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**“Income distribution results in National Accounts – perspectives and restrictions of the
OECD basic approach in micro-macro-integration”**

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Abstract :

International debate on the measurement of economic well-being calls for integrating data on socioeconomic disparities in a national accounts framework. In recent years, possibilities to display income (and other) distribution figures from national accounts by socio-economic groups as important additional indicator for economic welfare have already been examined by some statistical offices and are currently promoted at the level of international organizations (Eurostat/OECD).

This paper first presents an analysis of the income distribution in Germany, generated according to an international approach by integrating national accounts data and household budget survey figures for the year 2008. This requires that income broken down by component is conceptually harmonized, that grossed-up survey values are confronted with the national accounts level and that an adjustment coefficient for each single income component of disposable income is applied. The income divergences in Germany are assessed by comparing results before and after methodological adjustments.

The second question addressed by the paper is in how far the adjustments carried out to the micro data have an impact on distribution indicators like the S80/20-ratio, the median or the Gini-coefficient. This enables to conclude on how statistical techniques in the process of micro-macro-integration are influencing income distribution indicators. Given the high priority assigned to distribution issues by international organizations (eg. OECD, Eurostat), this paper is providing a contribution to assess these endeavours against the background of available data resources.

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*“Income distribution results in National Accounts – perspectives and restrictions of the OECD
basic approach in micro-macro-integration”*

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1. Introduction :

The ongoing international debate on the measurement of economic well-being, as a part of the more general issue of the progress of societies, creates a growing need for data on socioeconomic disparities in a national accounts framework. The report of the so called Stiglitz-Sen-Fitoussi Commission published in 2009 emphasized, what was already known to statisticians since many years: Neither an income aggregate for the household sector nor an average income per household is sufficient to highlight the economic conditions of different groups of private households. This is especially the case, when inequality is rising and disparities between households are growing¹. To be able to portray such distributive developments and changes additional information is needed. For the sake of international comparability the underlying methodological concepts should best be based on a national accounts framework. A potential advantage of a national accounts framework compared to household surveys is internationally harmonized concepts and an assumed higher degree of completeness with respect to the income captured, although the latter cannot always be taken for granted.

In recent years, possibilities to display income distribution figures by socio-economic groups based on national accounts, as important additional information for economic well-being, have already been examined by some statistical offices². Moreover, currently the idea is promoted by various international organizations (mainly OECD and Eurostat). The necessary statistical basis for distributive information on household groups' income is adequate micro data from reliable surveys. In this respect in Europe, ten years after the report of the Canberra City Group³ in 2001, a new statistical device has evolved with the European Survey of Income and Living Conditions (EU-SILC), which is characterized by a harmonized methodological framework at the European level⁴. But other micro sources may exist as well and for the time being may offer a better compilation basis. Such issues have to be considered when developing income distribution data

¹ The OECD Report „Growing Unequal“ from 2008 illustrates how income inequality in most OECD member countries is rising, cf. OECD (2008)

² The French statistical office (INSEE) has published national accounts income distribution results for 2003, cf. Fesseau et al. (2009)

³ cf. The Canberra Group (2001)

⁴ cf. Eurostat (2010)

by household groups in a national accounts framework. In addition, there are methodological challenges to cope with when integrating micro- and macro-data. A first example is imputed income components from national accounts, which are not recorded in household surveys. Another challenge is to find a common scope for the household sector in national accounts and in the household survey used (e.g. how to deal with institutional households that are included by national accounts but not covered by household surveys). In addition and more generally, an appropriate income concept has to be chosen. Should it be disposable income or adjusted disposable income as defined by national accounts? Or could there be another income concept which is less complicated to understand for the general public?

This paper presents a first tentative analysis of the income distribution in Germany for the year 2008, generated according to an OECD basic approach by integrating national accounts data and German Household Budget Survey (HBS) figures. In addition an important question addressed by the paper is in how far the adjustments to the surveyed micro data have an impact on distribution indicators, like the 80-20-ratio or the Gini-coefficient. A crucial aspect and a cornerstone for the sake of analytical transparency is to show the impact of the methodological transformations on the micro-data. What are distribution results looking like before and after experimental transformations in a national accounts framework?

2. Approach and data sources – an overview

2.1. The OECD basic approach to integrate micro data with national accounts aggregates

The generation of distributional information by household group in a national accounts framework requires adequate statistical sources providing micro-data. Usually household survey data or figures derived from tax statistics offer micro variables, that enable to compile an income concept which is (mostly) comparable to that of national accounts. A promising way to integrate distributional information at the micro-level with national accounts aggregates has in the recent past been developed by the French Statistical Office (INSEE). The approach as applied by INSEE can easily be implemented in a technical sense⁵. It focuses on an adjustment of survey information to the level of the national accounts income aggregate, i.e. the various income components multiplied with the respective survey design weights for the households are rendered equal to the respective national accounts income aggregate. This approach assumes implicitly that under- or overestimation of an income component is proportionally distributed. Currently, France at the OECD level is the only country which has published a national accounts income distribution and the approach is therefore presented as an example of how distributive

⁵ Cf. Bellamy et al. (2009)

information could be integrated in the national accounts aggregates. Given that the OECD promotes the idea of using unique adjustment coefficients per income component as a starting point for its National Accounts Expert Group ⁶, we deliberately call this approach the OECD basic approach.

As will be clarified below by means of experimental calculations for Germany, this OECD basic approach is feasible as long as over- or under-coverage of household survey data in relation to national accounts aggregates is proportionally distributed across households for each analyzed income component. In the case of small differences it seems acceptable to use adjustment coefficients per income component to distribute the residual. However, the question arises what will be the consequence if the difference between the micro data total and the national accounts aggregate is big and / or not distributed proportionally?

2.2 Data Sources for Micro-Macro-Integration in Germany

As a starting point it seems crucial to obtain clarity about the concept of the income information recorded in micro-sources as well as about the level of detail. With regard to household surveys, in Germany there are three different ones providing income information. The German version of the European Survey of Income and Living Conditions (SILC) and the German household budget survey (HBS) are both carried out by the Federal Statistical Office (Destatis) in collaboration with the State Statistical Offices, whereas the Socioeconomic Panel (SOEP) is run by the German Institute of Economic Research (DIW)⁷. Main features of these three surveys are presented in table 1.

