtained from using data on living standards. Our approach is not entirely new. Previous analyses have shown clear differences in the measurement of poverty by comparing data on income with data on standard of living (Kangas / Ritakallio, 1998) or data on expenditures (McGregor / Borooah, 1991, Short et al., 1998). Similar research, however, is rare for Germany. To our knowledge only one comparative study by Mayer (1995) is available that includes German data. Therefore, using German survey data, we determine a measure of welfare based on consumption and standard of living which we compare with the usual measure based on income to answer the following research questions: Do both, indirect and direct, indicators of welfare yield similar or different rankings of individuals? Do they classify similar or different individuals as poor? We use expenditure data as well as a list of items concerning the standard of living in Germany to answer these questions. The latter methodology was developed by Mack and Lansley (1985) and is easily applied in survey research. Therefore, it constitutes a practical alternative to the far more costly expenditure surveys. If our results make sense, its future application can be as a routine task like the usual income statistics.

The paper is organized as follows: in section 2 we define direct and indirect poverty indicators. Based on a restricted set of well known poverty risks, we then formulate hypotheses whether these indicators, given the measurement problems discussed before, adequately represent the corresponding risk groups in the population. Section 3 introduces the two surveys and the methodology used in our analysis. We demonstrate the operationalization of our poverty indicators, which are based on income, expenditures, and standard of living. Finally, in section 4, the results are presented in three steps: 1. How many individuals are classed as poor? 2. Are the same individuals classed as poor by different indicators? 3. What is the socio-demographic profile of the poor given a specific indicator? The paper concludes with a summary and discussion of the results.

## **2. Definitions and Hypotheses**

### **2.1 Direct and Indirect Indicators of Welfare**

In order to recognize the different dimensions of welfare which are captured by direct and indirect indicators we use a very general definition of

poverty: individuals are classified as poor if their resources do not satisfy their vital needs. This definition includes two terms, resources and needs, which should be explained briefly. *Resources* are the means that individuals use to achieve certain goals, here: to achieve a certain standard of living. In doing so, individuals tend to group themselves into larger units, households as a rule, for the purpose of pursuing this goal more efficiently by sharing resources. Besides that, additional resources are supplied by more general social structures outside these groupings, e.g., by the social network, the state, the market, or by non-profit organizations. Correspondingly, one can distinguish between human resources of each household member (knowledge, capabilities, education, health, etc.), material and personal resources of the household (wealth, pension rights, household composition, etc.), and social resources coming from outside (private and public social infrastructure).

Compared to this, a definition of *needs* is far more difficult, because every specification of human needs necessarily includes normative judgements and depends on the historical and social circumstances. Moreover, our definition of poverty refers to *basic* or *vital* needs and this raises the question of how to distinguish basic or vital needs from human needs in general. Should one focus on the physical survival of the individual or should one use a so-called socio-cultural minimum of existence? For a long time poverty researchers believed that an absolute (time-invariant) definition of basic needs is feasible, but at least for modern industrialized countries it has been accepted that such a standard can only be defined *relatively* to the given standard of living of the corresponding country (see Piachaud, 1987). This is done by either referring to expert ratings, by using decisions of the political or legal system, or simply by applying statistical criteria. The approach that is used in our analysis is a mixture of statistical and expert-based criteria, but the main difference to other approaches is that observed behavior and the opinions of a sample of the general public is used to assess these decisions.

To summarize this definition: individuals use personal, household-related, and external resources to produce individual welfare. Their standard of living is the result of their individual behavior. How they use available resources to pursue this goal, depends on their individual preferences. Therefore, equal resources will not necessarily yield the same standard of living. Given this distinction between resources on the one side and results of individual behavior on the other, we can separate *direct* from *indirect* indicators of welfare: „If welfare is measured directly, we establish what intrinsic goods individuals command, for instance their standard of consumption. If welfare is measured indirectly, we establish what resources individuals command, for instance their disposable income“ (Ringen, 1988, 355).

Following Ringen's terminology we will regard income as an indirect, expenditure and standard of living as direct indicators of welfare. The term „indicator“ is chosen deliberately to emphasize the fact that the three variables are potentially imperfect and unreliable measures of the underlying theoretical constructs „resources“ and „needs“. The main restriction of income and expenditure is that both focus on the monetary part of resources and standard of living. In contrast, by using a direct measure based on monetary *and non-monetary* items that are supposed to reflect the society's style of living a more comprehensive picture of the standard living can be given. However, the question remains which dimensions to include in this list of monetary and non-monetary items.

## 2.2 How do Different Indicators Measure Poverty Risks?

Previous research has shown that poverty risks are determined, besides other factors, by employment and educational status, by household type, by age, gender and regional differences. In general, we expect persons without gainful employment and with low educational degrees (as a proxy for their earnings capacity) to have the highest poverty risks. People living on transfer incomes like, e.g., pensioners and to some extent participants in the educational system, may have higher poverty risks depending on their former employment careers or on their employment prospects.

Concerning household type, previous studies have shown a u-shaped distribution of poverty risks. Especially, with respect to the age of the household head, young families and older households are at higher risk to be poor. Therefore, household type or, more specifically, household type by age of the household head are usually good predictors of poverty risks (see Rowntree, 1980). Women face additional poverty risks because of the gender-specific division of labor in the household. Losses of human capital and pension rights because of (temporary) retreats from the labor market when caring for (small) children and the household may turn out disastrous when the partnership breaks down or the husband dies. Besides that, discrimination in the labor market and gender-specific differences in power may augment the poverty risks of women (see Daly, 1989, Pahl, 1989, Payne, 1991).

Finally, it is a well known fact that there are dramatic differences in the cost of living between different regions within one country. For instance, housing costs are less high in rural compared to urban areas and this may cause additional poverty risks especially in urban regions. For reunified Germany the case is even more complicated because of different price structures between East and West Germany in the transformation period.

We now turn to the question how these different poverty risks are captured by indirect and direct welfare indicators. It seems obvious that both types of measures somehow correlate with each other because a given standard of living cannot exceed available resources, at least in the long run. In terms of money, income is the sum of expenditures and savings/dissavings. However, the more indicators of living standards measure non-monetary goods and the more indicators of resources measure current household income, ignoring wealth, fringe benefits, household production, temporal income variations and human capital resources, the less both types of indicators have in common. Therefore, we expect a lower correlation between multidimensional indices of standard of living and household (equivalized) income than between consumption expenditures and household (equivalized) income.

A second source of discrepancies are measurement errors. They have been studied most intensively with data on expenditures and income. As mentioned in the literature, income information for certain subgroups and for certain income types is not always reliable.<sup>2</sup> In this case expenditure data may give a much more realistic picture. Data on expenditures are based on consumption, which generally is regarded as being less affected by effects of irregular and informal incomes (see, e.g., the estimation of incomes from the shadow economy based on expenditure data in Pissarides/Weber, 1989). It has also been argued that income data show temporary fluctuations, especially when measured at a certain point in time (e.g., monthly income) and not within a longer time interval (e.g., yearly income). Data on expenditures and standard of living, on the other hand, usually characterize a longer time period and, therefore, are the result of some sort of permanent income. At least, they do not immediately react to income losses and may reflect future income gains.

Finally, certain standards of living are clearly age dependent, since the cost of buying these items requires a certain amount of capital on the side of the purchaser, which is usually available only after some years of gainful employment have passed (Hagenaars/de Vos, 1988). This pertains predominantly to housing and to certain consumer durables. On the other hand, we have to recognize that younger people, taking credit on their future earned incomes, will have higher expenditures than incomes, while older people, except for specific needs (e.g., health), will consume less than they earn.

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<sup>2</sup> Income data are hard to obtain for individuals living on irregular or informal resources (e.g., income from self-employment or the shadow economy, capital incomes, private transfers). This results in a, partly marked, underreporting of these incomes in general surveys (see, e.g., Atkinson et al., 1995, pp. 11).

With these differences in mind, we expect that poverty statistics based on direct and indirect indicators of welfare will disagree with respect to age, for specific occupational groups and household types, and for individuals that have experienced significant income changes. Referring to the aforementioned risk groups, these expectations can be specified as follows: younger individuals, including families with small children, subgroups of the unemployed, the self-employed, and one-parent families score higher on direct indicators (expenditure, standard of living) than on indirect indicators (income), because they either take credit on their future incomes, their income measures are unreliable, or their consumption behavior has not yet adapted to their lowered incomes. Older people, specifically pensioners, show the opposite behavior and, therefore, score higher on indirect than on direct indicators. This is especially true when using indices of standard of living that include items with a clear age-specific distribution in the population.

