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A Comparison of the Main Household Income Surveys for Germany: EVS and SOEP

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1 Motivation

Description and analysis of the personal income distribution in Germany rely heavily on two major surveys, the EVS (Income and Consumption Survey) and the SOEP (Socio-Economic Panel Study). These surveys, however, do not deliver exactly the same results in terms of income levels and structure, as well as on inequality and poverty. Some of the discrepancies have led to confusions in the political debate following the first official Poverty and Wealth Report in Germany.[1] Thus, the purpose of this paper is to highlight the methodological differences between EVS and SOEP against the background of the recommendations of the "Canberra Group" (Expert Group on Household Income Statistics) and to give a comparison of some substantive results on the basis of both surveys. In describing and discussing systematically the features of the two major inquiries on household income, we aim to improve the understanding of differences in findings when measuring the German income distribution using SOEP and EVS, respectively.

[1] The Poverty and Wealth Report of the German Government draws on empirical results of both EVS and SOEP. Thus, discrepancies – which occur despite similar methodological approaches in the underlying studies – appear in a straight forward way. Moreover, another poverty report for Germany which has been edited by non-government organizations (Hans Böckler Stiftung, Deutscher Gewerkschaftsbund and Paritätischer Wohlfahrtsverband) and is based on the SOEP comes once more to divergent results. In this case, however, the findings on inequality and poverty differ from other SOEP based results mainly because of a different concept of income measurement, which is – in line with the British tradition of income measurement – based on monthly income instead of annual income. For a comparison of empirical differences between annual and monthly income figures cf. Krause and Habich (2000), Hanesch et al. (2000), and Göbel et al. (2002).

2 A first step towards a „Gold Standard" of measuring income distributions: Recommendations of the „Canberra Group"

2.1 Concepts[2] – a brief overview

Up to now there have been no international standards available for a proper measurement of the personal income distribution. Thus, it is helpful that recently a group of experts, which mainly consisted of official statisticians and researchers well known in the field of income distribution, which met for the first time in Canberra, discussed problems and possibilities of measuring household income. We start with an overview of some recommendations of this „Canberra Group" (CG). Although their recommendations are primarily devoted to the improvement of international comparability of income statistics, and, obviously, only a first step in defining a "gold standard" for the measurement of the personal income distribution, these guidelines serve as a general benchmark.

Income as a proxy for economic well-being can be conceptualized as a change in the net worth of wealth owned by a person between two points in time plus the value of consumption during this period. By this definition income is not just monetary income, but includes in-kind transfers and fringe benefits while consumption of goods produced at home is mostly neglected. One important item to be included is the rental value of owner occupied dwellings. In principle, unrealized and realized capital gains and losses should also be counted as income. But due to problems of surveying non-cash income components received from other units as well as capital gains and losses, the Canberra Group recommends as an initial step to deal with a concept reduced to just "cash or near cash" components coming nevertheless to a broad definition of income (CG 2001, p 18, Table 2.1). Given the practical problems of sampling and measurement of several items, however, the Group recommends an even smaller list of components as a minimum for the purpose of international comparisons. Table 2.1, based on Canberra Group's Tables 2.1, 4.1 and A1 in the Appendix (CG 2001, pp 18, 61, 115-132) and adapted to the institutional background in Germany by the inclusion of some further items, shows the components of total and disposable income. The items recommended by the Canberra Group for international comparisons are marked with an asterisk.

Although the Canberra Group refers only to total and disposable income, for analytical purposes and especially for understanding differences in empirical findings for Germany, three other concepts are integrated in Table 2.1: the concepts of "market income", "pre-government income" and net or "post-government income". The term market income is used synonym for all direct and immediate

[2] For a broader discussion of theoretical and methodological dimensions cf. Hauser and Wagner (2002) and the references which are given there.

Table 2.1. Components of total and disposable income

	1.	Cash wages and salaries (including employees' social insurance contributions)*
+	2.	Tips and bonuses, allowances paid for working on remote locations
+	3.	Profit sharing including stock options
+	4.	Severance and termination pay
+	5.	Goods and services provided to employees as part of compensation
+	6.	Income from self-employment, that is income of professionals and profits/losses from unincorporated enterprise (including income of farmers)*
+	7.	Goods and services produced for barter, less cost of inputs*
+	8.	Goods produced for home consumption, less cost of inputs*
+	9.	Income from owner occupied-dwellings (rental value less expenses)*
+	10.	Rentals (income from rentals less expenses)*
+	11.	Interest received less interest paid*
+	12.	Dividends*
+	13.	Royalties
+	14.	Employers social insurance contributions*
=		**Market income**
+	15.	Social insurance benefits from employers' schemes*
+	16.	Regular inter-household cash transfers received*
+	17.	Regular support received from non-profit-making institutions (e. g. charities)
=		**Pre-government income**
+	18.	Social insurance benefits in cash from government schemes*
+	19.	Universal social assistance benefits in cash from government*
+	20.	Means-tested social assistance benefits in cash from government*
=		**Total income***
-	21.	Employees' social insurance contributions*
-	22.	Employers social insurance contributions*
-	21.	Taxes on income*
-	22.	Taxes on wealth holdings
=		**Net income (post-government income)**
-	23.	Regular inter-household cash transfers paid
-	24.	Regular cash transfers to charities
=		**Disposable income***

* Recommended by Canberra Group

compensation for the input of productive factors (labor and capital) whereas pre-government income comprises also private transfers received including those re-

lated to former employment (item 15 in Table 2.1). Total income is defined as pre-government income plus public transfers, and net income results after deduction of compulsory (direct) levies. Although net or post-government income and disposable income are often used synonymously, a distinction remains because the latter is reduced by regular private transfers paid voluntarily or because of legal obligations (alimonies).

Following the recommendations of the Canberra Group capital gains/losses are – due to conceptual and practical issues – not included in Table 2.1. This component, however, should be kept in mind as a "memorandum item" of market income for optional analyses. Another complementary aspect has to be mentioned in this context. In addition to the components of pre-government income listed in Table 2.1, income analyses for Germany based on EVS and SOEP most often include another kind of private transfer: the receipts from privately effected life insurance contracts although they are hybrid payments consisting of interest and capital repayment. Neglecting these payments from the income concept would result in group-specific indicators of economic well-being, which in part are not comparable in a meaningful way – especially with regard to former self-employed and former employees. The deliberations of the Canberra Group with regard to income and the differences between concepts outlined above indicate that comparisons of research findings have to consider carefully the respective definitions.

Another crucial point is the accounting period. Income is often inquired as (current) monthly household net income but one calendar year is recommended by the Canberra Group. This is a compromise between an even better measurement of well-being by means of lifetime income on the one hand, and, on the other hand, the problem that no perfect income smoothing over the lifetime is possible – thus current income matters. Furthermore, practical issues of accounting and reporting income – especially from self-employment – give reason to take a reference period of one year.

Last but not least the statistical unit has to be defined appropriately. In contrast to the National Accounts, household income statistics do not cover non-profit organizations but only households and individuals. Given its main purpose of standardizing cross-national comparisons of household income, the recommendations of the Canberra Group on the definition of the unit "household" are rather soft. On the one hand, a household is defined as "a group of persons who reside together in the same dwelling" whereby a dwelling is "a structurally separate set of living premises with a private entrance from outside of the building or from a common hallway or stairway inside". This definition does not exclude all kinds of institutionalized persons and it does not make sure that all household members belong to a group of persons whose command over income is shared. The latter is important because the standardization of incomes of households with different size and composition by means of an equivalence scale – which is recommended as well (CG 2001, p 41) – presupposes the sharing of income. Thus, despite the fuzziness of the definition it seems that a household should be an "income sharing unit". But because income statistics are "most often concerned with the economic well-being of individuals and not with the well-being of households *per se*" (CG 2001, p 41),

the statistical unit of a household should be transformed to the units of analytical interest, the individuals within their respective household context. This transformation can be made by dividing household income by the sum of the equivalence weights of all household members, and by assigning the resulting net equivalent income to each household member. To measure inequality by various inequality indices persons have to be counted and the mean net equivalent income has to be calculated by dividing the sum of the individual net equivalent incomes by the number of persons. Analogously, the median and quantile measures have to be calculated.

2.2 From concepts to practice

The Canberra Group did not only identify guiding principles for obtaining "a true and fair picture of the distribution of income" (p 51) but also discussed various constraints that encounter in practice and – in several cases – how to handle these problems. The proposed turning of a conceptual definition of income into a working definition has already been identified in Table 2.1 in that components of the working definition are labeled with an asterisk. Further compromises have to be made because of imperfections and ambiguities in income data. One major problem is incomplete coverage of the population. Whereas homeless people are excluded from household surveys per definition[3] – which is a definite problem when analyzing poverty – this is not evident of people living in institutional accommodations[4]. There is no explicit recommendation of the Canberra Group that institutionalized persons should be excluded although it is clear that in most surveys they are not representatively covered (CG 2001, p 52). Even more important is the fact that for these people disposable income is not an adequate indicator of well-being. Comparisons with people living in private households, therefore, would be misleading.