The data basis used for the micro-macro-integration in this article comes from the German HBS because of several reasons: There is no survey in Germany that currently comprises as detailed income variables as the HBS. In addition, the HBS provides auxiliary information to assign some national accounts specific income components to households when no corresponding direct micro information is available. Furthermore, the sample size of 60.000 households enables to exploit data with more analytical depth compared to other household surveys in Germany. The German SILC data do currently not yet provide the income data with the required level of detail. The SOEP data do not comprise some income components we consider to be important like transfers between households paid or benefits that public officials receive to cover a substantial part of their health care expenditure.

⁶ Expert Group on Measuring Disparities in a National Accounts framework (EGDNA)

⁷ cf. Wagner et al. (2007)

Table 1: Overview of sample designs of household income surveys in Germany

	Survey of Income and Living Conditions	Household Budget Survey	Socioeconomic Panel
Data producer	German Statistical Office (Destatis)	German Statistical Office (Destatis)	German Institute for Economic Research (DIW)
Sample Size	14.000 households	60.000 households	11.000 households
Frequency	annual	5-years-turn (latest: 2008)	annual
Recording mode	By written questionnaire	By written questionnaire	By face-to-face interview
Voluntariness	yes	yes	yes
Imputations for item-non-response	yes	no	yes
Particularities in terms of income assessment	Detailed recording of income information.	Detailed recording of income information, each household for one quarter of the reference year Households with net household incomes beyond 18.000€ per month are excluded	Detailed recording of income information.

Moreover, income tax statistics can be considered as an interesting data source as well, particularly since it covers taxpayers even at the very top of the income distribution. But there are some fundamental constraints which restrict the use of income tax statistics as general basis for compiling an income distribution by household groups. The main methodological differences are the following:

- Taxpayers recorded in income tax statistics are not identical with households. There might for example be married couples that appear as one taxpayer but as well cohabiting taxpayers that are recorded as two separate taxpayers in tax statistics. In the latter case the actual household behind cannot be identified.
- In case of children, corresponding tax allowances are attributed either to one partner or they might be shared. Children might not be living in the same household while they are fiscally still related to their parents. Furthermore children living in the same household with own earnings might be recorded as separate taxpayers if the income is beyond the tax allowance threshold.

- Households that do not pay income tax are not recorded in tax statistics. Therefore the lower end of the income distribution from income tax statistics is under-represented in comparison to the upper end.
- Income components that are not subject to taxation (e.g. some social transfers in Germany) are not recorded in tax statistics.
- In case of entrepreneurial income the respective scope in Tax Statistics is defined according to tax law. When taxable income from tax statistics is compared to primary income from national accounts there is a substantial conceptual difference resulting from depreciation: While consumption of fixed capital in national accounts is conceptualized in a linear way and compiled with the help of model calculations, taxation practice may use differing legal rules.

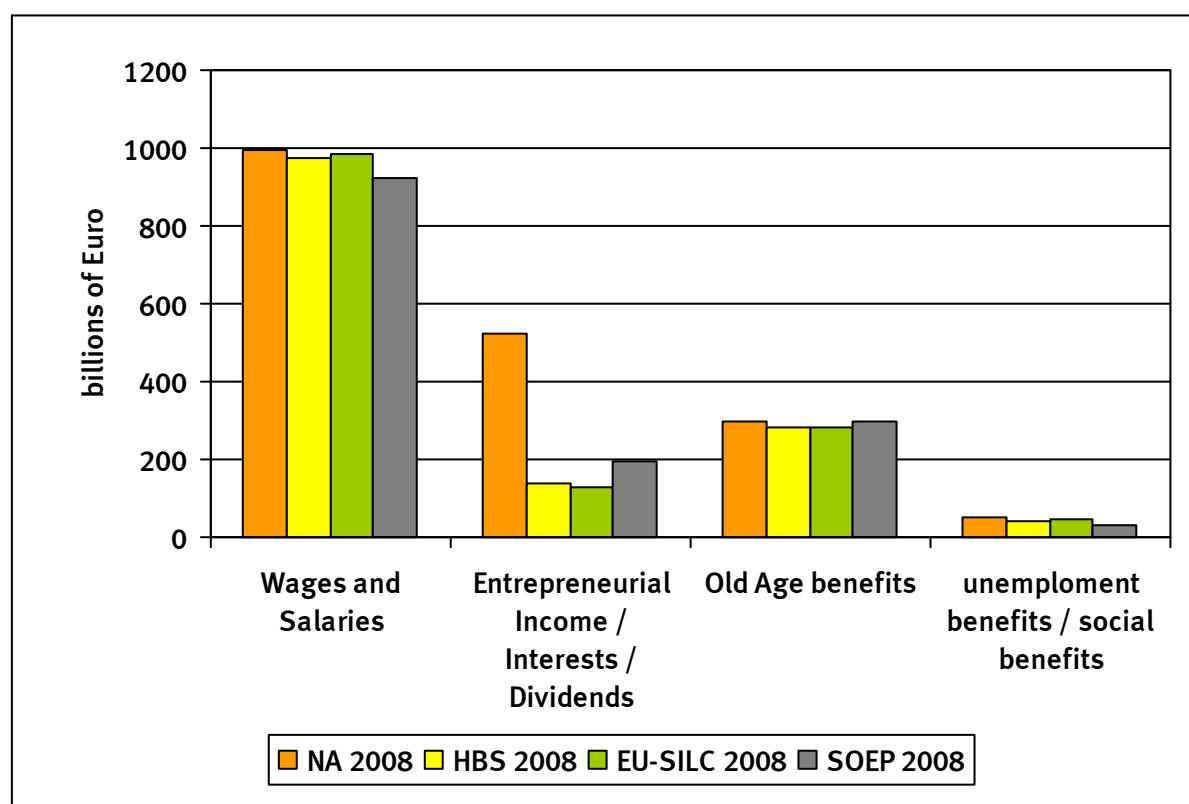
Due to such conceptual differences data from income tax statistics cannot be used as a general micro-base for the purpose of a micro-macro-integration in Germany. But tax statistics provides useful additional information particularly on high income earners. In addition, it could be asked whether new statistical techniques like matching or linking of different sources could be a way forward to make better use of tax statistics.

Turning back to the above mentioned household surveys, an interesting question is how the income data (by type) compares with national accounts income aggregates. The different surveys display the typical strengths and shortcomings of income surveys on a voluntary basis.