### 3. Data and Operationalization

#### 3.1 Data

The intended comparative analysis of different poverty indicators is not an easy task in the German situation, because no single data base exists that includes all indicators discussed. Results from two different data sets are therefore combined: the German Income and Expenditure Survey 1993 (EVS) is used for a comparative analysis of income and expenditure data and the Social Sciences Bus Survey III/1996 (SWB) is used for a comparison between data on income and standard of living. The EVS is part of the German federal statistics. The SWB is a multitopic survey which has been conducted in joint cooperation by the Center for Survey Research and Methodology (ZUMA) and a commercial survey research institute (GFM-Getas/WBA). The two databases differ with respect to survey design, sample size, and sampling strategy and this section describes our efforts to make them comparable.

The EVS is a quota sample based on all households in Germany excluding individuals in institutions and households with a monthly net income above DM 35,000 (Stat. Bundesamt, 1997, 21). The survey consists of three main parts: two interviews, one at the beginning and another at the end of the survey year, and a household diary, in which the interviewed households report income, expenditure and changes in the household structure.<sup>3</sup> The rea-

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<sup>3</sup> Income and expenditures are reported every month. This does not include expenditures on food (incl. eating out) and tobacco which are gathered in a more detailed

lized sample for the first interview comprised 56,456 households, but only 49,959 households participated in all three parts of the survey (Pöschl, 1993). In our analysis we used a 80% scientific use subsample including 40,230 households. Due to the fact that some sample strata are over- or underrepresented redressment weights are necessary.<sup>4</sup>

The SWB is a stratified 3-stage random sample from the population of adult individuals of German nationality living in private households. The sample has been obtained separately for East (n=1,181) and West Germany (n=1,989) with an oversampling of the East German population. Joint analysis for both parts of the country therefore necessitates the use of design weights controlling for the oversampling.

In order to make the two samples comparable the EVS data had to be transformed from a sample of households to a sample of individuals of German nationality. Firstly, households of foreigners (defined as households in which the household head is foreign) had to be excluded. This reduced the sample size to 39,612 households. Secondly, we weighted the original sample units (households) by the number of adults living in each household. Using these transformation weights we ended up with a sample of 75,747 individuals.

The following analysis only reports the weighted results (i.e., using design weights in the case of the SWB, redressment *and* transformation weights in the case of the EVS). Since there is some concern about the possible detrimental effects of transforming a household sample to a sample of individuals, we repeated the weighted analyses for the EVS *not* using the transformation weights (i.e., performing a weighted analysis of *households*). In sum, the conclusions were basically the same.<sup>5</sup> Given the large sample size of the EVS and the fact that it is no true random sample, we mainly looked at the

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manner, but only during one month (Stat. Bundesamt, 1997, 14 ff.). Therefore, yearly expenditures on food and tobacco are estimated on the basis of these monthly data.

<sup>4</sup> The basis for these weights – which are calculated by the Federal Statistical Office – is the Mikrozensus 1993, an obligatory 1%-sample of the total population. Compared to random selection, quota samples have less desirable properties: among them uncontrolled selection strategies of the interviewers. Nevertheless, within the limits of its sampling frame (exclusion of institutionalized population, high incomes) the EVS is considered a highly reliable data source due to its large sample size and its projection with the Mikrozensus. For a comparison with other European household budget surveys see Eurostat (1997).

<sup>5</sup> When we reestimated the logit models on poverty risks (cf. section 4.3) without transformation weights only marginal differences appeared. In none of the models changes of the sign of statistically significant coefficients (5%-level) or larger deviations in the size of coefficients could be observed. The few minor changes showed a tendency towards slightly higher poverty risks for households without children and lower poverty risks for households with minor children. In total, models using transformation weights produce slightly less extreme results, but the general picture of poverty risks is the same as in the household data.



size of the estimates and used test statistics only as side information. The SWB is a random sample, but we adjusted test statistics for the survey sampling procedures (clustering, stratification). Therefore, standard errors and Wald tests in the case of the SWB are robust (Huber / White) and rather conservative estimates.

### 3.2 Indicators of Welfare

#### 3.2.1 *Income Indicators*

The income measures used in our analyses are available in both databases. The EVS income data is gathered from the household diaries. Therefore, it contains detailed income information which distinguishes different forms of income. As income indicator we used the yearly household net income which has been computed as the sum of gross labor income, income from wealth, income from public and private transfers, gifts below DM 2,000, income from subletting, minus taxes, compulsory social insurance and pension scheme payments. Since households with incomplete diaries were excluded from the main sample, income information is complete for all remaining cases.

The interviewed persons in the SWB have been asked to report the net income of the household, i.e., the sum of wages, salaries, income from self employment and pensions after deducting taxes and social insurance payments. Nonresponse was quite substantial: 1158 (37%) of the 3170 respondents refused to report exact figures for the household income. These persons have been asked to report the approximate income on a categorical scale. Where possible missing information on the 'exact' income has been imputed by using the class midpoints of this categorical scale. This reduced the number of households with missing household income to 625 (20%).<sup>6</sup>

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<sup>6</sup> This treatment of missing values reduces the variance of our dependent variable. Alternatively, one could employ a multiple imputation procedure (Rubin, 1987), which uses random draws from the conditional distributions of income values estimated from a multiple regression of household income on various independent variables. In this case, even the households which gave no income information at all (N=625) would be assigned an imputed value. However, there is a trade-off between estimated data from a statistical model with certain simplifying assumptions and information given by the respondents themselves, even when it is rather crude. Basically, we use the income data for two purposes: 1. to estimate mean equivalized household income and 2. to distinguish individuals in the lower ranks of the income distribution (the „poor“) from the others. Thus, from a statistical point of view the choice of the imputation procedure depends on the question whether there is bias in the mean's estimate and misclassification of the poor. Using the simple imputation procedure the estimate of mean equivalized household income (2,046 DM) is not much different from other estimates based on more comprehensive data sets: e.g., the German Socio-Economic Panel (GSOEP), for which Hanesch et al. (2000, pp. 56) compute a mean income of 1,978 DM for 1996 (both means were calculated using the old

Nominal incomes in both data sets were corrected for differences in purchasing power in East and West Germany by multiplying East German incomes by a factor of 1.127 for 1993 (EVS) and by a factor of 1.056 for 1996 (SWB; Habich/Krause, 1997, 517, Krause, 1998, 38).

### 3.2.2 *Expenditure Indicators*

The expenditure information in the EVS is also taken from the household diaries. We used expenditures for private consumption only. It is defined as total household expenditure for goods and services, including 1. food and tobacco products, 2. clothing and shoes, 3. housing, 4. energy, 5. other household related goods, 6. body and health care, 7. transport and communication, 8. education and entertainment, 9. personal belongings and other goods and services (Stat. Bundesamt, 1997, pp. 25). Since housing and energy costs are highly dependent we regard the two as one category. As expenditure indicator we used the yearly sum of these eight categories, corrected again for differences in purchasing power in East and West Germany (see above).

