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Documents

Use of HBS-data for estimating Household Final Consumption Final paper from the project

Paper building on the work done in the Eurostat Task Force 2002

1. Executive summary

The project aimed on investigation of methods to give better estimates of household final consumption based on data from the household budget survey.

One main problem in the use of the household budget data is that richer and the very richest households tends to be underrepresented or not represented at all in the surveys.

The solution of this problem is found to be a reweighting or adjustment of the household budget survey data by utilizing external data from other sources.

The project consisted in experimental work in eight candidate countries, where different adjustment methods and external data sources where tried out.

The main conclusion of the project is, that a reweighting or adjustment is possible and has a positive effect on the resulting national account estimates.

2. General description of the problem and its solution

Underrepresentation of rich households

The main problem, which this project has concentrated on, is the fact, that the richer and the richest households tends to be under-represented in the HBS – the very richest (including the Bill Gates types or the mafia-bosses) may probably not be represented at all. As these rich households is believed to have a very high consumption the result will be significantly too low figures for total consumption.

Reasons for the underrepresentation

The possible under-representation of the rich households can have more reasons:
The rich households tend to have a higher non response-rate.
The contact rate for the rich households may also be lower – e.g. if they live in a secondary residence part of the time.
The sample frame used for the HBS-sample may not cover the rich households sufficiently – this could be the case if the sample frame for the HBS is another sample including a micro census.

Poor households may be underrepresented as well

Poor households may be under-represented in HBS, too. But the impression is that this problem is of minor significance, so it was not dealt with by the TF.

To this comes that the weighting schemes already used in most countries' HBS is likely to correct more efficiently for the bias in the low income end than in the high income end, due to the fact that the low income groups probably are more homogeneous in respect of the usually used demographic, socio-economic and geographic weighting factors than the rich households.

For example: If you have a household with just one adult who is out of work (student, unemployed or pensioner), who is either very young or very old and who lives in a poor part of the country (including parts of the capital city), then the probability for this household being poor will probably be very high. This means that a weighting based on these background factors will adjust efficiently for the under-representation of these household types. On the other hand the very richest are often found among the middle aged or elderly self-employed or employees on the highest level (directors, etc) in richer areas of the country. But a weighting according to these factors will probably not be so efficient as the groups defined in this way will consist of the very richest, but also many higher middle class households or even some poor households. Especially the self-employed are a very inhomogeneous group in respect of income and hence consumption.

The aim of the project: to improve the NA – not to improve the HBS

It should be stressed that this project was on a better utilization of the HBS data for NA purposes. Improvements were achieved by adjusting the data using external data sources. But the HBS will still be influenced by e.g. under-representation and measurement-errors. So in the construction of the HFC other data sources of parts of consumption should be used if they are regarded to be of a higher quality. In a country where good statistics on, say,

total consumption of cars, this statistics should be used instead of the grossed-up HBS data on car consumption.

The solution: Reweighting and adjustment

The main solution of the problem was to introduce of a kind of re-weighting and adjustment of the existing HBS-data with a special emphasis on the richest.

Two types of adjustment

A twofold re-weighting or adjustment system seems to be the best solution.

Usually a weighting procedure of the HBS-data is used before the results are published. But in most cases the weighting scheme is based on demographic, geographical or socio-economic factors as labour market status – but not directly on income. To the degree that the weighting factors are strongly correlated with income and thus consumption the weighting can be efficient. But in the opposite case where the correlation – especially for the rich households – is regarded as weak, the weighting will not solve the problems of under-representation of the rich and the very richest households.

So a improvement of the weighting schemes including the use of external data on incomes or on other variables correlated to incomes will make the bias caused by the underrepresentation of the rich households smaller.

For the richest households in the country – households who will normally not be represented in the HBS-sample at all, such a reweighting will not solve the problem, so a supplementary adjustment procedure will be.

Shortly the idea of the two steps of adjustment is to:
- Supplement the already used re-weighting schemes – may it be post-stratification or calibrations– by integration of income or income-correlated data. This supplementation can be done in two ways: by directly integrating the income data in the post-stratification or calibration, or alternatively by making a new income based re-weighting on the already weighted dataset.
- To estimate the consumption for those very rich households, who are not represented in the sample and then add this 'extra consumption' to the calculated HFC.

3. The project's phases

The project's phases

Based on these ideas the work in the task force was set up comprising eight candidate countries – Bulgaria, Estonia, Latvia, Lithuania, Romania, the Slovak Republic, the Czech Republic and Slovenia.