Compared with national accounts income aggregates for the household sector, all three surveys cover a majority of what national accounts are measuring with respect to recorded income totals of wages and salaries, old age benefits as well as unemployment benefits and social aid, while a major gap between survey figures and national accounts data is visible in case of entrepreneurial and property incomes (Chart 1). This is assumed to be due to typical under-coverage of high income households in household surveys but also due to difficulties to record unsteady receipts in the course of the calendar year. On the other hand, a lack of data sources with respect to estimate withdrawals from Quasi-Corporations in national accounts has to be mentioned.

Therefore this aggregate has to be derived as residual in the generation of income account. This implies that an error in the compilation of output, intermediate consumption or value added components affects entrepreneurial income, unless they balance out.

Chart 1: Income Aggregate Values, National Accounts, HBS, EU-SILC, SOEP (Preliminary calculations)



The question may be raised, whether it is possible to substantiate the undercoverage of entrepreneurial and property incomes in the household budget survey. A possibility in this respect is to compare the information on financial assets with those of the stock data available from the financial accounts, which in Germany are compiled by the Bundesbank, mainly using bank statistics. A comparison between the stocks of financial assets from the HBS-data with those from financial accounts reveal, that for all asset types the latter show a much higher amount (cf. table 2). In our view, this also indicates a serious selectivity bias in household surveys for corresponding property incomes.

Table 2: Wealth Components as measured by German Household Budget Survey and German Financial Accounts – 1 January 2008

	HBS	Financial Accounts
Billions of Euro		
Bank Deposits	908	1459
Bonds	71	297
Shares	155	371
Mutual Fund Shares	324	661
Claims on Life-Insurance Corporations	484	684

3. Income Concept to measure economic well-being

3.1. Introductory considerations

When assessing economic well-being, a couple of methodological issues have to be addressed. A first question relates to the appropriate unit. When dealing with well-being, usually the well-being of citizens is aimed at. But in national accounts the smallest unit in this respect is not each individual citizen but a private household. According to the SNA-2008 “a household is defined as a group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food.”⁸ And in fact income may have different sources: On one hand generated income is mostly paid to individuals for their participation in the production process, like wages and salaries, but may also relate to a household (e.g. actual rent received for real estate property in joint ownership). In addition, benefits and allowances from general government are usually paid by taking into consideration the needs of the household concerned and taxes due will usually include elements relating to the household size and situation. Similarly at the expenditure side: at least certain parts of final consumption expenditure may not be separable between individual household members (e.g. housing, mobility or leisure). It is the household income that is determining household economic welfare and consumption opportunities. Basically this means that the household is considered as the most appropriate economic unit in national accounts, which is very similar to household surveys.

Another issue relates to the appropriate income concept. On one hand disposable income would seem a good candidate, which in national accounts represents the amount available to a household for consumption expenditure and saving. On the other hand, adjusted disposable income is an extended concept that in addition comprises social transfers in kind from general government to households. Both genuine national accounts concepts cover not only actual income received, but also some imputed income components like property income attributed to insurance policy holders, income from imputed rents for owner-occupied dwellings or FISIM-adjusted interests. Such imputed income components cannot, or not easily, be captured by household surveys. Therefore it has to be acknowledged that there are constraints in what can be measured in terms of household incomes by conducting surveys. Property income attributed to insurance policy holders, for example, cannot be reported by a household, since the revenue generated by life insurance companies is not distributed to the policy holders but added to the

⁸ United Nations, European Commission, OECD, IMF, Worldbank: System of National Accounts 2008, New York 2009, paragraph 4.149.

existing amount of assets owned by them. This seems to indicate that what best can be measured by household surveys is what households perceive as their income. But even in the case of actual income components there may be problems of (exhaustive) coverage. Difficulties for household members to indicate every component requested by the survey interview may result for instance from unsteady or one-off income receipts or backdated payments. Moreover, holding gains (no losses) are not considered as a component of income in national accounts. And finally from a practical point of view, possibly not every desirable income component can be covered by a survey since the total length of the interview has to be limited to avoid non-response.

Nevertheless some crucial issues have to be considered:

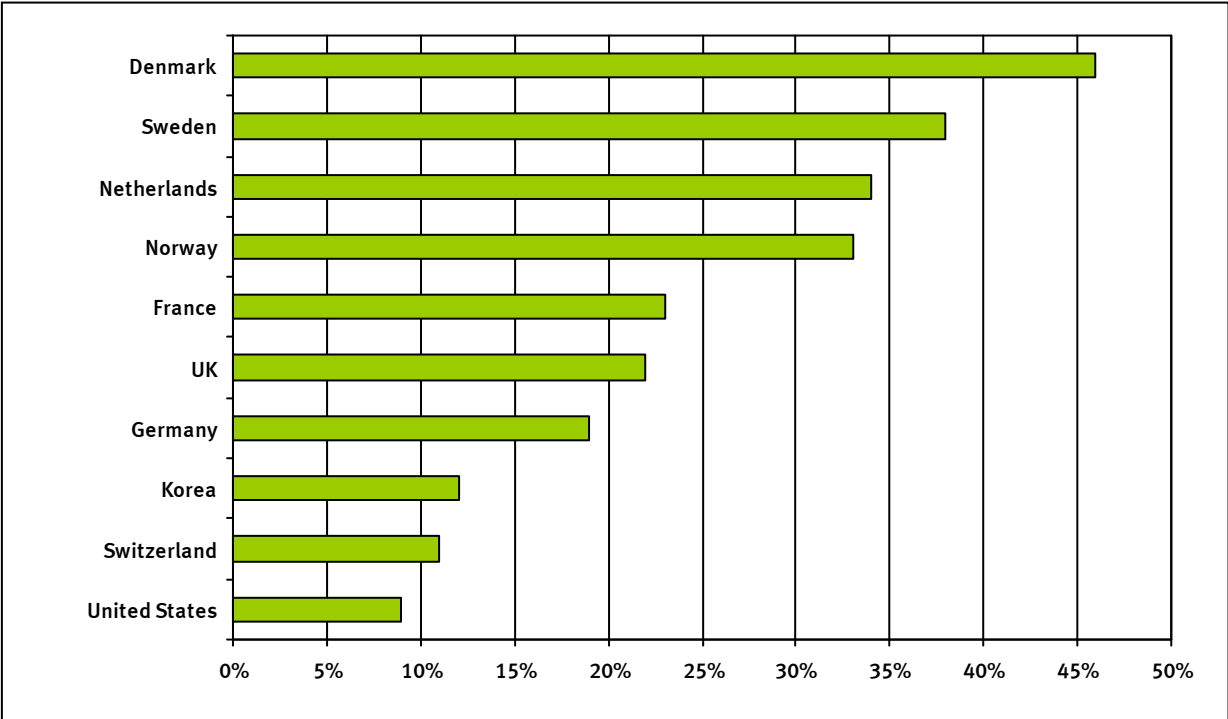
- Which is the appropriate income concept to be used for the micro-macro-integration?
- What has to be taken into account for international comparisons of economic well-being in contrast to a pure national focus?
- In a wider perspective: Which role should household production and revaluation of assets play in a comprehensive view that is considering all kinds of revenue determining consumption opportunities?