### 3.2.3 *Indicators of Standard of Living and Deprivation*

Measuring standard of living is not as straightforward as measuring incomes or expenditures, because standard of living, as defined in section 2, is a multidimensional concept including monetary and non-monetary goods, which result both from individual behavior and more general social structures (households, social network, state, market, non-profit organizations). Several methodological problems have to be tackled: 1. How to sample the characteristic features (items) from the universe of possible standards of living? 2. How to aggregate the presence or absence of these items for the interviewed individuals? 3. What to do if people prefer not to have certain items? Our definition of poverty referred to basic or vital needs and given this definition it is no sensible strategy to sample the whole universe of conceivable items including those for the affluent as well as those for the poor. In other words: within the context of poverty measurement we are not interested in the distribution of living standards in general, our main focus is the lower

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version of the OECD equivalence scale). As described in section 3.4, we use a rather ad-hoc criterion to distinguish the (income) poor from the non-poor. To check the sensitivity of our results, we slightly vary this criterion in the empirical analyses; and in doing so, we implicitly test for possible misclassifications. Finally, analyses by Strengmann-Kuhn (1999) show that classified income data from the Mikrozensus yield comparable poverty rates to the GSOEP using exact incomes.

end of the distribution. However, the problem remains how to distinguish an absolutely necessary standard of living that satisfies basic or vital human needs from the many other ways people entertain their life. The answer is either a theory of human need (see, e.g., Doyal / Gough, 1991) or a thorough empirical analysis of what people (laymen, experts) in a given society conceive of as the necessary standard of living. Fortunately, there exists a large body of empirical research on the second approach, on which we can build upon (for an overview see Lipsmeier, 2000). We follow the procedure proposed by Mack and Lansley (1985) in reply to Townsend's seminal work: Instead of using a predefined list of items measuring the „community's style of living“, as Townsend did, they presented a representative sample of individuals a thoroughly pretested sample of possible items and these individuals had to decide which items to include in the necessary standard of living. This approach has certain similarities with the work of van Praag and others (van Praag, 1971, Goedhart et al., 1977), who try to establish a minimum necessary income by corresponding survey questions. Although references to the public opinion on the necessary standard of living do not prevent the inclusion of irrelevant items, this approach, like in the case of income evaluation questions, yields a lot of empirical information to check and correct its measurement characteristics.<sup>7</sup>

More specifically, our approach can be described as a three stage procedure, in which we tried to solve each of the aforementioned methodological problems. In a *first step* the respondents from the SWB have been asked to state for a set of 35 items from a wide range of living conditions and social activities whether they would consider them as necessary to maintain or ensure a sufficient standard of living for all people in Germany. The items covered the following dimensions: nutrition (3 items), personal needs and household amenities (8 items), surroundings and characteristics of the home (6 items), ability to meet regular expenses (e.g., rent, electricity) and savings (3 items), vocational education (1 item), leisure activities (3 items), social contacts (2 items), health care (1 item), specific needs for families with children (4 items), and characteristics of working conditions (4 items). 30 of the 35 items have been classed as necessary by a majority of the sample and we define these 30 items (see appendix) as the minimum acceptable standard of living.<sup>8</sup>

<sup>7</sup> For the approach by van Praag and others see, e.g., Kapteyn et al. (1988). Lipsmeier (2000) analyzes the validity and reliability of our measurements.

<sup>8</sup> Our selection of items in the original questionnaire was mainly inspired by the pioneering work of Mack and Lansley (1985). After extensive pretests we focussed primarily on rather basic items to avoid (as far as possible) a biased measurement of the necessary standard of living by including „luxury“ items. On the other hand we can not completely rule out the possibility that we (and other researchers in this field) have omitted relevant items. This is especially likely for items that are at least partially provided without direct spending of financial resources by the respondents.

In a *second step* the interviewed persons have been asked to state whether they personally or their household possesses these goods or engages in the described activities. Possible answers have been „Yes“, „No, not possible due to financial reasons“ and „No, does not apply for me/us due to other reasons“. The distinction between financial and other reasons intends to control the absence of certain items because of individual preferences (e.g., the vegetarian not eating meat). If an item is stated missing due to a shortage of financial resources this indicates for us deprivation from one aspect of the minimum acceptable standard of living as defined by the aforementioned majority rule.<sup>9</sup>

To measure the extent of deprivation experienced by each individual or household we computed in a *third step* an additive index counting the number of necessary items that are missing due to financial reasons. Since four of the items only apply to households with children and another four only to employed people, we divided the resulting score by the number of items that are applicable for the specific household. By multiplying this normalized deprivation score with 100 the resulting index has a straightforward interpretation as the percentage of applicable necessary items that are missing for financial reasons.<sup>10</sup>

### 3.3 Comparing Households of Different Size and Composition

To obtain comparable income and expenditure data for households of different size and composition it is a common approach to divide household income and expenditure by the weighted sum of household members according to a so-called equivalence scale. The choice of a specific equivalence scale, however, has rather strong distributional effects as shown by Buhmann et al. (1988). Therefore, we will use two different scales to test the sen-

<sup>9</sup> To assess the reliability of the given reason for lacking items we have checked the correlation with income and examined the proportion of respondents in the upper and lower income decile (not documented here, see Lipsmeier, 2000, pp. 105). For all items of the minimum acceptable standard of living the correlation of financial reasons with income is distinctly stronger negative than for other reasons. A maximum of 3.8% of the respondents with an income in the upper decile report financial reasons for lacking an item as opposed to a maximum of 47.7% in the lower decile. Generally the proportion giving financial reasons in the upper decile is below 1%, while it is clearly above 10% for most items in the lower decile.

<sup>10</sup> To simplify our interpretations we refrained from using any weighted indices, e.g., controlling for differences in necessity evaluations or in the dissemination of certain items. Besides that, weighted indices produced similar results with the SWB data, because they correlate extremely high with unweighted indices (Lipsmeier, 1999). An interesting alternative, suggested by one referee, controls for differential deprivation effects of lacking certain items by including a mean market price for each item as an item specific weight. New data collections are necessary to check whether this proposal is feasible. In any case, it will be difficult to define market prices for non-monetary goods (e.g., neighborhood contact).

sitivity of our results: on the one hand the revised version of the so called German social assistance scale („BSHG scale“, Schellhorn, 1989), which is quite common in German poverty research, and the new version of the so-called OECD scale, which is usually applied by Eurostat.<sup>11</sup> The OECD scale distinguishes adults and children (up to the age of 14) with weights of 1 for the household head, 0.5 for additional adults, and 0.3 for children. The BSHG scale reflects differences in the need of children of different age. The weights for the household head and additional adults equal 1 and 0.8 respectively, for children the weights are: 0.5 (0–6 years; 0.55 when living in a single parent household), 0.65 (7–13 years) and 0.9 (14–17 years). The weights of the OECD scale are lower, assuming higher economies of scale. The distributional effects compared to the BSHG scale are quite obvious: weighted per capita incomes or expenditures of large households are higher when using the OECD scale.

For the measurement of deprivation and standard of living no similar procedure is known. Thus, the analyses using the deprivation index are based on household scores.

### 3.4 Poverty Thresholds

Finally, we have to define how to distinguish the poor from the non-poor with these data. More formally, (equivalized) household income, (equivalized) expenditures, or (non-equivalized) deprivation constitute a rank ordering of all individuals in the sample and the question arises whether there is a qualitative change in their welfare if one goes down the ladder from high to low incomes (expenditures) or if one goes up from low to high deprivation. From a methodical point of view this equals the question whether it is adequate to dichotomize a continuous scale and, if so, where to put the dividing line. This difficult task will not be addressed here. Instead, we conceive our three indicators as ordinal rankings and we are interested in the question whether individuals in the lower ranks of these indicators show similar or different socio-demographic profiles according to the poverty risks discussed in section 2.2. We are not primarily interested in showing that these lower ranks form a qualitatively different state of welfare compared to the other ranks and, therefore, use some rather arbitrary statistical cri-

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<sup>11</sup> Equivalence scales based on extended linear expenditure systems (ELES; cf. Merz / Faik, 1995) seem to be another candidate. Analyzing expenditure data does not imply, however, that ELES scales have to be employed. From a practical point of view, they are just another kind of equivalence scale implying other, usually higher economies of scale than the ones discussed so far (Buhmann et al., 1988, Burkhauser et al., 1996, Faik, 1995). If we had used an ELES scale, the differences in poverty risks with respect to household type would be even less pronounced than the relatively low differences observed for the OECD-based income measure (cf. section 4.3).

teria to distinguish lower from upper ranks. For reasons of brevity, we call these lower ranks poor, but it should be remembered that it has not been demonstrated that they form a qualitatively distinct group. More specifically, we use 40, 50, and 60% of mean equivalized household income (expenditures, deprivation) as the dividing line for the income (expenditure, deprivation) indicator.

#### 4. Results

Before focusing on our research questions we have to demonstrate the validity of our indicators. Does the classical income indicator with our data yield similar results to other poverty analyses done for 1993 and 1996? Since the two direct indicators have not often been applied to German data, it is also necessary to show that they record individuals in precarious living situations usually termed poor. Therefore, we report some descriptive results on our three indicators before turning to the main question of how comparable these indicators measure poverty risks.

##### 4.1 Extent of Poverty in East and West Germany

Comparative research after German reunification has shown that the extent of income poverty in both parts of Germany depends on the reference distribution that is used to estimate mean equivalized household income.<sup>12</sup> If low West German incomes are compared to the West German mean and low East German incomes to the East German mean, income poverty is much lower in the East, because East Germans on the average earn less than West Germans. Besides that, one observes increasing poverty rates over time in the East, because income inequality increases with the economic transformation and the East German average income shifts upward. On the other hand, using an overall German average as the point of reference a contrary picture emerges: income poverty is much higher in East than in West Germany, now with a decreasing time trend as the average income gap between both parts of Germany diminishes.