Additional practical problems in surveying household incomes arise from some biases in the structure of the sampled population. Even in the theoretical case of perfect random sampling, due to limited sample sizes, "poor" and "rich" households and marginal groups in general are often not represented with case numbers which are sufficient for statistical inference. An even larger problem might stem from differential non-responses if government does not mandate the survey. In this case weighting is crucial. The optimal method must be decided case by case.

But even if the sample is fully representative with regard to the structure of private households, severe limitations may result from imperfections in the quality of answers – a problem of all surveys, even if they are mandatory. Inaccurate data must be presumed especially for questions on income from self-employment, from farming and from wealth holdings. Additionally, many respondents know little

[3] Although the definition of a household could be changed to include the homeless in practice it would be extremely difficult to cover this group in a survey.

[4] Barracks for armed forces, hostels for students or nurses or migrant workers, jails, hospitals, care/nursing homes for frail elderly or disabled people.

about how much they actually pay for taxes and social security contributions. Thus for some surveys, taxes and contributions are not surveyed but imputed by simulation of basic tax routines. However, it is most likely that this procedure yields underestimates of net income (post-government income) and disposable income, especially for high-income households who can make numerous tax deductions and who enjoy better chances for tax evasion (mostly in the case of income from capital and self-employment). Another point that deserves attention is the fact that in Germany as well as in some other countries, the membership in the social security institutions is mandatory only up to a certain income level or that the maximum contribution has an upper limit. In these cases for an unbiased comparison, even among households of the same country, an equivalent premium to cover the respective risks by private insurance should be deducted from disposable income for those households not covered by the mandatory social insurance.

There are no general rules on how to handle inaccurate data –not even in the case of extreme income outliers, which could be true but are not very likely – and with missing values due to item non-response. However, the Canberra Group recommends to report in detail on all editing rules and to compare structural survey results with administrative data (e.g. tax or benefit data) as well as grossed up micro data with national accounts aggregates (CG 2001, p 53).

A last point to be mentioned refers to possible biases in the revealed picture of income distribution due to price levels that differ between groups at a point in time as well as over time. As the Canberra Group emphasizes, it may be appropriate to adjust income data by relevant price indices, transforming nominal income to real income (CG 2001, p 42). But the experts also admit that this is a very difficult task and that official Consumer Price Indices may be inaccurate for several reasons (CG 2001, p 57). In Germany there are no statistics on regional price levels available, which would allow for a comparison of real incomes in different geographic areas. Still, with regard to socio-economic groups, price indices for two and four person households of employees and for households of retirees are published by the Federal Statistical Office; to our knowledge, they have not yet been used to adjust incomes in distribution analyses – possibly because the group-specific differences in price level are very moderate. In contrast discrepancies between East and West German prices after reunification have been all the greater – with the former far below the latter. Therefore, the German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung, DIW Berlin) has estimated price indices for the old and for the new Länder (cf. Krause and Habich 2000) in order to improve comparisons of the levels of real incomes, and to measure inequality correctly in case inequality measures are calculated on the basis of a joint distribution for united Germany. There is still some difference in the price levels (mainly due to cheaper housing in East Germany), but since the beginning of the new century this difference can be neglected (cf. Göbel et al. 2002).

3 Household income statistics in Germany: EVS and SOEP as the two main surveys

3.1 Some basic characteristics of EVS and SOEP

The most prominent official German survey dedicated to income and consumption is the "Income and Consumption Survey" (*Einkommens- und Verbrauchsstichprobe – EVS*) of the Federal Statistical Office (Statistisches Bundesamt or *Destatis*). This is a cross-section survey that started in 1962/63, and was repeated about every five years, that is in West Germany 1969, 1973, 1978, 1983, and 1988. In 1993 the survey was extended to East Germany and in 1998 it was repeated for all of Germany. Only since 1993 it does also sample persons living in households with a foreign head. In 1998 its size was 62.000 households, thus being the largest sample survey within the European Union. Because the EVS is not a random sample with mandated response but a quota sample with voluntary participation the annual Current Population Survey of Germany (*Mikrozensus - MZ*), which is a mandated random survey of large size (about 800.000 persons), serves as a benchmark for recruiting participants, and later on, for weighting the EVS sample according to three criteria for each federal state (type of household, social position of the reference person of the household, income bracket). The household net income brackets in the EVS are defined identically to those in the MZ. They are however, only used in the first interview of the EVS for the purpose of weighting the EVS households. The main surveying of income as well as questioning about all kinds of expenditures and wealth is done in three (in 1998 two) other parts of the EVS: the participants have to specify all income and expenditure components during the whole survey period – which was one calendar year until 1993 but in 1998 only three months – with various bookkeeping devices.[5] Only these income figures are used in analyses of the personal distribution of income.[6]

The Socio Economic Panel Study (*SOEP*) – the other major basis of income statistics in Germany – is an annual longitudinal survey under academic direction and was started in 1984 in West Germany. It is a stratified random sample[7] based on voluntary participation, and thus suffers from non-participation[8], which has to

[5] For detailed methodological information about the EVS 1993 and 1998 cf. Statistisches Bundesamt (1997 and 2002).

[6] Sub-samples of 80 % of the cases of the EVS 1993 and 1998 are available at a nominal fee for researchers in Germany (but up to now this is not available for researchers abroad). EVS sub-samples of 1973, 1978 and 1983 are available via the Luxembourg Income Study (LIS project) in Luxembourg.

[7] A master sample of the Association of the German Marketing Research Institutes (ADM) based on electoral registers is used for the starting addresses of the random route selection for Germans. The random sample of foreigners is based on the Official Register of Foreigners (*Ausländerzentralregister*).

[8] The initial non-response rate for the first interview was about 40 %. However it is likely that non-participation mostly follow a random process (cf. Schnell 1997). In fact, infor-

be compensated by weighting. Again, the MZ serves as the benchmark. Over the course of time further weighting was needed because of panel attrition. The original sample size was about 6.000 households with about 15.000 persons. After reunification, it was supplemented by an additional random sample for East Germany (realized in 1990). Further random sample extensions were realized in 1995 to cope with structural developments due to immigration and in 1998 and 2000 to allow for sample attrition and to get a larger sample size. As a result, overall SOEP sample size in 2001 for unified Germany was about 13,000 households with about 30,000 persons[9] – that is about twice the sample size for West Germany in 1984. The SOEP inquires income in alternative ways but – in contrast to the EVS – expenditures and savings are not covered in total and – up to now – wealth holdings were not covered in-depth. However, a major component of expenditures, housing costs, is covered. On the other hand, the questionnaire is broader than that of the EVS as it contains information about some topics in greater detail and especially a lot of subjective variables, respectively – for example about occupation, working hours, education and vocational training, contentment and apprehensions (concerns) – thus allowing much more sophisticated causal analyses than the EVS. Due to its unique longitudinal features and its easy data access[10], the SOEP is – at least in the international scientific community and in international organizations – more widely used than the EVS.

An overview of basic methodological differences is presented in Table A1 in the Appendix. Table A2 in the Appendix provides hypotheses about possible systematic effects – which are sometimes compensating in tendency – of these particularities of EVS and SOEP data on selected income distribution measures (income level, inequality, and poverty). In the following section some methodological aspects of EVS and SOEP, which seem to be most important for interpreting the respective empirical results on income distribution, are compared in more detail.

mation which was collected for non-participants show that this is the case (cf. Wagner et al. 1994, Däubler 2002).

[9] As far as the availability of individual events is concerned, for long-running panel studies the potential for information is cumulative. After 15 years, the SOEP can identify about 1,400 deaths, 1,100 relocations abroad (predominantly re-migration of immigrants) and around 10,000 completed episodes of unemployment. For a general description of the SOEP cf. Haisken-DeNew and Frick (2001).

[10] Within Germany 100 % of the cases of SOEP are available for scientific analyses. Due to data protection reasons only a sub-sample of 95 % (defined in a longitudinally consistent manner) is available outside Germany.

3.2 In-depth comparison of methodological issues

3.2.1 Population Coverage

The coverage of the population by sample surveys is restricted in many ways. First of all, it has to be kept in mind when analyzing poverty and social exclusion that the homeless are neither included in EVS nor in SOEP (as is the case with all other large samples all over the world). Furthermore, EVS covers by definition only private households thus neglecting individuals living in institutional accommodation. In SOEP institutionalized persons are covered in part, but not in a systematic manner: in the first waves these groups were surveyed by the interviewer just by accident, and in the course of the panel people who moved from a private household into an institution are followed up. Since the attrition rate of this group is rather high, it is better to exclude them from regular analyses with SOEP – moreover net or disposable income is a poor indicator of economic well-being for that group.