3.2 Which disposable income for international comparisons?

For income comparisons at the international level, the income concept should be able to assure comparability between countries in terms of economic well-being. If disposable income of private households was used, income tax and social contributions would have to be deducted and on the other side social benefits to be added. The crucial question is how to deal with social transfers in kind (STIK), resulting from different public welfare regimes. These in-kind-services are provided by government at low or without costs to private households. While for example in a country A the taxation level may be high corresponding to a greater extent of public goods and services, the taxation level may be lower in another country B due to the predominance of private health care and privately funded education services. If average disposable income per capita is compared between these countries, misleading conclusions could be derived. At a first glimpse country B might seem to be better off, since *ceteris paribus* its average disposable income per capita will be higher than in country A. This ignores the fact that in country B health care and education services have to be paid by the individual households from their disposable income, while these services are provided free or at low costs in country A. Such a bias in international comparability of disposable income of households per head can be avoided by taking into account STIK in the income concept, hence by using adjusted disposable income, which includes social transfers in kind. Another reason to include STIK in the income concept for purpose of

international comparisons is a distributional impact of publicly provided services for individual use: Since (almost) everyone has equal access, this will have an impact on the economic behaviour, particularly saving, of households. Chart 2 highlights the differences in the national importance of social transfers in kind (STIK) which illustrates the usefulness of an extended income concept that includes these transfers.

Chart 2: Social Transfers in Kind – 2008 – percentage of net disposable income



Source: OECD national accounts statistics, non-financial accounts by sectors; own calculations: $\text{percentage}_{\text{STIK}}(S.14/S.15) = (D63r-D63p)/B6n$

Imputing micro information on STIK to present the income distribution in an internationally comparable form requires assigning respective expenditures by government or NPISH to households as recipients of the benefits in kind. This can be done in different ways. The two main alternatives proposed⁹ are either assigning public expenditures by actual use (actual use approach) or to conceive them as sort of insurance value (insurance value approach). The actual use approach assigns expenditures for example in case of health care directly to households via frequency of medical treatments. The insurance value approach attributes to persons an amount the respective person would have to pay as insurance contribution if an insurance provider would have to cover the claims of all insured persons of the respective insurance collective by taking into account individual risk profiles. Amounts are then assigned according to criteria such as

⁹ Cf. Verbist et al.

gender or age. Both approaches bear the risk to display for example households with children receiving education services or persons with severe health problems consuming many health care services as better off. As a result of having children or being ill, household's position in income distribution might be changed upwards due to the extended income concept while the actual economic well-being in a sense of perceivable income streams has not changed. A possible alternative at least in case of health care expenses could be to conceptualize them as insurance value neglecting the individual risk profile, i.e. as social insurance value. This results in assigning to every member of compulsory health care insurance the same amount as a monetary value for having essential health risks covered by social insurance.

In a more general reflection, the question could be asked if it is perhaps more useful to include STIK only in the macro perspective without making imputations for the consumption of STIK on a micro statistics level. Especially if STIK are assigned by actual use or risk-related statistical profiles there might in case of certain household groups evolve a considerable gap between perceived socioeconomic status (by cash income) and status measured by adjusted disposable income (including STIK). Compared to income distribution results from micro statistics there is at least comprehensive additional explanations in case of publications of adjusted disposable income necessary to avoid misunderstandings related to a focus on certain socio-economic groups.

3.3 What about income from hidden and non-market activities?

Economic well-being often is constituted by more than household incomes resulting from market production. There are countries where informal economic activities play a major role and market transactions measured understate the actual production, income and consumption possibilities. Especially in rural areas with predominance of subsistence economy it might be difficult to assess the amount of goods and services produced, the income resulting from it and consumption opportunities. If population density in certain areas is low and access for interviewers related to high costs, official statistics are certainly reaching their limits to capture all economic activity. Even if informal economic activities are included within the production boundary of the SNA, their measurement and their distribution to a certain extent can be hypothetical from a practical point of view if no data sources are available. On the other hand a major reason why hidden activities exist is the fact that people try to improve their income situation. Insofar it would seem preferable, at least from a conceptual point of view, to include income from hidden economic activities in the income distribution¹⁰.

¹⁰ If the share of income from hidden activities is stable over time and the focus is on changes in the income distribution, it could be acceptable not to include them.

Another issue is household production which mostly is not included in the SNA production boundary. Unpaid work in households constitutes an important contribution to the economic activity also in countries with established market economies. Child caring, housework, care of the elderly and social commitment are unpaid activities that are generating economically significant amounts of income and consumption in an extended conceptual understanding. The operational way of capturing these activities is a satellite system that exploits time use survey data for the measurement of quantity of unpaid work (by type) and assigns appropriate monetary values to these activities. Since the chosen option for its monetary value is determining the amount of household production significantly, it has to be considered as additional information tool besides the core system of national accounts. In any case there should be awareness that in certain countries market production is only a bottom threshold for what is produced and consumed in reality and that official statistics possibly is not able to compare household incomes from every country of the world in an exhaustive way.

Revaluation of assets is another issue to be considered in a wider perspective of household revenue. Holding gains and losses are not part of disposable income in national accounts, since income as presented by national accounts refers to the corresponding period of economic activity. Holding gains and losses are conceptualized as changes in asset prices and not as income. This has to be kept in mind when economic well-being and income distribution is analyzed. Rising asset values will for example enlarge the financial flexibility of households, when holding gains are realized by selling assets. But even if holding gains are not realized, the rise of asset prices is making households feel richer, which in turn may influence their consumption behavior. While holding gains not realized should be treated as changes in distribution of wealth, it could be argued in favour of including realized holding gains or losses in an income distribution by household groups.