Since we use the overall German average as the reference income, results which follow the later pattern can be observed in our data: income poverty is higher in East than in West Germany, but it decreases from 1993 to 1996.

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<sup>12</sup> See Andreß (1999) for a discussion of the relevant literature and further empirical results based on the GSOEP Poverty estimates using the EVS can be found in Hauser / Becker (2000) for 1993 and Hauser (1997a) for a comparison of 1993 and 1996, but these authors use a slightly different methodology (separate reference incomes for West and East Germany, old version of the OECD equivalence scale).

*Table 1*  
**Poverty rates 1993 and 1996 (in percent)**

Poverty line <sup>a</sup>	West Germany			East Germany		
	40%	50%	60%	40%	50%	60%
<b>Income</b>						
1993 BSHG scale	3.3	8.4	16.9	3.6	12.5	28.6
OECD scale	3.7	8.6	16.1	3.1	12.0	27.2
1996 BSHG scale	3.6	7.9	14.7	2.9	9.1	17.9
OECD scale	3.1	6.7	13.2	1.9	7.7	16.6
<b>Expenditure</b>						
1993 BSHG scale	2.2	6.8	14.9	3.4	12.0	25.0
OECD scale	1.7	5.9	13.3	2.5	9.7	22.1
Deprivation index <sup>b</sup> 1996	13.0	15.7	22.1	12.3	15.8	26.5

*Notes:* a) The overall German average was used as the reference income. To compensate for differences in purchasing power the incomes and expenditures in East Germany have been multiplied by the factor 1.127 in 1993 and 1.056 in 1996. b) Percentage of relevant items that are missing for financial reasons (see text for details).

*Source:* EVS 1993, n=39612 households (excluding foreign households), weighted to achieve a representative sample of individuals; SWB 1996, n = 3170 individuals, weighted results.

For example, in 1993 12% of the East German population, compared to 8.6% in the West, have an (OECD) equivalized household income less than half of the overall German average (see Table 1). By 1996 the East German figure has decreased to 7.7%, while only a small reduction (from 8.6 to 6.7%) can be observed for West Germany. Obviously, in a situation where geographic regions experience different economic changes it is difficult to portray a uniform picture of income poverty. Therefore, it may be interesting to compare the results based on this indirect poverty indicator with data on expenditures and standard of living.

In order to compare these results with our two direct indicators, we applied the same statistical criterion to distinguish the poor from the non-poor, i.e., 40, 50, and 60% of mean (equivalized) expenditure or mean (non-equivalized) deprivation. The indicator on expenditures yields about the same East-West differences as the income indicator, but in general poverty is slightly less frequent in both parts of Germany with data on expenditures than with data on incomes, especially when assuming rather high economies of scale (OECD scale).

Quite another picture is visible from the deprivation index: poverty seems to be much higher in 1996 and about the same in East and West Germany. According to the 50%-threshold, 15.8% of the East and 15.7% of the West Germans are (deprivation) poor. Using a certain percentage of the mean as the point of reference is, however, not a very meaningful strategy with our

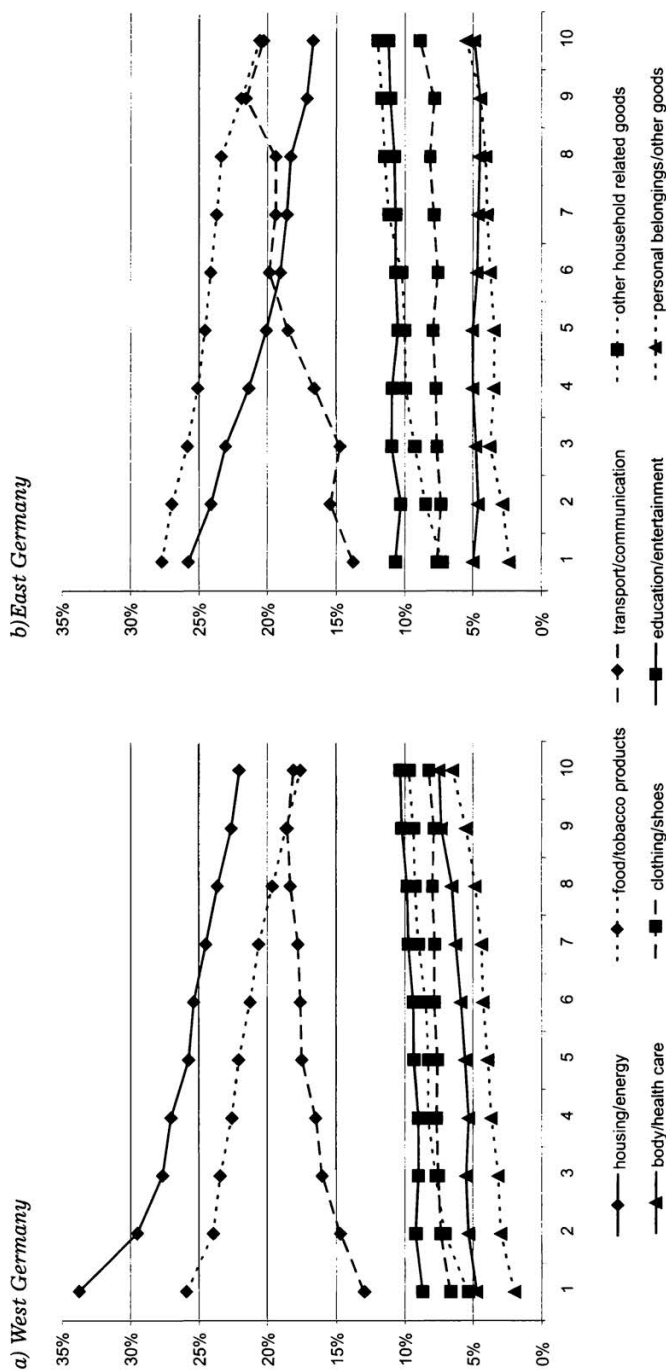
measure of deprivation. As explained in section 3.2.3, we determine living standards in the lower end of the distribution resulting in a distribution of deprivation scores which is severely skewed: 38,7% in East and 50,1% in West Germany show no deprivation at all and, in this respect, belong to the individuals with high living standards.<sup>13</sup> Consequently, average living standards are rather high and compared to this standard of reference more people are classified as (deprivation) poor. Therefore, this statistical criterion, when applied to our deprivation index, overstates the level of poverty. However, it is an interesting result that with respect to deprivation no East-West differences exist.

Before turning now to our research questions it may be interesting to see the expenditure and deprivation patterns of the poor. Figure 1 plots the share of expenditures for eight categories of goods and services by income deciles. In Figure 1a (West Germany) the resulting curves are almost monotone. The largest decrease occurs for „housing / energy“ and „food / tobacco products“. Both categories contain mainly goods that belong to the group of so called basic needs. They show clearly the pattern which is known as „Engel's law“: a decrease in the share of expenditures for basic needs with growing income. In contrast, the share of expenditures of all other categories of goods and services is increasing with higher income. Obviously, the need for basic goods is satisfied at a certain income level and, therefore, expenditures for these goods do not increase with higher income. In other words: the income elasticity of these goods is relatively low. Some figures might illustrate the differences. While in West Germany people in the lowest income decile, who are definitely poor, spend a third of their budget (33.8%) for „housing / energy“, this share strongly declines to 29.5% already in the second decile. All following changes are less marked. To a lesser extent this holds also true for „food / tobacco products“. The differences become even more pronounced when regarding the sum of both categories: The poorest in West Germany spend almost two thirds (63.3%) on housing and food, while the share in the highest decile is only 39.7%. Regarding the upper half of the income distribution one can observe that the most noticeable rise takes place in the category „personal belongings / other goods“, which contains a number of luxury goods like jewelry and watches. The results show that budgets are distributed differently along the income distribution and that economic strain, which is caused by expenditures for basic goods, is comparably high for the poorest.

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<sup>13</sup> Using the median as an alternative point of reference was no practical alternative since it is even more sensitive to a distribution with such a high percentage of zeros.