Apart from the exclusion of the above mentioned groups not living in (narrowly defined) private households – which is not in contrast to the recommendations of the Canberra Group – the SOEP sample in principle includes the entire resident population of Germany whereas the EVS has a further limitation. From 1962 to 1988 persons in households with a foreign head were not covered. Since 1993 the foreign population has been included, although the procedure does not yield representative results for this sub-group. Because of difficulties in recruiting and interviewing households headed by foreigners less integrated foreigners seem to be highly underrepresented[11]. SOEP, in contrast, includes an explicitly over sampled population of households headed by foreigners of the dominant five nationalities (Italy, Spain, Yugoslavia, Greece, Turkey) and questionnaires are translated into the main foreigner's native language, thus overcoming language barriers. Due to massive immigration into West Germany in the late 1980s and early 1990s coverage of this population worsened over time. In order to cope with this ongoing change in the population, the first (original) SOEP sample was supplemented by an additional random sample for immigrants, who moved to Germany after the initial sample was drawn (realized in 1995). This procedure aims at restoring representativity for cross-sectional analyses; however, the new immigrant sample can cause a break in the time series, since immigrants were not sufficiently represented in the first half of the 1990s (cf. Burkhauser et al. 1997).

Besides these specific restrictions on population coverage, further limitations of representativity arise for all sample surveys – as outlined in the conceptual chapter 2.2 – with regard to marginal groups, especially poor and rich households. One in-

[11] Cf. Pöschl (1993), p 388; Münnich and Illgen (2000), p 129. In 1993 only 786 foreign households (47% of the desired number) participated. In 1998 1,061 foreign households took part. But in weighing the sample households according to the MZ the Federal Statistical Office did not distinguish between German and foreign households. It should have been possible to calculate separate weights for this group, and thus to adjust for under representation.

dicator for coverage of the very bottom of the income scale is the number of social assistance recipients in relation to those counted in the respective official statistic – although the comparability is limited because the latter is a settling-day (key-date) statistic referring to the end of a year. EVS as well as SOEP comprise only about 60 % to 70 % of the registered benefit recipients in private households – it seems that SOEP does slightly better in this respect – and they comprise less than half of the respective aggregated transfers. With regard to the other end of the income range, the German Federal Statistical Office introduced top coding.[12] Some preliminary comparisons with income tax statistics indicate a considerable degree of under representation of high-income groups in the EVS[13]. SOEP has no exclusion threshold but households above the 35,000 DM line cannot be analyzed separately because there are only a few of them in the survey (around 10 cases per wave). Furthermore, both surveys score badly when aggregated income from self-employment and property income is compared with the National Accounts. The coverage in the various years of the surveys ranges between 60 % and 75 %[14]. Of course, this underreporting is a severe problem when compared to about 90 % coverage for wages and salaries. But this phenomenon is well known for all sample surveys. Partly this is an indicator for problems of surveying all incomes in a proper way; partly this is an indicator for problems of the National Accounts (Cf. Atkinson and Micklewright 1983).

Besides the common weakness of EVS and SOEP in representing the tails of the income distribution, small groups often cannot be analyzed in depth due to a large sample error (large confidence intervals). Indeed, this pertains less to EVS because one main advantage of this survey is the large sample size that makes it possible to derive stable results even for small population groups. Nevertheless, there are limitations.

3.2.2 Sampling and weighting

As mentioned before EVS and SOEP in theory differ fundamentally in the way of sampling. Because of high refusal rates of random samples in Germany – when survey participation is not mandated they increased from about 40% in the 1980s to 50% in the 1990s – EVS is constructed as a quota sample on the basis of the mandatory random sample of the MZ (see above chapter 3.1)[15]. The statistical of-

[12] The income thresholds for exclusion were monthly net household incomes of more than DEM 15,000 in 1973, DEM 20,000 in 1978, DEM 25,000 in 1983 and 1988, and DEM 35,000 in 1993 and 1998.

[13] Cf. Merz (2001), pp 99-105. Merz estimates that about 270,000 households with annual net income of about DM 100,000 or more are missing from the grossed up numbers of households. This is only partly caused by the use of a cut-off line.

[14] For the EVS see Hauser and Becker (2001), pp 55-60. For both surveys see also Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1998), pp 143.

[15] Cf. Kühnen (1999, 2001). In 1996 the Federal Statistical Office tested the random route method for EVS in five German federal states, which resulted in participation rates be-

fices of the German Federal States (*Bundesländer*) are advertising for participation in EVS in many ways – participants can earn a small honorarium[16]. The most successful recruiting method, however, seems to be to ask households who have already participated in other or former surveys (Cf. Pöschl 1993, p 387). Despite the various efforts, some of the quotas cannot be achieved so that a final weighting procedure has to be implemented[17].

In contrast, the SOEP is a random sample based on a standard random-walk procedure. Indeed, this is what statistical theory advises. However, non-response is significant and weighting is crucial. The weights of each first wave of each SOEP sub-sample are finally adjusted by means of demographic distributions – like EVS – but not by income strata, which are also used for calculation of quota and for weighting in EVS[18]. Over time, longitudinal weighting is necessary for SOEP due to differential attrition rates. In this procedure the income class is an important variable in addition to age, education, mobility and especially fieldwork events like the change of an interviewer. In order to make SOEP more easily comparable with official statistics the longitudinal weighting procedure is topped by some cross-sectional weighting by age brackets and the population share of foreigners[19].

One common aspect concerning the weighted results of both EVS and SOEP has to be mentioned. Whereas households are defined equally in EVS and SOEP – namely as income sharing units and thus meeting the recommendations of the Canberra Group – there are some differences to the respective definition of the MZ which is used as reference for weighting. In EVS and SOEP students who are living in dorms are most likely surveyed as members of their parents' households, whereas in MZ they are counted as households on their own[20].

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tween 9% and 15% only. This extremely high non-response rate may be due to the heavy burden on respondents in EVS due to detailed bookkeeping over a long period.

[16] The amount of this honorarium or remuneration is under the responsibility of the Federal States' statistical offices and is not uniform.

[17] Despite these weighting procedures it is probable that low-income groups and non-mainstream households are underrepresented because of the effort necessary to participate in the various bookkeeping exercises. For a methodological discussion of quota samples in general cf. Särndal et al. (1992).

[18] It is probable that the non-response rate of about 40 % for the first interview of the SOEP led to a selection bias toward the middle classes since German privacy law decries that each household has to agree in advance to be questioned again in the years to follow. This may have kept non-mainstream households from participating.

[19] The detailed weighting procedures of the SOEP are documented in a series of publications: For the last one which also quotes the underlying methods cf. Pannenberg (2001).

[20] It may be noted that due to different incentives for interviewers who must identify a "household" there is no unique official number and structure of households available in Germany. While in the census of 1987 interviewers were paid per dwelling, in the MZ they are paid per household. In the census this resulted in a reduced incentive to identify more than one household per flat, and, therefore, the number of one-person-households identified was several 100,000 households below that in MZ.

The quota sampling method of the EVS may be seen as a basic disadvantage of this survey[21], because it is not possible to calculate a sampling probability in a strict sense. Thus, statistical errors cannot be evaluated in a theoretically exact way. However, an exemplary calculation of confidence intervals at the 5 % level for the EVS based on the random selection assumption, thus only giving "inner bounds" of the confidence intervals, showed that the observed increase in the inequality of the personal income distribution between 1969 and 1993 was significant.[22] [23]

The theoretical shortcomings of quota sampling have to be seen in comparison to the practical problems of random samples (Cf. Krug et al. 1994, pp 46, 55). Both surveys have a selection bias that favors to some extent the middle-income groups. With the EVS, this happens despite quota sampling. To some extent it shows up in the willingness of social groups and household types to participate in the survey. With the SOEP there also exists a selection problem since the initial response rate of those persons randomly selected as original sample members was only about 60 %. This had to be corrected by a weighting procedure. Furthermore, panel attrition has to be corrected by a special weighting procedure using previous information of those who no longer want to participate (cf. Rendtel et al. 1995). Third, due to problems of covering immigration between 1984 and 1994 an additional weighting procedure was necessary to derive cross-section weights. Because SOEP is a stratified sample, and the attrition process can be interpreted as a further stratification, correct sample errors can be calculated by special procedures.[24]

The discussion of sampling methods has shown advantages and problems of both surveys. Even the recommendations of the Canberra Group are cautious and indirect in this respect. To be sure the experts have primarily random sampling in mind as they propose that households should be weighted inversely to their probability of selection (CG 2001, p 41). But on the other side, they do not take a strict position when they recommend that "the analyst should use all of the available evidence in making their judgments about which series, sets of series, or combinations of series produce the most reliable estimates" (CG 2001, p 77).