4. An experimental Income distribution for Germany

4.1 Comparing micro data and national accounts aggregates

For the calculations as presented below, we used an income concept which is quite close to the SNA concept. Table 3 not just gives a list of income components taken into account in the comparison but in addition intends to clarify methodological differences between national accounts figures and the Household Budget Survey data. Not all components are directly

comparable from a conceptual point of view and in certain cases substantial empirical divergences have to be recognized.

Table 3: Availability of income components in National Accounts and HBS: methodological comparison

National Accounts	Household Budget Survey	Remarks
Wages and Salaries including supplementary components	Wages and Salaries including supplementary components	Directly comparable
Entrepreneurial Income, withdrawals from Quasi-Corporations	Entrepreneurial Income: private withdrawals of self-employed and farmers	Conceptually comparable but fundamental empirical differences
Interest (FISIM adjusted)	Actual interest	Referring to actual interest from HBS, interest received from national accounts are assigned excluding FISIM and interest paid including FISIM
Dividends	Dividends	Directly comparable
Income from actual rent	Income from actual rent	Directly comparable
Income from imputed rent	Income from imputed rent	Independant approaches of calculation
Social Transfers: various components	Social Transfers: various components	Directly comparable
Social Contributions: various components	Social Contributions: various components	Directly comparable
Income Tax	Income Tax including subsequent payments or reimbursements due to tax assessment	In principle comparable but possible differences due to accrual recording in national accounts
Private Transfers paid and received not visible due to consolidation	Private Transfers paid and received: alimonies and cash gifts	Private Transfers assigned to household as measured by HBS by aggregate level of transfers received
Non-Life-Insurance Premiums and Benefits	Non-Life-Insurance premiums , Benefits not available	Insurance benefits distributed with premiums
Property Income attributed to Insurance Policy holders	Redemption values of Life Insurance Contracts	Property Income attributed to Insurance Policy holders from national accounts distributed with Redemption values of Life Insurance Contracts from HBS

With regard to the different income components and the generation of micro data, the following observations seem useful:

- Wages and salaries as well as supplementary components like christmas bonus, 13th month salary, income from secondary jobs etc. are recorded in great detail in HBS. Therefore it is possible to compile an appropriate micro variable almost exactly as defined by SNA.

- Entrepreneurial income and withdrawals from quasi-corporations, in contrast, is a difficult matter: the HBS is only asking self-employed and farmers to provide their withdrawals for the recording period of three months. It has to be kept in mind that problems may evolve from unsteady withdrawals and fluctuations in business that are perhaps not properly assessed by distributing the HBS recording period over four different quarters in the survey design. Furthermore, a lack of survey participation in the case of high income earners has to be assumed and households with a net income per month that exceeds 18.000 € are completely excluded from the survey design. The difference to the much higher income aggregate recorded by national accounts seems to indicate a substantial data coverage problem that might be induced by survey bias and/or a lack of data for withdrawals from quasi-corporations in national accounts.
- Interests paid and received from national accounts consist of FISIM adjusted interest and are assigned to HBS households by using actual interest as key.
- Dividends as recorded in the HBS are directly comparable to national accounts from a conceptual point of view. In both cases of interests and dividends received, there exists a considerable gap between national accounts and micro data with the empirical level in national accounts being three times higher than in HBS.
- Actual rent from national accounts as referred to in our calculations is directly comparable to HBS and assigned to households on the level of primary incomes (operating surplus minus mortgage credit interest).
- In case of imputed rent, calculations in national accounts and HBS are based on independent approaches and a comparability cannot be fully assured.
- Social transfers other than Social Transfers in Kind consist of many components that are assessed in the HBS as detailed income components and are directly comparable to national accounts figures.
- The various components of social contributions are recorded in HBS in a similar conceptual depth as in national accounts and also the empirical level indicates comparability.
- In case of income tax there are possible differences resulting from accrual accounting in national accounts compared to HBS where subsequent payments or reimbursements due to tax assessment are included in one single item of the survey questionnaire. The moderate empirical divergences can be assumed to result more likely from a systematic survey bias and under-coverage of high income households rather than from accounting differences.
- Private Transfers paid and received (by households) are not visible in the consolidated presentation of national accounts sector data. Private Transfers paid and received are

assumed to correspond to the aggregate HBS level of transfers received¹¹ and assigned to alimonies and cash gifts that households either pay or receive.

- While Non-Life Insurance Premiums are recorded in HBS, benefits are lacking. By nature of risk-insurance, individual benefits can be very high in case the ensured event occurs. Premiums are in contrast lower in level but distributed across all ensured households. The insurance benefits have been assigned to households by using insurance premiums paid, which corresponds to some sort of insurance value attributed to the respective households.
- Property incomes attributed to insurance policy holders is a concept specific to national accounts that usually will not be considered by interviewed households. Since in the HBS households report the redemption values of life-insurance contracts, this variable is used to assign property incomes attributed to insurance policy holders to households.

In addition, national accounts income figures are amended to cope with some other conceptual differences and to ensure a maximum of comparability with the HBS survey data. Firstly, in German HBS there is a cut-off threshold for households with more than 18.000€ net disposable income per month. Based on rough estimates using income tax statistics, the income amount attributed to the respective population is deducted from the national accounts reference figures. As furthermore institutional population is not covered by the HBS, an estimate for this group is deducted as well from the national accounts figures. Moreover, since German national accounts do provide the combined household sector, i.e. Households together with Non Profit Institutions Serving Households (NPISH), an estimate for NPISH is deducted from the national accounts' income components. As currently no comprehensive data sources for a split between households and NPISH are available in Germany, the estimates have to be seen as a preliminary attempt to provide a first insight. Within the next few years it is planned to provide more accurate figures for the split between these two sectors.