Notes: 1 equals lowest income decile.  
 Source: EVS 1993, n = 39612 households (excluding foreign households), weighted to achieve a representative sample of individuals.

Figure 1: Expenditure categories (in percent of total expenditure) by income deciles

The results for East Germany differ with regard to some specific aspects. First of all, the curves in Figure 1b are not as monotone as in the Figure 1a for West Germany, especially for „transport/communication“. This might be due to the smaller sample size or to relatively unstable consumption patterns in the East in the early 1990s. The second and even more important difference is the comparably low share of „housing/energy“ which reflects the low rents in East Germany. Third, the share of expenditures on „food/tobacco products“ is higher than in West Germany. Following the argumentation of Engel's law, this result indicates a generally lower standard of living in the East, because the share of the most basic goods is higher. This fits perfectly with the results on the extent of poverty which is higher in the East (see Table 1). Forth, the decrease in the share of „housing/energy“ and „food/tobacco products“ between the lowest and the second decile is less marked than in West Germany. Nevertheless, also in the East there are marked differences in the budget shares of the poor compared to the non-poor: e.g., the share of expenditures for „food/tobacco products“ and „housing/energy“ in the lowest and highest decile equals 53.5% and 37.3%. Fifth, in East Germany the share of expenditures for „other household related goods“ is higher and increases to a larger extent with higher incomes than in West Germany. This can be interpreted as a catch-up effect caused by the fact that a number of consumer goods were not or only hardly available in the former GDR.

Table 2 shows 9 items from our list of 35 living conditions and social activities. Some of these items were included in our deprivation index, because a majority of our respondents classified them as necessary, others not (see section 3.2.3).<sup>14</sup> We are now interested in the availability of these items across different levels of income and deprivation. The respective income groups are the highest quintile, the middle incomes and the income poor. Besides that, we distinguish between the non-deprived, the deprived who are not poor, and the deprivation poor (for further details see notes in Table 2). We find clear differences between all groups in East as well as in West Germany which confirm the validity of our measurement instrument. The availability drops for almost all items with increasing level of (total) deprivation and with decreasing income. The share of the poor who cannot afford the specific item is always significantly highest, except in the group of the income poor in East Germany (the two items „garden with terrace“ and „meal with meat“ are not significantly different). However, the last three columns of Table 2 also demonstrate that low income in East Germany is

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<sup>14</sup> This list is admittedly selective, but sufficient for illustrative purposes. We wanted to show that the poor cut back primarily on non-necessities (with respect to the majority rule), but also on necessary items most of us would call basic (nutrition, housing, health).

Table 2: Deprivation index

	Deprivation								Equivalent income (OECD)				
	West Germany		East Germany		West Germany		East Germany		West Germany		East Germany		
	low <sup>1</sup>	med-ium <sup>2</sup>	high <sup>3</sup>	low	med-ium	high	high <sup>4</sup>	med-ium <sup>5</sup>	poor <sup>6</sup>	high	med-ium	poor	
<i>Can not afford ... (in %)</i>													
to buy new furniture	3	23	71	7	26	68	5	18	47	11	24	44	
to buy new clothing	2	19	68	6	18	60	2	16	45	8	17	43	
to have a garden or terrace	2	10	40	3	5	16	6	9	16	6	5	11	
to go out every second week	1	13	52	3	12	46	4	10	31	5	10	34	
a videorecorder	0	7	36	0	4	26	2	7	18	1	4	21	
a meal with meat every second day <sup>7</sup>	-	4	43	-	3	11	2	4	22	1	3	5	
a car <sup>7</sup>	-	9	52	-	6	39	1	7	38	2	7	25	
to pay rent / mortgage w / o problems <sup>7</sup>	-	4	48	-	2	21	1	4	30	2	3	11	
additional medical treatments <sup>7</sup>	-	18	71	-	6	42	4	13	40	4	8	19	
N	991	840	148	456	567	155	325	1111	139	193	630	134	
Mean equivalent income in DM <sup>8</sup>	2633	2362	1541	2154	2140	1696	4088	2130	986	3240	1933	1106	
N	754	690	141	375	459	126	327	1115	143	194	632	134	

Notes: 1) Household lacks none of the relevant items for financial reasons (see text for details). 2) Household lacks at least one and up to 18.18% (East) or 27.27% (West) of the items for financial reasons. 3) Household lacks more than 18.18% (East) or 27.27% (West) of the items for financial reasons. 4) Upper quintile of income distribution. Quintiles calculated separately for East and West Germany. 5) Income is above the poverty line but below the upper quintile. 6) Income is below the poverty line. 7) Item is included in the deprivation index. 8) OECD scale.

Source: SWB 1996, n=3170 individuals, weighted results.

not as much connected with unaffordable items as it is observed for West Germany or as it happens with the deprivation poor in East Germany. Apparently, the correlation between income and deprivation is not that strong, especially in East Germany (see also the discussion in the following section).

With respect to our distinction between monetary and non-monetary goods it might be interesting to see the accessibility to public goods for the poor. Among our 35 items vocational training, neighborhood contact and the 4 job characteristics stand out as items individuals clearly cannot „buy“. In each case the income and the deprivation poor show a distinctly underprivileged position, having less education and contact and lacking healthy jobs with adequate pay and income security. But we also asked in the SWB for the availability of 7 infrastructural items in the vicinity of the home (children's garden, food shop, pharmacy, post office, bank, public transport, medical doctor). Surprisingly, these items did not correlate with poverty status (Lipsmeier, 2000) and we are not sure how to interpret this result. It may either indicate that in fact infrastructure and poverty are independent in Germany or it may be due to sampling procedures which failed to select individuals from poverty areas with deteriorated public infrastructure.

#### **4.2 Do Direct and Indirect Indicators Classify the Same Individuals as Poor?**

Determining the absolute level of poverty, however, is not our main interest. We want to know whether direct and indirect indicators classify the same individuals as poor. As a first step towards an answer we have compared the rank order on all three poverty indicators. Table 3 shows the deciles and quintiles<sup>15</sup> of both direct indicators' distribution, which are cross-tabulated with the deciles and quintiles of the indirect indicator's distribution. If the rank ordering is the same across the indicators, individuals in income decile *j* (quintile *j*) should be classified in the same decile *j* (quintile *j*) of the distribution of expenditures (deprivation scores). In other words, with perfect similarity we expect four tables that equal a diagonal matrix of 100's. The more the off-diagonal elements deviate from zero, the more dissimilarities exist between the indicators.

A first observation from Table 3 is the higher correlation between income and expenditure than the correlation between income and deprivation. In the table on expenditures the highest percentages per column (in bold face) can be found in or near the diagonal. No such clear pattern can be found for

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<sup>15</sup> Because of the skewed distribution of deprivation scores, quintiles had to be chosen for the deprivation index.

Table 3: Expenditure and standard of living by income

		expenditure decile <sup>a</sup>										deprivation index quintile <sup>b</sup>					
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	
<b>West Germany</b>																	
	1	53.3	20.5	11.6	6.4	3.8	2.1	0.8	0.6	0.7	0.2	1	44.1	24.8	7.0	13.1	-
	2	18.9	25.7	19.5	12.9	8.7	6.2	4.3	2.4	1.3	0.3	2	24.5	23.4	24.1	20.2	-
	3	11.7	16.0	19.1	16.7	13.2	9.1	6.1	4.1	3.1	1.0	3	13.4	21.4	14.1	27.7	-
	4	6.3	13.1	14.9	18.1	13.4	11.9	9.6	7.4	3.6	1.7	4	10.0	19.7	23.5	20.8	-
	5	3.8	9.2	12.3	14.7	14.2	14.4	12.6	8.3	6.8	3.7	5	8.0	10.6	31.4	24.2	-
	6	2.7	6.3	9.0	11.7	15.5	13.8	15.3	12.3	8.6	4.7						
	7	1.7	4.3	6.5	7.5	11.8	16.6	15.6	16.2	12.4	7.5						
	8	0.8	2.7	3.8	6.3	10.0	13.3	16.3	17.5	17.6	11.6						
	9	0.5	1.6	2.2	3.8	6.5	8.5	11.7	18.3	24.2	22.7						
	10	0.2	0.5	1.1	1.9	2.9	4.1	7.7	13.0	21.7	46.7						
<b>East Germany</b>																	
	1	43.9	22.3	10.7	8.8	6.3	3.6	1.2	1.3	1.7	0.4	1	40.9	18.0	17.3	0.0	15.6
	2	18.1	18.8	19.0	12.7	9.7	5.6	7.2	5.7	2.6	0.7	2	22.5	22.7	20.3	20.1	17.2
	3	13.1	17.6	14.1	13.0	13.2	11.6	7.5	5.2	3.2	1.6	3	14.5	20.8	20.1	16.5	25.9
	4	7.8	11.2	12.4	15.4	11.7	13.4	9.2	9.1	6.5	3.4	4	15.7	18.5	20.9	29.1	17.9
	5	6.2	9.4	11.2	12.8	12.3	13.1	11.0	10.9	6.1	6.9	5	6.3	20.0	21.5	34.3	23.3
	6	4.2	5.6	10.8	12.4	12.6	11.1	13.5	10.1	11.1	8.6						
	7	3.0	4.3	6.1	8.6	11.8	13.4	15.2	12.9	14.2	10.5						
	8	1.8	7.8	9.5	7.4	11.5	12.4	11.2	12.6	13.8	12.1						
	9	1.1	2.2	4.3	5.3	7.2	10.8	14.2	17.4	17.9	19.6						
	10	0.8	1.2	2.0	3.3	3.8	5.1	11.2	13.9	22.6	36.2						