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[21] In principle it would be possible to improve the weighting procedure of the EVS by using more criteria that are contained both in the MZ and in the EVS.

[22] Cf. Becker (1995), pp 20-22, and Hauser (1999), p 101, footnote 31. It should be possible to calculate approximate outer bounds of a confidence interval assuming an extreme selection bias of the participants, given the restrictions for the selection by quotas based on the MZ. But these outer bounds have not yet been calculated.

[23] In any case "statistical significance (is) not the only yardstick by which the importance of a change over time in income distribution should be judged. The end user ultimately has to use their own judgment about the policy significance of any observed changes " (Canberra Group 2001, p 77).

[24] For the "random group approach" cf. Rendtel (1995).

3.2.3 Approaches to income recording

The EVS consists of several elements: First, there is an initial household interview during which basic household (demographic) information, including net income of the household (in brackets) which serves as one of the weighting variables to adjust the sample to the population structure yielded by MZ, is gathered. Second, a household book has to be kept for the whole survey period during which all kinds of income and expenditure items have to be noted continuously as part of predefined categories as well as changes during the period with respect to household composition and employment status. Third, a sub sample of 20 % of the participating households has to keep another household book for one month in which all expenditures on food, drinks, tobacco and tobacco products have to be noted in more detail (approximately 100 categories). Finally, until 1993 a final interview was conducted with questions focusing especially on financial assets and debts. In 1998 these questions were integrated into the device for continuous bookkeeping whereas real estate is queried in the initial household interview. Information on all household members is gathered from the person running the household budget but proxy interviews are allowed. In 1998 the sample was split into four parts with a rotating bookkeeping period of three months each in order to reduce the load on the respondents. This change poses some problems of comparability with former results (see section 3.2.4)[25]. The approach of bookkeeping on incomes as well as on expenditures has several advantages, not only a probably high degree of data accuracy but also the implicit gathering of savings and the possibility to analyze distribution of economic well-being and poverty by the alternative indicator of expenditures. Additionally, consistency between income and expenditure sums (including changes in net wealth) can be checked.

SOEP on the other hand has the advantage of inquiring income in alternative ways, which in addition to the longitudinal character of the data, also offers some possibilities to check the accuracy and plausibility of responses. First, the head of the household – defined by the household members as the person who knows best about the general economic conditions of the household – has to declare the household's total net income for the survey month (income screener). This of course is only quite a rough estimate of "normal" income but best comparable with the income information of the MZ and of the first interview of the EVS (see Figure A1 in the Appendix). Second, since 1995 major income categories received in the current month are queried (income components per month), and finally, a calendar of income receipts during the previous year is gathered (annual income components)[26]. For the latter two concepts – as for other variables – each household member aged 16 and older is surveyed; proxy interviews are not allowed be-

[25] A more detailed description of these problems as well as some possibilities on how to correct for them are sketched in Hauser and Becker (2001), pp 46-60.

[26] For East Germany, however, annual incomes are not calculated for income years 1989 and 1990 because due to the rapid transition process during those years these figures would be misleading. Additionally, until June 30, 1990, the day before the "currency union" (*Währungsunion*) was concluded, a different currency (Mark of the German Democratic Republic) was in use.

cause subjective indicators are inquired as well. As some household members may refuse to give information the resulting problem of unit-non-response may yield some underestimation of household income.

3.2.4 Income definition and coverage of components

Comparable income concepts

Some of the confusion surrounding diverging results of EVS and SOEP comes from the comparison of findings based on different income concepts, especially those of the EVS based on detailed income recording with those of the SOEP based on the so called income screener which is measuring current monthly income of a household. In order to exclude this kind of methodological "noise" from the comparison we concentrate in the following on annual income[27]. In principle, the variables of EVS and SOEP cover similarly the definitions of market, pre-government, total and net (post-government) income outlined in Table 2.1. In practical terms EVS includes more details than SOEP, where some income components are only implicitly comprised in aggregates, but some minor components in fact are not considered at all. In general, with respect to this issue EVS meets the recommendation of the Canberra Group more completely than SOEP.

One critical point remains which is caused by a specialty of the German social insurance system: since public health and care insurance is mandatory only for employees up to a certain income threshold (in 1998: 6,300 DM and 5,250 DM per month in West and East Germany, respectively; in 2002: 3,375 € per month) net (post-government) income for voluntarily insured employees above that threshold includes the contributions paid. Thus, the indicator of net income is of limited significance not only when comparing households of employees with those of self-employed but also with regard to the heterogeneous group of employees. Neither EVS based nor SOEP based analyses have yet corrected net income by an equivalent premium to cover the respective risks with private insurance companies, which would ensure an unbiased comparison of households with and without mandatory social health insurance membership. Additionally, employers' social insurance contributions, which in the case of compulsory insurance are paid directly to the system, and thus are not shown on the individual pay-sheets, are neither covered by the EVS nor by the SOEP. This means that there is a difference as against the concepts of "market income", "pre-government income" and "total income" defined by the Canberra Group in Table 2.1. Studies based on EVS or SOEP data generally exclude mandatory employers' contributions to the various branches of the German social security system. In some cases of voluntary insurance employers' pay is part of the premium which is then included in cash in-

[27] Figure A1 in the Appendix shows a comparison of results on monthly income as given by the screener information of SOEP with the information on income brackets given in the MZ and in the starting interview of the EVS. Excluding households with item non-response and those with their main income coming from agriculture there is not a great difference between the three distributions.

come. Thus there is a further ambiguity in income definition[28]. EVS based time series on income and inequality normally do not correct for this feature because the data available do not always show that special component of cash wages and salaries separately. Only the most recent data of 1998 allow the exclusion of employers' contributions to voluntary health and care insurance from cash wages and salaries; this results in a reduction of mean labor income of about 50 DM per month in West Germany and about 20 DM per month in East Germany. In the SOEP survey employers' contributions to voluntary social insurance are not covered by the questionnaire, but it is not clear whether all respondents stick to this rule. Thus the income concept is not completely comparable with that of EVS.

Accounting period

With the accounting period of one year both EVS and SOEP meet the recommendations of the Canberra Group. But as mentioned above (chapter 3.2.3), there remains a significant practical difference in that EVS households keep a "household book" during the response period, whereas SOEP household members give the figures for their various incomes retrospectively for the previous calendar year. Thus measurement error is most likely larger in SOEP than in EVS. In addition to this, only persons who are household members at the time of the interview answer to the retrospective questions about last year's income. The incomes of persons who were household members during the previous year but had left the household prior to the interview are not registered. In EVS a similar problem shows up when the size, the type and the employment status of households has to be determined. These categories are defined by taking those members into account who were predominantly living in the household during the reference period and by taking the status they predominately had.

A critical point of EVS data is the methodological change of the survey in 1998 by splitting the overall sample into four sub-samples (see chapter 3.2.3)[29]. Whereas till 1993 the survey households were filling in a "diary" for all of the twelve months of a year (response period was equal to the accounting period), since 1998 they report just for one quarter of a year. Indeed, because of rotation the survey period still covers one year, but the individual accounting period now is reduced to three months thus not complying with the respective recommendation of the Canberra Group. This change ceteris paribus increases measured inequality because income that is not paid continuously like Christmas gratifications, dividends and interest, can no longer be surveyed for all households. Thus, comparability with results of former surveys is restricted. Another problem arises with an implicit change in the definition of demographic characteristics of the household

[28] There is a similar problem with a group of civil servants (Beamte) who do not pay social security contributions but have to cover about half of their health costs by private insurance.

[29] The reasons were to reduce the burden of bookkeeping for the respondents and the speeding up of the editing process to be able to release the edited data with less delay. Although the Federal Statistical Office inquired users of this survey about the desirability of this change, in hindsight it poses many problems.

(as mentioned above). Since the response period changed from one year to three months this must have resulted in a different classification of some households, which again reduces comparability over time. However, some analyses of the EVS 1998 – comparing quarterly results with results based on the accumulated data for all periods – showed that these effects on overall distributional results are rather small. Nevertheless, some disaggregated figures of income distribution may be biased by the new rotation principle in the survey. Therefore, the EVS findings to which we refer in the following are based on calculations of inequality indicators per sub-sample, and then the average of the quarterly results is taken (Cf. Hauser and Becker 2001, pp 50-53).

Missing values and imputations

Missing values and data inaccuracy pose great problems to any household income survey. According to their respective questionnaires, the possible ways to come to grips with these problems are different for EVS and SOEP. Since expenditure and income components are both measured by the EVS there exists an internal check, which is used for editing and refining the raw data. Imputations are applied to EVS by staff-experts, but the method is only a long time after release of the data publicly documented[30], and revised income components are not flagged. In case the sum of expenditures is not equal to the sum of incomes, withdrawal from savings-accounts and cash flow from the sale of assets (dissaving), the difference is shown in the variable "statistical difference", which in most cases is rather small. Severe problems of comparability over time, however, result when imputation routines change. For example, up to 1993, comparing with reports of financial assets controlled the recorded interest incomes but this was not done with 1998 data.