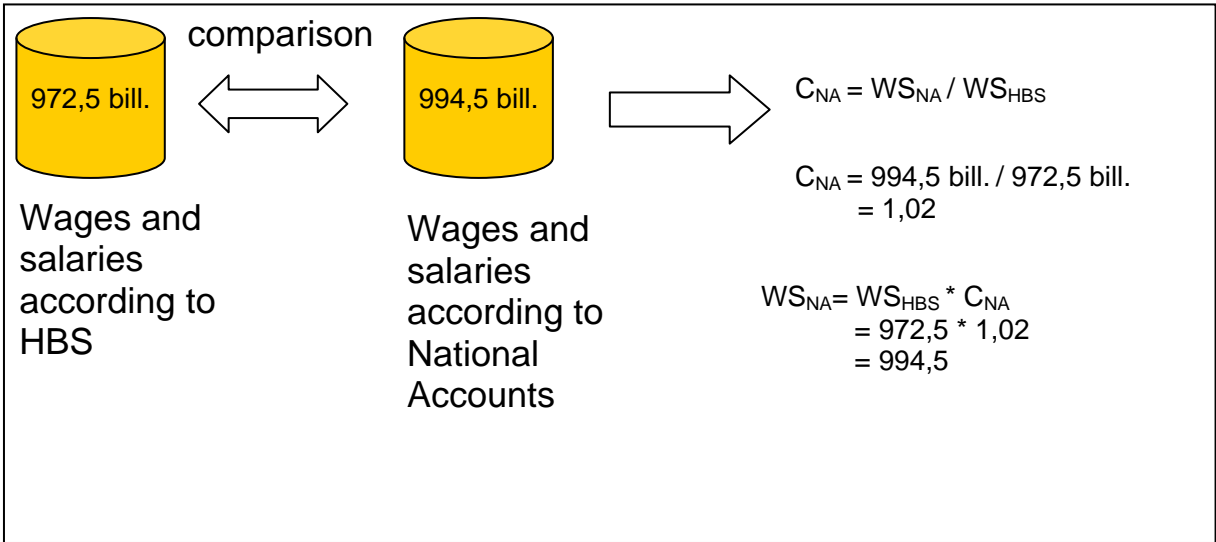
4.2. Implementing the OECD basic approach on distributional data in National Accounts

To generate distributional information for income aggregates of the national accounts household sector, adjustment coefficients are applied to the micro data. As illustrated in chart 3 for the income component wages and salaries, the starting point is a comparison between the grossed up survey income total and the national accounts income aggregate for each income component which is part of national accounts disposable income. To obtain comparable figure from HBS to contrast with the respective national accounts aggregate, every income record is multiplied with

¹¹ In national accounts the across the border transfers between households are included already, whereas the transfers between domestic households are missing. Since for domestic households transfers paid and received balance out, private transfers received from the HBS have been used as a proxy.

the respective survey design weight, to gross up the number of interviewed sample households to the number of population households. From this comparison adjustment coefficients for each component of disposable income are derived by dividing the national accounts income aggregate figure by the respective aggregate survey data value.

Chart 3 - Example: adjustment coefficients for wages and salaries



After having changed the survey income level for each income component, all components are added up resulting in disposable income according to national accounts definition. As not every household in the survey is receiving the same income components, there is a different income distribution resulting from the application of the adjustment coefficients¹². The differential change of income is shifting households up- or downwards in the income distribution. For example moderate adjustment coefficients for wages and salaries level up the revenue of respective households just slightly. Deductions in form of income tax and social contributions in contrast are adjusted upwards with a higher coefficient. As a result, households whose main source of income is wages and salaries move downwards in the income distribution (after tax) since the adjustment in case of revenues is less than in case of deductions. If on the other hand income from self-employed occurs as additional source of income in such households, high adjustment coefficients for entrepreneurial income might compensate this effect and even turn it into an upward shift for the respective household. This example shows that the interaction between income components received or deducted and adjustment coefficients applied determines the resulting income distribution. This is different from an adjustment method where total disposable income is multiplied by a unique adjustment factor.

¹² In the case of one overall adjustment coefficient for total disposable income the same distribution would be reproduced but at a higher level.

Using the same percentage adjustment for all households that receive the given income component implicitly assumes that a lack of coverage is proportionally distributed across all households for that particular income component. Although this may not be fully true in practice, the assumption is reasonable as long as gaps in the level between survey and national accounts data are not overwhelming. However, in our experimental calculations, adjustment coefficients resulting from a macro-micro comparison are quite different in level. On one hand, in the cases of most income components moderate adjustment coefficients were derived. On the other hand, the amount of entrepreneurial income or property income measured by national accounts is for example about three times higher than the comparative amount measured by HBS (see chart 1), hence the adjustment coefficient derived is about three. To pick-up the example: after applying the respective coefficients, every household that received entrepreneurial income in the HBS has a three times higher level of entrepreneurial income than before adjustment. With respect to quality and reliability of the results it may be questioned if it makes sense to triple the level of every survey income in case of entrepreneurial income.

5 Experimental Results for a National Accounts Income Distribution in Germany

5.1 The income distribution by quintile

The results of the integrated micro data based income distribution in a national accounts framework by quintiles is shown in the subsequent table.

Table 4: Disposable Income as defined in National Accounts according to income quintiles^j – reference year 2008 – preliminary results - National Accounts, German HBS

In Euro	Q1	Q2	Q3	Q4	Q5
Per household / in Euro					
Without adjustment ⁱⁱ⁾	11.100	20.400	28.400	37.600	62.400
Including adjustment ⁱⁱ⁾	11.500	20.900	27.600	37.200	87.600
Change in %	+4%	+2%	-3%	-1%	+40%
Per Consumption Unit (modified OECD scale) / in Euro					
Without adjustment ⁱⁱ⁾	8.500	14.100	18.600	24.400	41.300
Including adjustment ⁱⁱ⁾	8.400	14.200	18.500	24.600	57.900
Change in %	-1%	+1%	-1%	+1%	+40%

i) German Household Budget Survey excludes households with more than 18.000€ net household income per month from the survey design

ii) Adjustments refer to changes in income level of households by multiplication of HBS survey records for income components with adjustment coefficients, cf. paragraph 4

The effect of methodological adjustments can be observed best by looking at the distribution according to the income level, as displayed in table 4. Average disposable income per income quintile is quite stable from Q1 to Q4, while an extreme increase in Q5 can be observed. This adjustment illustrates the effect of high adjustment coefficients in case of entrepreneurial and property incomes and highlights where the shortcomings of the results are concentrated. In contrast, moderate adjustments to wages and salaries on one hand, and slightly higher but still moderate adjustments on income tax and social contributions on the other hand do not lead to major changes in the middle of the income distribution.

5.2 Results according to household subgroups

As from our point of view the household should be the relevant statistical unit for distribution of economic resources, we prefer to use socioeconomic subgroups that refer to household related characteristics. Feasible classification variables in this sense are the household's main source of income and family types. Other or different subgroups based on household related features may be defined depending on the respective analytical focus. On the other hand, sometimes person-related characteristics are proposed to define subgroups of households, which we consider as less appropriate when the focus lies on welfare analysis: Our concern is that there might be misleading conclusions due to an inhomogeneity within the household, i.e. very much diverging socioeconomic features within the same household.