Notes: a) 1 equals lowest expenditure or income decile (or quintile). b) 1 equals quintile with highest degree of deprivation.

Source: EVS 1993, n=39612 households (excluding foreign households), weighted to achieve a representative sample of individuals; SWB 1996, n=3170 individuals, weighted results.

the deprivation index. A second observation concerns the extremes of the distributions: 53.3% of the West Germans in the lowest income decile also belong to the lowest expenditure decile and, on the other end, 46.7% of the West Germans in the highest income decile also belong to the highest expenditure decile. These are by far the highest percentages in the table. The same is true for East Germans, although the figures are somewhat lower (43.9 and 36.2%, respectively). Therefore, one can speak of a rather high stability of the two measurements, at least at the extremes of the distribution (for a similar result using British data see McGregor / Borooah, 1991). Relative stability can also be observed in the lowest, but not the highest quintile of the deprivation index. 44.1% of the West Germans and 40.9% of the East Germans in the lowest income quintile also belong to the quintile with the highest deprivation scores. Since our measure of living standard focuses on the lower end of the distribution, this result could be expected. Finally, we observe that the correlation between direct and indirect measures in East Germany is generally lower than in West Germany. The maximum percentages in the East German tables are lower and the diagonal pattern cannot be observed to the same extent like in West Germany.

Before continuing with our analyses let us have a look at the dissimilarities between direct and indirect poverty indicators. They are especially pronounced for the deprivation index. Consider for example the fifth of the East Germans with the highest deprivation scores: 6.3% of them belong to the upper 20% with the highest incomes, 22% even to the upper 40%. Discrepancies also exist for the data on expenditures, but they are much lower: for example, 10.9% of the East Germans and 5.9% of the West Germans in the lowest expenditure decile have an income above the median. This again is just another example of the higher correlation between expenditure and income already observed above. The lower correlation between deprivation and income on the other hand may be, at least partly, a result of the skewness of the distribution of deprivation scores. The small sample size of the SWB (N=3,170) may have adverse effects too, producing less stable statistics compared to the EVS with its 75,747 individuals. But in general we conclude that the correlation between deprivation and income is lower than the correlation between expenditure and income. This confirms our hypothesis formulated in section 2.2: the more an indicator of living standards measures non-monetary goods and the more an indicator of resources measures household income, the less both indicators have in common.

### 4.3 Socio-Demographic Structure of Poverty Risks

The preceding section showed that individuals classified as poor by our three poverty indicators are only partly identical. This leads us to the ques-

tion: in what respect do these individuals differ? To answer this question, we will refer to the poverty risks discussed in section 2.2 and analyze the socio-demographic profiles of those individuals classified as poor by each poverty indicator. This requires a decision on the poverty threshold. We have seen in section 4.1 that our statistical criterion leads to different levels of poverty across our three indicators. Deprivation poverty was highest, followed by income poverty, and the lowest poverty rates were obtained by using expenditure data. Besides that, poverty decreased from 1993 to 1996, especially in East Germany. These differences in the absolute amount of poverty cause a problem for the following analysis: the socio-demographic profiles may be different simply because more people are classified as poor by indicator A than by indicator B. Therefore, to control for the effect of size in the following analysis, we have chosen thresholds for the SWB data from 1996 that yield similar overall poverty rates like the EVS data from 1993 using the 50%-threshold. More specifically, we have fixed the poverty rates based on the deprivation index in 1996 to 6.8% for West Germany and to 12.0% for East Germany (the respective German poverty rates based on BSHG equivalized expenditures in 1993; see Table 1). Similarly, we have fixed the poverty rates based on BSHG equivalized income for 1996 to 8.4% (West) and 12.5% (East). For OECD equivalized income the respective rates are 8.6% (West) and 12.0% (East).

The socio-demographic variables included in the following analysis are educational level, employment status, place of residence, and a multidimensional household typology based on household composition, age and gender of the household head. We have used multivariate logit models with effect coding to determine the effect of these variables on the (log) odds of being poor across different poverty indicators (income, expenditure, deprivation), time points (1993, 1996), and geographical regions (East, West Germany). Figures 2 and 3 give a comprehensive overview of the estimated logit coefficients.<sup>16</sup> Because of effect coding they can be interpreted as deviations from the average poverty risk at the given time point in East or West Germany. Therefore, data points in the positive (negative) region of the display indicate poverty risks above (below) the average.

Before discussing the differences between direct and indirect poverty indicators we want to give a general overview of the poverty risks observed in our two samples. In section 2.2 we have argued that, among other things, poverty risks change within the individual's life cycle. In fact, as our figures for different household types show, poverty risks are higher in younger and partly also in older age. For the age group „18–29 years“ the poverty risks

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<sup>16</sup> The estimated logit coefficients including test statistics for the 12 models are available from the authors on request.

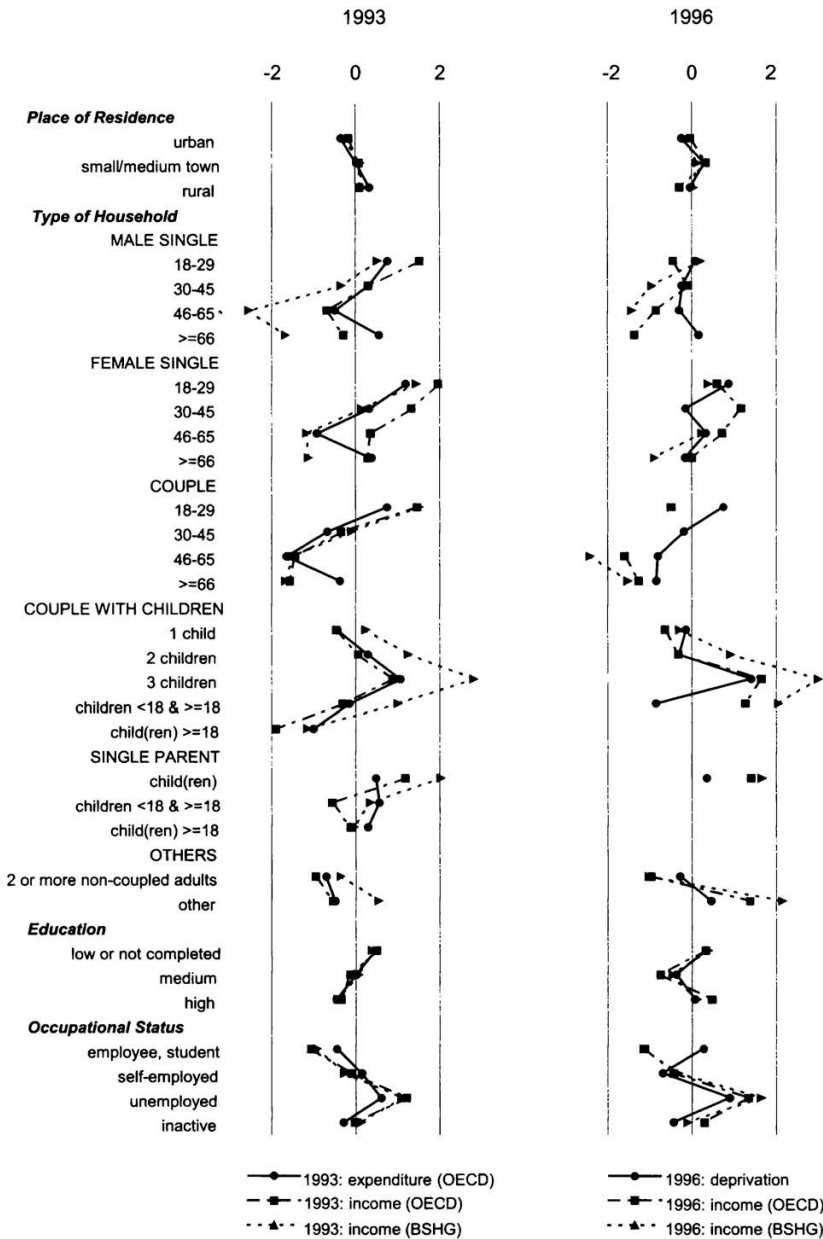


Figure 2: Sociodemographic structure of poverty risks (East Germany, logit coefficients)