In contrast to the released data of EVS, in the SOEP database all imputed incomes are flagged. The missing values are estimated by means of the "row-and-column method" as suggested by Little and Su 1989. This imputation algorithm relies on cross-sectional as well as longitudinal information[31].

Since income data of the EVS is top-coded (see chapter 3.2.1) high-income households are excluded. Annual income information in the original SOEP micro-data is neither top- nor bottom-coded. Decisions about trimming are up to the researcher who is analyzing the data. For results given below we apply a 1% bottom coding for post-government income in SOEP but not in EVS. However, due to the expert editing of the latter missing income data are adjusted to expenditure data so that extremely small net incomes are avoided.

Imputed Rents

Imputed rent as major non-cash income to be included in total income has been defined by the Canberra Group as "rental value less expenses". For EVS imputed rent of owner-occupied dwellings is derived from actual rent payments by tenants

[30] A documentation of the methodological aspects of the 1998 survey will be published in the third quarter of 2002 (Statistisches Bundesamt 2002).

[31] Cf. Butrica (1996) for the application of the method to the SOEP.

of comparable flats and houses, differentiated by several criteria, and maintenance costs etc. are deducted. However, the cost of financing, especially interest on mortgages, is not deducted. Thus, EVS only partly complies with the Canberra Group's recommendation[32].

SOEP-information on imputed rental value of owner-occupied housing is based on the so called Opportunity Cost Approach. Estimating a fictitious market rent for owner-occupiers by means of a regression model and deducting owner-specific costs for taxation, maintenance and operating costs as well as interest on mortgages yields a net value of imputed rent (cf. Frick and Grabka 2001). This is considered to be the appropriate definition of the income advantage of owner-occupiers according to the Canberra Group's recommendations.

Measuring Taxes and social security contributions

The last major distinguishing feature of the two surveys, which should be mentioned here, is the coverage of levies. In EVS, information about direct taxes and social security contributions of employees is sampled whereas in SOEP this information is not directly surveyed. The difference is caused by the particular interviewing methods as described in chapter 3.2.3. EVS respondents are filling in a detailed "household book" which covers incomes and expenditures. In such a framework it is possible to sample information on taxes and social security contributions whereas retrospective questions on this topic seem to yield less reliable results. However, a notable shortcoming of the EVS is that the survey records current tax payments while a considerable number of tax payers get tax repayments and others may have to pay additional amounts based on the final tax declaration, which is filed in the following year. Since the records of these tax repayments or additional payments – if covered at all – cannot be attributed to a specific year they are often neglected in the analysis of the personal distribution of income of the respective year. In sum this presumably leads to a slight overestimation of tax payments and, correspondingly, to an underestimate of post government income and disposable income. It is hard to know whether this accounting problem has a significant impact in the distribution of net incomes.

With the SOEP, income taxes and social security contributions of employees are simulated (cf. Schwarze 1995). It is a straightforward task to simulate social security contributions which follow rather simple rules. However, simulation of

[32] However, the EVS procedure makes sense when taking a long-run perspective of 25 years or more. During this period mortgages are typically paid back, and – according to the experience of the past century – high but unrealized capital gains are to be expected since the value of houses and land increases by more than the price level of consumption goods. Only by using this long-run perspective it is rational to buy a house or an apartment, because during the first ten years upkeep and interest on mortgages usually are higher than the gross rental value of the property, even when taking tax subsidies into account. Deducting interest on mortgages from the gross rental value of an owner occupied dwelling, therefore, would underestimate the position of young homeowners in relation to the situation of older homeowners. Obviously, the Canberra Group takes a different view.

income taxes is clearly more complicated, especially for households of farmers and self-employed persons and for all households with income from capital. The simulation cannot cover all tax deductions that taxpayers might be eligible for because this information is not available, and thus the procedure overestimates especially income tax of high-income households. This means that the level of post-government income and disposable income is most likely downward biased in SOEP, and thus inequality of net incomes is most likely underestimated (cf. Table A2 in the Appendix).

3.3 Some results of income distribution analyses on the basis of EVS and SOEP

We now come to the final question about the effects of the differences in the methodological approaches on empirical findings. For the comparison of the results of income distribution analyses on the basis of EVS and SOEP we calculated equivalent incomes using the old OECD equivalence scale[33]. We distinguish between the levels of market income and post-government (net) income (see Table 2.1 in chapter 2.1) and display for both income concepts average incomes (mean and median). For measuring inequality we apply two indicators: Gini coefficient and poverty head count ratio on the basis of a poverty line at 50 percent of mean equivalent net income. All results are shown on income years, which for EVS are the same as the survey years, but for SOEP are the years preceding the survey years. We distinguish between West and East Germany (also in the calculation of poverty lines) but do not show results for overall Germany because these would have to rely on assumptions concerning the price levels in both parts of Germany.

Due to missing or incomplete coverage of foreigners in the EVS, we concentrate on figures which are based only on households with German heads, whereas for SOEP we discuss results for all private households as well as for German households[34]. By doing so, we can separate the impact of foreign residents on the German income distribution. As poverty rates differ whether one uses the mean for the total population or the mean only for the German population the SOEP results for West Germany consequently are based on two different poverty lines: according to the population coverage we show poverty head count ratios that relate to poverty lines given on the basis of the total population and the German population, respectively.

We can compare only the years which are covered by both EVS (1983, 1988, 1993 and 1998) and SOEP. However, to fully exploit the potential of the SOEP we also present results for the intermediate years in order to give an impression on

[33] This scale assigns a weight of 1.0 to the first adult of a household, weights of 0.7 to additional household members 15 years and older, and weights of 0.5 to younger children. It has been shown that the old OECD scale corresponds quite well to the scale implied in the German social protection system; cf. Faik (1997).

[34] For SOEP results, which include institutionalized persons as well as a crude estimate of the impact of homeless persons on the income distribution cf. Frick et al. (1997).

Table 3.1. Market Income[a]: Mean, Median, and Gini Coefficient

	Mean [DEM p.a.]				Median [DEM p.a.]				Gini coefficient			
	SOEP[b]			EVS	SOEP[b]			EVS	SOEP[b]			EVS
	West Germany - entire population[c]											
1983	(18,271)	19,332	(20,434)	-	(16,296)	17,074	(17,661)		(0.4325)	0.4640	(0.4794)	-
1984		19,835				17,458				0.4656		
1985		20,429				18,402				0.4525		
1986		21,572				19,297				0.4473		
1987		22,037				19,645				0.4479		
1988	(22,576)	23,099	(24,051)	-	(20,573)	21,150	(21,511)		(0.4364)	0.4466	(0.4566)	-
1989		24,912				21,710				0.4451		
1990		25,332				23,018				0.4357		
1991		26,947				24,107				0.4413		
1992		28,219				24,710				0.4498		
1993	(27,174)	28,864	(29,575)	31,592	(24,435)	24,586	(25,059)	27,466	(0.4426)	0.4581	(0.4748)	0.4422
1994		29,265				25,200				0.4685		
1995		30,841				26,672				0.4660		
1996		30,356				25,565				0.4743		
1997		30,865				26,339				0.4763		
1998	(29,449)	31,260	(33,860)	34,306	(25,523)	26,273	(28,201)	29,740	(0.4532)	0.4778	(0.4976)	0.4444
1999		35,406				28,719				0.4942		
	West Germany - only German population[c]											
1983	(18,277)	19,388	(20,502)	20,976	(16,331)	17,074	(17,871)	19,133	(0.4390)	0.4736	(0.4935)	0.4301
1984		19,919				17,463				0.4759		
1985		20,532				18,462				0.4623		
1986		21,718				19,310				0.4564		
1987		22,149				19,700				0.4571		
1988	(22,973)	23,228	(23,987)	23,444	(20,482)	21,238	(21,916)	21,222	(0.4462)	0.4570	(0.4669)	0.4503
1989		25,141				21,901				0.4555		
1990		25,588				23,375				0.4470		

Table 3.1. (cont.)