5.2.1 Household income according to the main source of income

To construct the classification variable of the main source of income, primary incomes are summed-up for all persons living in the recorded household and income components are grouped to four income categories which are

- self-employed-income / property income
- wages and salaries
- pension income
- Other transfers (unemployment or social assistance, transfers between households, etc.)

The importance of the respective income category is assessed by contrasting the summed-up household amount between the four categories and identifying the one with the major weight.

*Table 5: Disposable Income as defined in National Accounts – household types according to the main source of income
– reference year 2008 – preliminary results - National Accounts, German HBS*

	Per household / in Euro			
	Wages and salaries	self-employed-income / property income	Pension income	Other transfers
Without adjustment ⁱ⁾	37.500	44.300	24.500	14.900
Including adjustment ⁱ⁾	35.300	114.900	26.700	16.000
Change in %	-6%	+159%	+9%	+7%

i) Adjustments refer to changes in income level of households by multiplication of HBS survey records for income components with adjustment coefficients, cf. paragraph 4

In case of households whose main source of income is wages and salaries, average disposable income per household is declining as consequence of methodological adjustments. This is due to very moderate adjustment coefficients in case of wages and salaries received and slightly higher adjustment coefficients in case of deductions by income tax and social contributions. Households with pension income or other transfers as main source of income show in contrast a slightly higher average disposable income after application of adjustments. Disposable Income for households with self-employed income or property income as main source of income is almost tripling due to very high adjustment coefficients. Households assigned to this subgroup are predominantly shifted to the top of the income distribution by the adjustments carried out. Before adjustments, about one half of the respective households are located in the top quintile, but more than 90 percent are concentrated there after application of adjustment coefficients. Since the OECD basic approach applied in our experimental calculations assumes a proportional under-coverage across all households, it seems to reach its limits in case of households with self-employed or property incomes as main source of income. The question arises, whether it is always feasible to apply the same coefficient to all households that receive the respective income component. While most probably the top income earners are not even participating in household budget surveys, it is certainly plausible that there are actually households living by self-employed income at the middle and even at the bottom of the distribution. By using adjustments coefficients, these poorer households are artificially presented much better off and shifted to the distributional top.

5.2.2 Household income according to family types

According to family types (table 3), average disposable income is rising remarkably over the different groups, especially in case of couples with 2 and more kids. Entrepreneurial and property incomes occur across almost all family types and the respective high adjustments are distributed

over the almost all subcategories. An exception is that of lone parent households where the adjustments play a minor role in comparison to the other family types. An interesting point for welfare analysis is the effect of using consumption units instead of per household figures. In contrast to per household figures, average disposable income per consumption unit declines with a growing number of kids. Furthermore, the economic conditions of lone parent households appear less favourable than according to per household figures. This illustrates again that the use of consumption units, which take into account the household structure and the resulting consumption needs, seems a very useful device in welfare analysis.

Table 6: Disposable Income as defined in National Accounts according to family types – reference year 2008 – preliminary results - National Accounts, German HBS

In Euro	Single Person	Lone Parents	Couple without children	Couple with 1 child	Couple with 2 children	Couple with 3 and more children
Per household / in Euro						
Without adjustment ⁱ⁾	18.800	24.200	37.200	45.000	50.700	52.400
Including adjustment ⁱ⁾	22.100	25.800	43.300	50.000	59.000	63.600
Change in %	+18%	+6%	+16%	+11%	+16%	+21%
Per Consumption Unit (modified OECD scale) / in Euro						
Without adjustment ⁱ⁾	18.800	15.700	24.800	23.700	22.500	19.400
Including adjustment ⁱ⁾	22.100	16.700	28.800	26.300	26.300	23.600
Change in %	+18%	+6%	+16%	+11%	+17%	+22%

i) Adjustments refer to changes in income level of households by multiplication of HBS survey records for income components with adjustment coefficients, cf. paragraph 4

6. Impact of the micro data adjustments on income distribution indicators

When income distribution is analysed, some widely used indicators are the 80/20-ratio (or Q5/Q1-ratio), the Gini-coefficient or the proportion of the population which is exposed to a poverty risk¹³. Information on household income and poverty risk is generally highly sensitive and often subject to a political debate on distribution of economic welfare and on social justice¹⁴. Therefore data quality is of major importance when respective distribution indicators are published by official statistics. The crucial question arising is in how far the adjustments carried out to the micro data do affect the different distribution indicators. The results of our calculations are presented in the subsequent table:

¹³ Cf. Sen (1973) and Stiglitz et al. (2009)

¹⁴ The 80/20-ratio is for example part of the EU 2020 Indicators, defined by the European Commission

Table 7: Distribution indicatorsⁱ⁾ related to disposable Income as defined in National Accounts – reference year 2008 – preliminary results - National Accounts, German HBS

	80/20-ratio	90/10-ratio	Gini coefficient	Share of households with less than 60% of median disposable income
Disposable Income per household (N.A. definition)				
Without adjustment ⁱⁱ⁾	5,6	9,4	0,36	24,0%
Including adjustment ⁱⁱ⁾	7,6	14,9	0,43	23,4%
Disposable Income per Consumption Units (N.A. definition, modified OECD scale)				
Without adjustment ⁱⁱ⁾	4,9	7,8	0,31	17,7%
Including adjustment ⁱⁱ⁾	6,9	12,8	0,40	16,8%

i) German Household Budget Survey excludes households with more than 18.000€ net household income per month from the survey design

ii) Adjustments refer to changes in income level of households by multiplication of HBS survey records for income components with adjustment coefficients, cf. paragraph 4