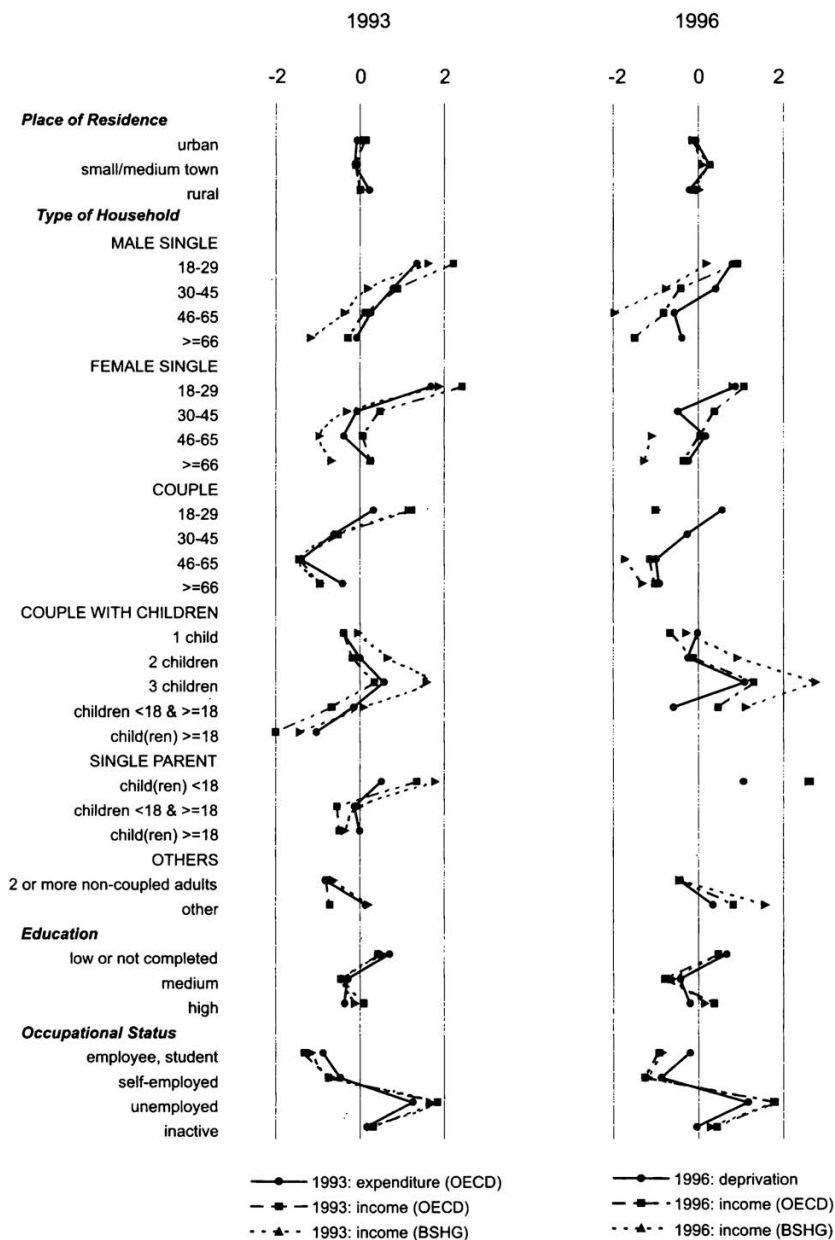


Figure 3: Sociodemographic structure of poverty risks (West Germany, logit coefficients)

are highest compared to other age groups. This holds true for singles as well as for couples. Also comparing couples with minor and major children underscores the tendency that with growing (family) age, expressed by the age of the children, poverty risks decrease. This confirms our hypothesis that especially the early stages of family life are more likely to be threatened by poverty. The age group „46–65 years“ bears the lowest risk of being poor.

Regarding couples with children another important mechanism becomes evident. Poverty risks are highly related to the number of dependent children in a household. While needs are rising with growing household size, time restrictions for gainful employment increase as well due to more extensive child care. The same argument applies to single parent households. Besides that, gender-related differences in poverty risks have to be considered for this group. The large majority of single parent households is headed by a female person. We have argued that women face additional poverty risks when a partnership breaks down due to the unequal gender-specific division of labor in households. The high poverty risks of single parent households confirm this hypothesis. But what about gender differences in general? In this respect our results are rather ambiguous. Although there is a tendency of higher poverty among women compared to men, this result does not come out very clearly. In contrast to our hypotheses, e.g., we cannot find unambiguous evidence for higher poverty risks of older women. The assumed disadvantages, lower pension rights because of shorter employment durations, do not appear in our data.

There is also no general effect of educational status, which we use as an indicator of the individual's earnings capacity. But it can be stated that people with low or incomplete education face relatively high poverty risks. The same applies to the unemployed. Exclusion on the labor market, which often implies dependency on transfer income, is clearly connected with a higher extent of poverty in this group. Compared to another group, the inactive, who rely to a broad extent on transfer income too, poverty risks of the unemployed are noticeably high. Regarding the active population we observe further differences. While employees have a relatively low risk of being poor, our results do not show a definite trend for the self-employed. But in general, there is the clear tendency that the active population faces lower poverty risks than the inactive population.

Finally, we comment on some of the regional differences. As could be expected, differences between rural and urban areas are less pronounced than the differences between East and West Germany. East-West differences appear predominantly for male singles and the unemployed. In West Germany poverty risks of male singles decrease almost linearly by age. In East Germany poverty risks of males do not follow a uniform pattern. The results for

1993 are approximately u-shaped with the lowest poverty risks for the middle age groups, while the results for 1996 show different trends depending on the indicator used. The results regarding occupational status can be interpreted in a more definite manner. In West Germany the distance, in terms of poverty risks, between the active and the inactive or unemployed population is much larger than in East Germany. Apart from these two main observations the socio-demographic structure of poverty risks in East and West Germany is rather similar. Especially the impact of household size and composition on the (log) odds of being poor can be observed in an almost uniform manner in both regions.

Although there is clear evidence for the existence of general patterns of poverty risks measured equally by each indicator, there are also specific poverty profiles which differ by indicator. At least two overall differences become evident from Figures 2 and 3. Firstly, the results obtained from both direct indicators (deprivation, expenditure) are much closer to the indirect indicator, if household income is equivalized according to the OECD scale. For the indicator based on expenditures this is not surprising, because expenditures have been equivalized with the same OECD scale. The similarities between deprivation and OECD-based income measures on the other hand may be due to the fact that deprivation has not been corrected for household size and this is more similar to assuming an equivalence scale with rather high economies of scale like the OECD scale. In any case, it results in rather strong deviations for the BSHG-weighted income indicator. Assuming rather low economies of scale like in the BSHG regulations yields a number of strong outliers: e.g., male singles in West Germany 1993 and large households in general. Secondly, due to different assumptions concerning economies of scale, the differences between the two income measures are mainly related to household size. For households of singles the BSHG-measure predicts constantly low, partly extremely low poverty risks. On the other hand, relatively high poverty risks are estimated for larger households. The OECD-based measure is less extreme in its results (for similar results see, e.g., Burkhauser et al., 1996, 20).