1991		27,265				24,447				0.4524		
1992		28,606				25,059				0.4630		
1993	(27,006)	29,469	(30,661)	31,718	(24,037)	24,945	(26,990)	27,609	(0.4524)	0.4862	(0.4851)	0.4425
1994		29,678				25,453				0.4750		
1995		31,666				27,619				0.4704		
1996		31,166				26,704				0.4783		
1997		31,448				27,023				0.4842		
1998	(29,112)	31,744	(34,014)	34,580	(25,539)	26,837	(29,738)	30,094	(0.4535)	0.4826	(0.4936)	0.4435
1999		36,163				29,716				0.5002		
	East Germany - entire population[c]											
1991		14,699				14,419				0.3964		
1992		17,646				16,300				0.4189		
1993	(18,954)	19,890	(20,626)	18,536	(15,225)	18,264	(19,682)	16,770	(0.4063)	0.4476	(0.4695)	0.4678
1994		21,072				19,461				0.4505		
1995		21,197				19,164				0.4637		
1996		22,011				19,185				0.4796		
1997		22,049				19,125				0.4878		
1998	(20,222)	21,648	(23,412)	23,071	(17,780)	19,039	(21,500)	20,627	(0.4696)	0.4993	(0.5265)	0.4822
1999		22,850				19,626				0.5046		

[a] Income Basis: In the SOEP, annual incomes are collected every year in springtime for the preceding year, in the EVS by continuous book-keeping during a year (until 1993) and a quarter of a year (1998), respectively (both concepts including imputed rent for owner-occupied housing). In SOEP, incomes are corrected by 1% bottom-coding; furthermore, as with EVS, post-government incomes of zero are excluded from the analysis.
Equivalence scale: former OECD scale (the household head is weighted by 1.0; further household members older than 14 years are weighted by 0.7, children up to the age of 14 by 0.5)

[b] Values in brackets: lower and upper bound, respectively, of the 93%-confidence interval.

[c] Population: persons in private households; in the SOEP "German households" are defined as households without foreign members older than 15 years, in the EVS the definition refers to the nationality of the household head. SOEP results for 1993 are calculated without sample D (immigrants), 1997 without sample E (supplementary sample to compensate panel attrition)

how income distribution developed on a yearly basis instead of five-year intervals.

Providing information on the significance of our findings, 93 %-confidence intervals for the SOEP results are given[35]. Table 3.1 displays results for market incomes. Except for 1988, mean and median incomes are higher in EVS than in SOEP; in 1988 the amounts are nearly the same. The somewhat higher income levels in the EVS can be attributed to methodological differences:

With the bookkeeping approach of EVS income probably is sampled more completely than with the retrospective questions of SOEP, and – with the exception of 1998 when only quarterly incomes are gathered – capital incomes are queried more precisely than with SOEP. The EVS does not deduct interest on mortgages when calculating imputed rent.

Again with the exception of 1988, market income inequality is higher in the SOEP data than in the EVS data. Perhaps quota sampling induces a more distinct bias towards the middle classes than random sampling. On the other side, EVS is probably less biased by outliers due to inaccurate data – an advantage of the intensive editing based on a comparison of income declared and expenditures made.

Looking at the time series of inequality of market income (Table 3.1) somewhat contrary trends arise regarding the German population in West Germany. From the 1980s to the early 1990s, according to SOEP, there is a u-shaped development of the Gini coefficient compared to an inverted u-shape resulting from EVS data. However, the differences are moderate and for the late 1990s both surveys indicate no change of market income inequality. In addition to these comparisons at five-year intervals, the SOEP allows a look at the short-run impacts of the business cycle. As could be expected, the boom in West Germany at the end of the 1980s was accompanied by a decrease of market income inequality from 1984 to 1990.

Turning to market income in East Germany (bottom panel of Table 3.1) both EVS and SOEP show a substantial increase in mean and median income. This effect was to be expected since it is caused by much higher increases in wages in East Germany compared to West Germany, and probably also by an increasing relevance of capital income in East Germany. But not only the income levels but also inequality of market incomes grew substantially in East Germany as is shown by both surveys. The main reason seems to be increasing unemployment after unification but the inequality of the distribution of wages and salaries among those gainfully employed also increased during the 1990s in East Germany (Cf. Hauser and Becker 2001, p 98).

Table 3.2 displays results for post-government (net) incomes. Again the EVS means and medians are statistically significantly higher than the respective SOEP figures. Given that the difference between the market income figures was smaller, this additional difference may be caused by the taxation routines employed in the SOEP that overestimate tax payments.

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[35] Based on a "random group approach" which properly takes into account the SOEP sampling rules as well as any kind of non-response; cf. Rendtel (1995).

Table 3.2. Post Government Income[a]: Mean and Median [DEM p.a.]

	Mean				Median			
	SOEP[b]			EVS	SOEP[b]			EVS
	West Germany - entire population[c]							
1983	(16,976)	17,545	(18,041)	-	(14,934)	15,525	(16,071)	-
1984		17,705				15,832		
1985		18,227				16,470		
1986		19,393				17,314		
1987		19,863				17,652		
1988	(20,304)	20,677	(21,190)	-	(18,155)	18,553	(18,882)	-
1989		21,771				19,275		
1990		22,807				20,142		
1991		24,017				21,493		
1992		25,059				22,492		
1993	(24,933)	25,851	(26,959)	31,564	(22,069)	22,722	(23,597)	27,751
1994		26,327				23,481		
1995		26,727				23,702		
1996		26,915				23,985		
1997		27,595				24,256		
1998	(26,759)	28,206	(29,425)	34,764	(24,357)	25,031	(26,132)	30,624
1999		31,854				26,931		
	West Germany - only German population[c]							
1983	(17,154)	17,803	(18,352)	21,072	(15,125)	15,730	(16,112)	18,828
1984		17,981				15,987		
1985		18,521				16,690		
1986		19,724				17,551		
1987		20,200				17,959		
1988	(20,787)	21,043	(21,547)	24,000	(18,457)	19,006	(19,297)	21,468
1989		22,223				19,796		
1990		23,319				20,738		
1991		24,632				22,220		
1992		25,774				23,113		
1993	(25,387)	26,691	(27,792)	31,776	(22,782)	23,662	(24,868)	27,936
1994		27,013				24,198		
1995		27,675				24,551		
1996		27,892				24,743		
1997		28,499				25,101		
1998	(28,083)	29,078	(30,408)	35,088	(25,329)	25,973	(26,683)	30,948
1999		32,952				27,543		
	East Germany - entire population[c]							
1991		14,455				13,716		
1992		17,696				16,740		
1993	(19,700)	20,028	(20,664)	21,394	(18,300)	18,741	(18,966)	19,944
1994		21,087				19,993		
1995		21,456				20,310		
1996		22,746				21,524		
1997		23,203				21,965		
1998	(22,979)	23,701	(24,136)	26,508	(22,078)	22,500	(23,035)	24,456
1999		24,792				23,302		

Table 3.2. (cont.)

[a] Income Basis: In the SOEP, annual incomes are collected every year in springtime for the preceding year, in the EVS by continuous bookkeeping during a year (until 1993) and a quarter of a year (1998), respectively (both concepts including imputed rent for owner-occupied housing). In SOEP, incomes are corrected by 1% bottom-coding; furthermore, as with EVS, post-government incomes of zero are excluded from the analysis.
Equivalence scale: former OECD scale (the household head is weighted by 1.0; further household members older than 14 years are weighted by 0.7, children up to the age of 14 by 0.5)
[b] Values in brackets: lower and upper bound, respectively, of the 93%-confidence interval
[c] Population: persons in private households; in the SOEP "German households" are defined as households without foreign members older than 15 years, in the EVS the definition refers to the nationality of the household head. SOEP results for 1993 are calculated without sample D (immigrants), 1997 without sample E (supplementary sample to compensate panel attrition)

More important are the time series results regarding distribution (see Table 3.3). According to SOEP income inequality among the Germans in West Germany went down slightly between 1983 and 1988 with a more pronounced decrease in the middle of the 1980s, which may be explained by the boom in West Germany before reunification (middle panel of Table 3.3). This change is not observed with EVS data between the years 1983 and 1988 for which the Gini coefficient was nearly the same. Poverty calculated from the SOEP also decreased in the middle of the 1980s but was nearly constant when the rates for 1983 and 1988 are compared (middle part of middle panel in Table 3.3). In contrast, poverty rates increased considerably when poverty rates based on EVS data are compared between 1983 and 1988. In 1983 the EVS results are outside the confidence intervals of the SOEP so that one cannot draw a definite conclusion from these numbers.

For the period from 1988 to 1998 both surveys show a substantial increase in inequality as measured by the Gini-coefficients and by the poverty rates. The differences between 1993 and 1998, however, which show up from SOEP data are so small that they are not statistically significant. The comparable results from EVS data indicate a slightly higher increase in poverty, but having in mind the change in the reporting period for EVS between 1993 and 1998, this finding has to be interpreted cautiously.