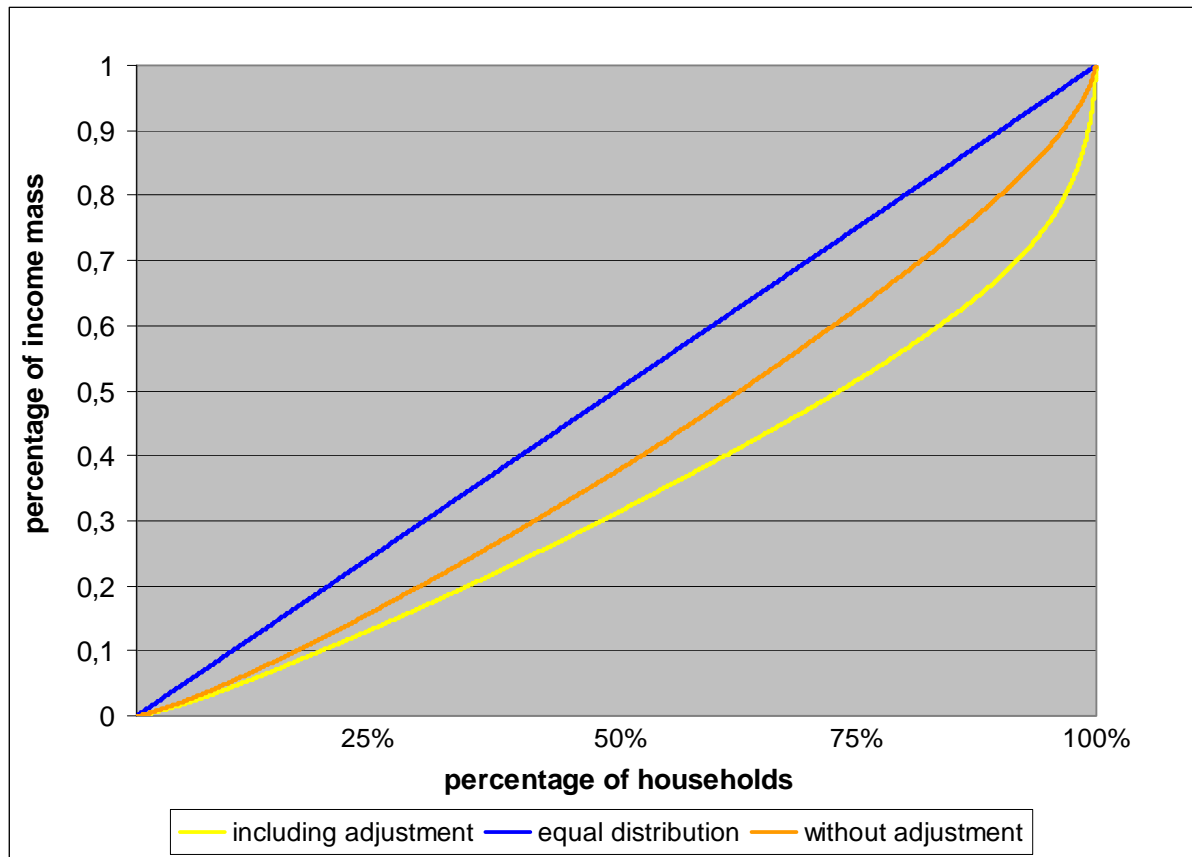
As shown in table 7, as a consequence of methodological adjustments the 80/20-ratio increases remarkably and even more the 90/10-ratio. Due to high adjustment coefficients resulting from the micro-macro-adjustment of entrepreneurial and property incomes (see Chart 1) there is a high volume of additional income attributed to a relatively small group of households¹⁵. The respective households and their income are shifted to the top of the income distribution by application of adjustment coefficients, even if before they were located somewhere in the middle or even at the bottom of the distribution. By consequence of the substantial level-adjustments in case of entrepreneurial and property incomes, the income distribution is mainly changed at the top while the middle of the distribution is remaining more or less stable. This leads furthermore to the somewhat paradox picture that according to the Gini-coefficient inequality is remarkably rising while the proportion of the population which is exposed to a poverty risk is even declining. As the Gini-coefficient is based on the Lorenz curve, it refers to the entire income distribution. As illustrated in Chart 4, the additional income amount attributed by adjustment coefficients is changing the Lorenz curve towards a stronger skewness to the distributional top. The surface between the equal distribution line and the Lorenz curve to which the Gini-coefficient refers to is thereby inflated. By contrast, the poverty ratio based on the median income is declining (slightly) since the median does not change very much¹⁶, but a certain number of households is lifted

¹⁵ Cf. also the increase of disposable income per household before and after methodological adjustments as displayed in Table 5. The rate of change for the 3 millions of households with main source of income self-employed income or property income is 159%.

¹⁶ The median of equivalence weighted disposable income is declining from 18.600€ to 18.400€ while the mean is rising from 21.400€ to 24.900€ and the standard deviation from 14.100€ to 27.900€.

beyond the poverty threshold due to the high adjustment coefficients for self-employed and property incomes.

Chart 4 –Lorenz Curve related to Disposable Income as defined in National Accounts reference year 2008 – preliminary results - National Accounts, German HBS



In a wider perspective a question may be raised about the limitations of the OECD basic approach. On one hand it seems obvious that in case of small differences between the grossed up survey data totals and the national accounts figures the resulting distributional information compiled in the frame of national accounts is a feasible approach. But in case of bigger differences between the two data set income totals there may be doubts with regard to bias and reliability of the income distribution data produced. From this it seems to follow, that the first option in case of bigger differences is to improve the data situation.

7. Conclusions

For the sake of international comparability the most appropriate income concept is adjusted disposable income from national accounts, since it includes social transfers in kind (STIK) and insofar assures comparability of data in a world with diverging welfare regimes and institutional

differences. If the analytical issue is mainly to contrast welfare situation in different countries, per capita or per household figures may be sufficient.

Since the micro distribution of STIK-components mostly has to be imputed, appropriate distribution methods have to be chosen to avoid the risk of misleading conclusions with respect to economic conditions of households. With regard to social insurance benefits, the paper argues in favour of a modified insurance value concept as a basis for the imputed micro distribution which makes no differences between individual risk profiles. By contrast, in the case of education the actual use approach is preferred.

Generating an income distribution in national accounts is an endeavour which depends on successfully integrating micro and macro data. The paper shows how in practice results for an income distribution by households groups in a national accounts framework can be obtained by integrating micro data from a household budget survey and following the OECD basic approach.

The example presented in the paper showed that an important preparatory step consists in developing solutions to cope with the conceptual differences between macro and micro data (e.g. households excluded like institutional or high income households) to reduce the residual/empirical deviations as far as possible. In Germany some work needs to be done in the case of entrepreneurial and property incomes as well as of separating the household sector from non-profit institutions serving households (NPISH).

The fact that distribution indicators like the 80-20-ratio or the Gini-coefficient are substantially influenced by methodological adjustments seems to indicate possible limitations of the OECD basic approach.

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