Let us now turn to the measurement characteristics of direct and indirect poverty indicators with respect to certain risk groups. On the one hand, we argued that some risk groups (younger individuals, families with small children, subgroups of the unemployed, one-parent families) score higher on expenditure than on income data, because they take credit on their future incomes. Therefore, these risk groups should show higher poverty risks on the income than on the expenditure indicator. Further, we assumed a similar difference for the self-employed, because incomes from self-employment may be only partly observed and therefore lower than expenditures in this group. Finally, we expected the opposite behavior for older people: high

poverty risks on the expenditure and comparatively low poverty risks on the income indicator, because older people consume less than their incomes except for specific needs (e.g., health care). Besides that, they presumably score relatively low on the deprivation index, because our index includes several goods that are accumulated over the life-course (e.g., consumer durables).

Our results on differences between expenditure and income measures (for comparison we take the OECD-weighted income) show the expected influence of age at least partly. When measuring poverty by expenditures, the younger have lower poverty risks compared to the income indicator. For the oldest age group the opposite can be observed. For couples with children no such clear pattern can be found. Especially families with minor children show almost no differences at all. Only in post-parental households we find the expected difference. These households have lower odds of being poor when poverty is measured by income. In contrast, our hypothesis on the differences between income and deprivation cannot be confirmed. The expected result that older households, due to life-long investments in household equipment, are less deprived than the income poor can only be observed for couples with major children. On the other hand, both the results for couples and singles do not confirm the hypothesis. Especially the estimates for male singles over 65 years deviate strongly from our expectations. In general, the results for male singles in this age group differ strongly across measures used in the analysis. Relatively strong differences can be observed also for women between 30 and 45 years, young couples and single parents. They can only partly be explained by our assumptions.

Rather ambiguous are the results for the self-employed and for employees. Neither show the estimates clearly whether self-employed or employees face higher poverty risks, nor can we find the expected differences between income and expenditure measures. The whole active labor force has the lowest (log) odds of being poor when the income indicator is used. The single exception are the self-employed in the East who face lower (log) odds of being deprivation poor. In contrast, there is clear evidence that the unemployed have lower (log) odds of being poor when expenditure instead of income is used as a poverty measure. For the unemployed it can be assumed that higher spending is due to credits on future and savings of past earnings. In sum, we can conclude that our hypotheses on differences between the measures by age, household composition, and employment status cannot be confirmed in general, but that some positive evidence was found.

## 5. Summary and Discussion

Individual welfare can be assessed from two directions: either directly by looking at the standard of living the individual has actually attained or indirectly by studying the resources available to the individual. However, both approaches are connected with specific conceptual and empirical problems. They indicate aspects of welfare, but it is unrealistic to expect that they contain no errors of measurement and that they grasp the same construct. Therefore, instead of (arbitrarily) selecting one single indicator for poverty analysis, we argued that different indicators for this rather complex construct should be thought of as complementary rather than competitive. As a step towards a better understanding we investigated the measurement characteristics of both direct and indirect poverty indicators. Since much comparative research has been done on different indicators of income poverty, we focused especially on (direct) measures of standard of living. Two types of data were available to us: data on expenditures, which need specialized and usually costly survey methodology, and data on living conditions and participation in social activities, which can be collected in routine population surveys.

Irrespective of the indicator and equivalence scale used, our analyses revealed a comparable set of poverty risk groups in Germany as in previous research based on income data. The u-shaped age pattern confirms the results in Frick et al. (2000) who also find the youngest and oldest groups to be more often affected by poverty compared to the middle age groups. However, there were no signs for above average poverty rates among the elderly, neither among women nor men. This result is in line with the many analyses showing a „normalization“ of poverty rates for the retired population (see Becker, 1997, Hauser, 1997a, 1997b). Higher poverty risks for women mainly stem from the higher risks of female single parents and the differences in younger age groups. Therefore, regarding the fact that loss of the partner as well as separation and divorce increase poverty risks (Frick et al., 2000), one can assume that female singles and the mainly female single parents suffer from the unequal distribution of the negative consequences of these events. Other studies found even stronger negative effects for single-parent households (Becker, 1997, Hauser, 1997a, Frick et al., 2000). The fact, that in our analyses poverty risks of single parents do not differ as extremely from those of other risk groups (e.g., couples with 3 and more children), can be regarded as a result of our multivariate analyses controlling factors like labor market inactivity which additionally affect single parent's poverty risks. There is clear evidence that labor market inactivity and especially unemployment (Hauser/Nolan, 2000) increase poverty risks and the comparison of bivariate and multivariate analyses

strengthens the assumption that these negative factors cumulate in certain groups of the population.

Our main interest were, however, possible dissimilarities between direct and indirect poverty indicators. As expected, the indicator based on expenditures (the money equivalent of the standard of living) showed a much higher compatibility with the income data than our measure of deprivation from a socially accepted „style of living“. The latter „agreed“ only in the lower ranks of the distribution with the income indicator. We conclude from this result that the proposed measure of deprivation is a good indicator to identify individuals that have a low standard of living because of few resources, especially because of low incomes. It is, however, an inadequate measure to identify other (higher) levels of welfare. Besides that, we observed some significant differences in the socio-demographic profiles of the individuals classed as poor by our three poverty indicators. Household size showed the largest differences, but to a large extent this could be explained by different assumptions on economies of scale implied by each indicator used in the analysis. Our other expectations with respect to age, specific occupational groups and household types could only partially be confirmed. When measuring poverty by expenditures, the younger had lower poverty risks compared to the income indicator. For the oldest age group the opposite could be observed. In contrast, our hypothesis on the differences between income and deprivation could not be confirmed. The hypothesis that older households, due to life-long investments in household equipment, are less deprived than the income poor could only be validated for couples with major children and was rejected for other household types. Similarly ambiguous were the results for the self-employed. There was, however, clear evidence that the unemployed have lower (log) odds of being poor when expenditure instead of income is used as a poverty measure. Therefore, it can be assumed that higher spending of the unemployed is due to credits on future and savings of past earnings.

This analysis has been a first step towards a better understanding of the differences and similarities in direct and indirect poverty measurement in Germany. However, our data sources were insufficient in several respects. First, there was no unique data set available that included all poverty indicators used in this analysis. Therefore, we had to combine data from two surveys that differed with respect to survey design, sample size, and sampling strategy. Although we made considerable efforts to establish a comparable data base, uncertainties remain and it is not quite clear whether our observations measure differences in poverty concepts or differences in data sources. Second, we would argue that indicators of expenditures and deprivation measure some sort of permanent income and capture much better the welfare position of individuals whose incomes either have changed

significantly or whose incomes cannot be assessed reliably. One of the reasons, why we could only partially confirm our hypotheses, may be that we only used cross-sectional data and/or failed to identify individuals with unreliable incomes. More research, preferably using longitudinal data, is needed to test this assumption. In any way, it has been demonstrated that direct indicators of standard of living are feasible; and as can be seen from our simple measure of deprivation: complicated and costly expenditure surveys are not a necessary prerequisite to undertake this task.<sup>17</sup>

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<sup>17</sup> Starting from 2001, the GSOEP will include several deprivation items making it possible to compare direct and indirect poverty indicators in a longitudinal perspective.

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## Appendix 1

### Necessary Standard of Living

The following items were classed as necessary by a majority of the SWB respondents and therefore included in the deprivation index.

#### *A (Items applying to all respondents)*

- Being able to pay for water, heating and electricity bills without problems.
- Home without damp walls.
- Sufficient heating in the cold season.
- Enough and healthy food.
- Being able to pay for rent / mortgage without problems.
- A bath or shower within the flat.
- A washing machine.
- On average one hot meal per day.
- Being able to afford medical care that is not fully covered by health insurance.
- Living in a house that is in good general condition.
- Completed vocational education.
- Financial reserves (e.g., savings, life insurance).
- Contact with people from the neighborhood.
- A telephone.
- Buying gifts for friends or relatives at least once a year.
- A color television.
- A hot meal with meat, poultry, or fish at least every other day.
- To live in a good living area.
- Generally paying more attention to the quality rather than the price of goods.
- Being able to afford a hobby.
- At least one vacation away from home for one week per year.
- A car.

#### *B (Items specific for households with children)*

- Toys and leisure equipment like bicycle, computer, or sports equipment.
- Separate bedroom for each child over the age of 10.
- Additional education like music, sports, or language lessons.
- Celebrate birthdays with many friends.

#### *C (Items specific for people who are employed)*

- A job that includes a sufficient pension scheme.
- A job without health risks.
- A job that is adequate for the personal level of qualification and paid accordingly.
- A secure job.