Table 3.3 (first panel) also shows that the poverty rates for West Germany change only slightly when households with a foreign head are included, and mean income and the poverty line, respectively, are defined on the basis of the entire population in West Germany (first panel of Table 3.3). For example, looking at SOEP based results, in 1993 and 1998 we find 12.9 % and 13.0 % of the entire resident population to be poor based on a poverty line derived from income of the entire population compared to poverty rates of 12.9 % and 12.7 % if only the German population is considered (middle part of middle panel in Table 3.3). This

Table 3.3. Post Government Income[a]: Inequality and Poverty [%]

	Gini coefficient				Poverty rate				
	SOEP[b]			EVS	SOEP[b]			EVS	SOEP[b]
	West Germany - entire population[c]								
					Poverty line: 50% of mean equivalent income of the entire population in West Germany				
1983	(0.2604)	0.2773	(0.2970)	-	(10.3)	11.1	(12.1)	-	-
1984		0.2823				11.7			-
1985		0.2739				10.8			-
1986		0.2677				10.0			-
1987		0.2688				10.0			-
1988	(0.2515)	0.2705	(0.2823)	-	(9.3)	10.3	(12.1)	-	-
1989		0.2772				10.3			-
1990		0.2755				11.4			-
1991		0.2795				12.0			-
1992		0.2851				12.4			-
1993	(0.2859)	0.2904	(0.2988)	0.2686	(11.8)	12.9	(13.9)	10.3	-
1994		0.2936				13.3			-
1995		0.2920				13.7			-
1996		0.2911				12.9			-
1997		0.2894				12.8			-
1998	(0.2750)	0.2890	(0.3024)	0.2717	(11.7)	13.0	(14.8)	11.2	-
1999		0.3213				13.5			-

Table 3.3. (cont.)

	Gini coefficient				Poverty rate						
	SOEP[b]			EVS	SOEP[b]			EVS	SOEP[b]		
	West Germany - only German population[c]										
					Poverty line: 50% of mean equivalent income						
					of the German population in West Germany				of the entire population in West Germany		
1983	(0.2564)	0.2772	(0.2989)	0.2502	(10.2)	10.8	(12.2)	7.7	(9.7)	10.3	(11.7)
1984		0.2835				11.5				11.2	
1985		0.2746				10.6				10.0	
1986		0.2694				9.8				9.3	
1987		0.2696				10.1				9.6	
1988	(0.2508)	0.2718	(0.2860)	0.2527	(9.0)	10.7	(12.3)	8.8	(8.4)	10.1	(12.8)
1989		0.2779				10.3				9.8	
1990		0.2775				11.9				11.3	
1991		0.2788				11.7				11.0	
1992		0.2860				12.4				11.7	
1993	(0.2858)	0.2901	(0.2985)	0.2670	(11.7)	12.9	(13.7)	10.1	(10.0)	11.8	(13.7)
1994		0.2913				13.3				12.3	
1995		0.2881				12.9				11.9	
1996		0.2873				11.8				11.2	
1997		0.2879				12.3				11.6	
1998	(0.2746)	0.2842	(0.2942)	0.2696	(11.4)	12.7	(14.3)	10.9	(9.7)	11.9	(13.2)
1999		0.3208				13.3				12.0	

Table 3.3. (cont.)

	Gini coefficient				Poverty rate				
	SOEP[b]			EVS	SOEP[b]			EVS	SOEP[b]
	East Germany - entire population[c]								
					Poverty line: 50% of mean equivalent income of the entire population in East Germany				
1991		0.2118				6.5			-
1992		0.2099				5.4			-
1993	(0.2009)	0.2235	(0.2456)	0.1994	(5.4)	7.5	(8.1)	3.1	-
1994		0.2207				7.5			-
1995		0.2210				7.6			-
1996		0.2244				7.6			-
1997		0.2213				7.8			-
1998	(0.2130)	0.2203	(0.2385)	0.2170	(5.7)	7.8	(9.0)	4.5	-
1999		0.2139				6.5			-

[a] Income Basis: In the SOEP, annual incomes are collected every year in springtime for the preceding year, in the EVS by continuous book-keeping during a year (until 1993) and a quarter of a year (1998), respectively (both concepts including imputed rent for owner-occupied housing). In SOEP, incomes are corrected by 1% bottom-coding; furthermore, as with EVS, post-government incomes of zero are excluded from the analysis.
Equivalence scale: former OECD scale (the household head is weighted by 1.0; further household members older than 14 years are weighted by 0.7, children up to the age of 14 by 0.5)
[b] Values in brackets: lower and upper bound, respectively, of the 93%-confidence interval
[c] Population: persons in private households; in the SOEP "German households" are defined as households without foreign members older than 15 years, in the EVS the definition refers to the nationality of the household head. SOEP results for 1993 are calculated without sample D (immigrants), 1997 without sample E (supplementary sample to compensate panel attrition)

slight difference in the poverty rates results from a combination of two effects. On the one hand, the poverty line decreases because the average net equivalent income of the foreign residents is lower than that of Germans. This reduces the poverty ratio of the Germans. On the other hand, the even lower poverty line applied to foreign residents results in a rather high poverty rate among this group, which compensates the reduction in the poverty rate among the Germans.

To show the effect of the change of the poverty line the right-most part of the middle panel uses a poverty line that is calculated by taking the entire population into account but applying this poverty line only to the German population in West Germany. In this case poverty rates are always lower than in the middle part of the middle panel because the poverty line is lower due to the lower average income of foreign households. The difference in the poverty rates is between 0.3 and 1.3 percentage points, and it has increased during the 1990s.

Inequality of post-government incomes increased after reunification in the New Länder, too (bottom panel of Table 3.3). According to SOEP this rise mainly occurred during the first years of the transition period followed by only small changes, which are not significant, during the period between 1993 and 1998. The period from 1990 to 1992 is not covered by EVS, which was not in field until 1993. But the increase of the Gini-coefficient between 1993 and 1998 is even more marked than the development at the beginning of the 1990s indicated by SOEP. The still lower level of inequality resulting from EVS data parallels the much lower poverty rates where the difference to SOEP based findings really is striking.

Reviewing our brief look at empirical findings, which result from EVS and SOEP based on comparable definitions of annual income, there remain some differences with regard to income levels and the extent of inequality. However, some trends show up in a similar way in both surveys, in particular, the increase of inequality and poverty rates from the end of the 1980s to the end of the 1990s in West Germany and during the 1990s in East Germany, respectively.

With regard to income mobility, which the Canberra Group also emphasizes to study, we cannot extend our comparison given the restriction of EVS to pure cross-section information. The possibility to analyze income dynamics is one of the major advantages of SOEP – and research has gained a lot from its longitudinal character[36].

4 Summary

In principle, EVS and SOEP follow similar definitions for households and incomes. But due to conceptual differences concerning income recording, the surveys differ somewhat in practice. EVS samples incomes in more detail. This is

[36] Cf. e. g. Bundesministerium für Arbeit und Sozialordnung (2001), Burkhauser et al (1999), Biewen (2001), Hauser and Fabig (1999), Fabig (1999), Bird et al. (1998), Hauser et al. (1994).

one explanation for higher income averages compared to SOEP. Additionally, the most important non-cash income component, imputed rent, is upward biased in EVS, if the recommendations of the Canberra Group are taken as a benchmark. Further differences emerge from the fact that EVS samples income taxes and social security contributions directly, whereas these are simulated in SOEP. The impact of some problems of directly sampling taxes is not known. But it is known for certain that the simulation approach overestimates taxes paid, especially for high-income households, and thus, most likely leads to an underestimation of mean net income as well as of inequality.

A major shortcoming of the EVS results from the insufficient coverage of foreigners, and the quota sampling raises doubts as to the statistical significance of small changes. Furthermore, there seems to be a middle group bias so that inequality of the distribution of income is underestimated. The SOEP, which is a random sample, covers foreigners adequately, but has to overcome the problem of a high non-response rate for the first wave of interviews. It seems probable that households at the tails of distribution, which do not fully participate in the EVS also refuse to participate in a panel study. This hypothesis is supported by the fact that social assistance recipients, who can be considered as "non-mainstream" households, are underrepresented in both samples. Therefore, both surveys tend to underestimate the inequality of the distribution of income in this respect.

Because foreigners are not covered by EVS till 1988, and because they are covered in an insufficient manner sine 1993, time series of the income distribution for West Germany, which are based on EVS refer only to German residents. Thus a reader must carefully check SOEP results whether they include foreigners or not. In addition, SOEP covers some institutionalized population groups (but not in a representative manner) so that it is again necessary to check if this group is included in a particular analysis before comparing the results with EVS findings. Additionally, the reader has to check, whether SOEP based results are using annual income of the previous year or monthly income of the month of the interview (income screener) as the latter diverges considerably from the former, and is comparable neither with income based on the bookkeeping approach of the EVS nor with the retrospective sampling of annual income of the SOEP.

When looking at the results of EVS and SOEP, respectively, some sampling error has to be kept in mind, which matters especially if small subgroups of the population are analyzed. The calculation of exact confidence intervals, however, is hampered, because the EVS is a quota sample. Confidence intervals for SOEP[37] show that year-to-year changes in inequality in West Germany very often are too small as to make a statement about significant differences. Thus, a cautious interpretation of short-run changes seems appropriate.

Over a five-year period, however, analyses based on the SOEP find a significant increase of inequality for the period 1988 to 1993, which corresponds to results based on the EVS. The remaining discrepancies between levels of average

[37] Calculated by the "random group approach" which takes into account the stratification of the survey as well as differential non-response in course of time.

income, inequality indicators and poverty rates as well as between the exact points of time when the changes occurred, seem to be a matter of minor importance in view of the differing features of EVS and SOEP.

In judging results of income distribution analyses one has to keep in mind that on the one hand, assumptions, especially about the equivalence scale and the poverty line, may have a significant effect on outcomes, in particular for subgroups of a population. Furthermore, for Germany it is important whether the poverty lines are defined separately for West and East Germany, which is the concept used in the presentations above, or whether average income of reunified Germany is used as a baseline – an approach more widely used in analyses of the end of the 1990s. On the other hand, results for overall Germany after unification are sensitive to the assumptions about price levels in East and West Germany because immediately after unification the price level in East Germany was considerably lower than in West Germany.

Concluding, based on a synopsis of methodological differences between EVS and SOEP (see Table A1 in the Appendix) combined with some descriptive analyses, we find credible arguments to explain the differences in income distribution measures given on the basis of the two major household income surveys in Germany. But both surveys have their strong points in which the other one cannot compete. With the SOEP these are the possibilities for dynamic analyses, and broader basis for causal analysis. With the EVS it is the larger sample size which allows for the analysis of small population groups, and it is the more detailed income recording and the extensive coverage of expenditures, savings and wealth holdings[38] which allows for analyses in fields not covered by the SOEP. It is also obvious, however, that – besides the necessity to re-establish the annual income concept – there is room for improvement of the EVS. This is much more complicated than with the SOEP since major changes have to go through Parliament. The new approach of Eurostat to establish a new European Survey on Income and Living Conditions (EU-SILC), which can be enacted with binding force for all member states, justifies the hope for better internationally comparable official household income data in the future.

[38] Cf. Schlomann (1992) and Hauser and Stein (2001).

Appendix

Table A1. Methodological characteristics of household income surveys in Germany: EVS and SOEP.

	EVS	SOEP
Survey	repeated cross-section	panel
Survey interval	every 5 years - since 1962/63 in West Germany - since 1993 in East Germany	yearly - since 1984 in West Germany, - since 1990 in East Germany
Sampling method	quota sample based on the mandatory random Micro Census (800,000 persons)	stratified random samples (random route)
Sample size	1998: approx. 60,000 households; scientists get random sub-samples of 80 % to 98 % of the original	1984-2000: approx. 6,000 households since 2001: approx. 12,000 households
Survey population	- non-coverage of institutionalised population - until 1988: private households with German heads, only - since 1993: all private households - two interviews with household head at the beginning and at the end of the year; bookkeeping about all incomes and expenditures during the year	- all private households - institutionalised population is partly covered via follow-up of initial (wave 1) households - interviews with household head and possibly with all household members aged 17 and over
Household definition	income sharing unit	income sharing unit
Coverage of households with foreign heads	- no coverage until 1988 - since 1993: covered	explicit over-sampling
Coverage of households in the extremes of the income distribution	- no homeless - non-coverage of households with monthly net incomes of more than 35,000 DM (1998)	- no homeless - starting 2002 SOEP will include an additional sample of the very rich

Table A1. (cont.)

	EVS	SOEP
Weighting	cross-sectional adjustment to marginal distribution given by Micro Census for the federal states (household size, social status of head, net household income [income screener in income brackets])	- cross-sectional adjustment of first waves to marginal distribution given by Micro Census - cross-sectional and longitudinal weighting factors based on (sub-sample specific) attrition analyses
Collection of income data	continuous bookkeeping by the participants	- monthly (net) household income ("screener") - major gross income components in the month of interview - retrospective income data for previous year
Reference period	- until 1993: annual income of current calendar year - since 1998: quarterly income of reference period	monthly income as well as annual income of previous calendar year, i.e. retrospective questions
Reference household	Household characteristics are given by those persons who predominantly lived in a given household during the reference period (alternatively: household characteristics at time of the starting interview)	household composition as given at time of interview (mostly Jan-April) in year t (annual income as of t-1)
One-time supplements for employees, bonuses	included in survey	included in survey
Imputed rent for owner occupiers	- imputation of gross rental value, procedure based on rents paid by tenants according to detailed tables; - deduction of maintenance cost, insurance, taxes; - no deduction of financing costs (interest on mortgages); - this results in a modified net rental value.	- imputation of gross rental value, procedure based on hedonic regression models; - deduction of maintenance cost, insurance, taxes; - deduction of financing cost (interest on mortgages); - this results in a net rental value according to the recommendations of the Canberra Group.
Explicit non-coverage of income components	interest from life insurance is not recorded during the time they are accruing but later included in the total payments from life insurance	- fringe benefits - income from asset-creating schemes ("Vermögenswirksame Leistungen") - interest from life insurance - income from private sales

Table A1. (cont.)

	EVS	SOEP
Handling of missing values due to item-non-response and imputation of missing data	- expert-imputation (on the basis of comparison with sum of expenditure as shown by bookkeeping and personal judgement of EVS-staff) - imputed values cannot be identified in micro-data	- imputation based on cross-sectional and longitudinal information following the "row-and-column-" imputation technique - imputed values are flagged in micro-data - no imputation of non-reported income due to unit-non-response of single household members
Taxes and social security contributions	payments during the response period included in survey, but no allowance for final tax assessment	imputation based on basic tax routines and flat deduction for employees, provisional lump sums, tax exemptions for capital income, and child allowances

Table A2. Hypotheses about systematic effects of survey characteristics on income distribution measures in Germany: EVS and SOEP

Characteristic	EVS				SOEP			
	Property	Effect on ...			Property	Effect on ...		
		Mean	Inequality	Poverty rate		Mean	Inequality	Poverty rate
Coverage of very high income groups	restricted by top coding and under-representation	↓	↓	↓	under-representation	↓	↓	↓
Coverage of foreigners	under-representation	↑	?	↓	over-sampling	/	/	/
Income reference period	till 1993: year; 1998: 3 months	/ ?	/ ↑	/ ?	year	/	/	/
Sampling method	quota sample	?	?	?	random	/	/	/
Imputation of missing values	expert-imputation	/	/	/	Computer-Algorithm	?	↓	↓
Coverage of different income categories	detailed	/	/	/	less detailed	↓	?	?
Imputed rent (given Canberra Group's recommendation of including a net measure)	modified net imputed rental value	↑	?	↑	net imputed rental value	/	/	/
Taxes and social security contributions	actual payments included, but no allowance for final tax assessment	?	?	?	imputed	↓	↓	↓

/ : No systematic effect
↓ : Decrease
↑ : Increase
? : Effect unclear

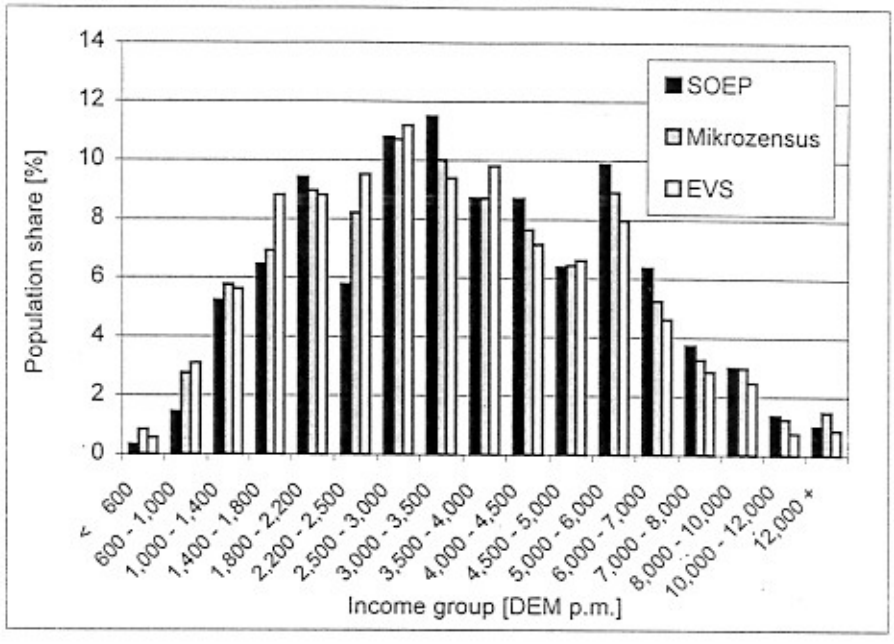

Fig. A1. Distribution of monthly incomes in EVS, Mikrozensus, and SOEP 1998

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