From each country there was an active participation from NA-experts as well as HBS-experts.

The work was lead by two external experts and Eurostat.

The work in the task force included the following main steps:

- Each participating country analysed the possibilities of using external data sources – that is the possible data sources were found and the possibilities of getting access to them were investigated.
- On the basis of reports on these possibilities from the countries to the first task force meeting an agreement with each country was made on which kind of experimental work could be carried out.
- In the spring 2000 then each country made one or in most cases several experiments by using different adjustment schemes and different external data sources.
- The results of the experiments were reported in reports to the second task force meeting. The reports included a description of the data sources and the reweighting, comments on special problems found in the experimental phase and an evaluation of the results obtained. Unfortunately the work in the Czech Republic was delayed so a report was not received before the second task force meeting, and it has not been possible to include the Czech experiences in this paper.
- The second task force meeting discussed the results from the experiments and based on these discussions and findings a set of recommendations is now set up in this paper.
- For some of the countries the second task force commented on things in the reports that should be clarified, etc. – and the countries did this after the task force meeting.
- As a supplement to this the countries made an update of the analytical tables showing the construction of the NA-estimates based on the HBS and other sources. This update was followed by a report from each country.

Extra result:
Better cooperation
between NA and HBS

Besides the conclusions drawn directly by the project and the experiments another important result was achieved:

The work connected with the experiments carried out has in some countries lead to a much more direct cooperation than usual seen between the NA-people, the HBS-people and statisticians, experts, etc. from other areas.

Such a close cooperation seems to be very positive and useful for all included – so it should go on and deepen in the future. The project work has also increased the attention of NA and HBS people to the quality of the data they produce.

It is strongly advised that this close cooperation is continued in the future.

4. Problems, conclusions and recommendations

In the summary table in Annex 1 the main results from the seven countries is presented.

Two types of
adjustment

As mentioned above two main types of reweighting has been used:
- A reweighting by including income data or income correlated data in the reweighting scheme – may it be a poststratification or a calibration.
- An adjustment 'on the top' for those the very richest households not represented in the HBS sample at all.

Different data sources

In addition to these two main types of methods come several different kinds of data sources:

– Tax data
– Another survey with income data - could be a wages and salaries survey
– Data set with income correlated data – in this case car registers
– Expert assessments

In addition to these methods and types of data sources come experiments on using more than one method/source at the same time.

In this section it is tried to isolate the most important experiences and conclusions gained by the experiments in a set of recommendations.

General conclusion

*General conclusion:
Reweighting/
adjusting helps*

The first main conclusion is, that reweighting and adjusting in fact is relevant and improves the estimates of total consumption. For all countries and methods - except two - the result of the different procedures has been a lift in the estimates of total consumption.

On the same time it can be seen that the change in the estimated total consumption is very different for different countries and methods – and so is the underlying changes for the separate COICOP consumption groups.

You can point out three main reasons for the very diverging results:

– The external data sources and the implementation of the reweighting/adjustment is different
– The underrepresentation of the rich households may have a different magnitude in different HBS – and if the underrepresentation is not very big the reweighting will probably not have a very big impact
– The real distribution of incomes in the countries is not the same – in a country with a less unequal income distribution the impact of the reweighting will tend to be lower.

*Reweighting should be
done in all countries –
but methods, etc. will
be different*

The main conclusion: that you can do something to solve or reduce the problem, can be extended to the recommendation, that the specific possibilities and practical ways to do it is very country specific and therefore requires further country specific analysis.

These recommendations should be understood not just in a static sense. The analysis should not just be carried out once and for all, but should be regarded as a permanent process. This implies that the countries should permanently look for suitable external data sources and should continue the work on improving the weighting schemes.

*Just regard the
reweighting as a
reweighting for the NA*

The reweighting and adjustments dealt with in this project is done solely for NA-purposes. Maybe the methods can also be useful for the HBS as such – and maybe not. So just a thorough analysis can show if the methods should be used for HBS-purposes as well.

An example could be an improvement of the estimates for NA-purposes by reweighting with a survey on wages. But for the HBS as such this might

course problems for tables where you compare wage earners with self-employed, pensioners, etc.

If a suitable data source does not exist or you cannot access it – do not give up!

The main practical problem in many countries was simply to get access to relevant external data sources.

Of course no general solution on this important problem exists – it will depend totally on the existence of such data sources and on the practically and legally obstacles the statistical bureaus may face, when they try to get access to them.

But it will be hoped that on the one hand a permanent awareness of new possibilities, new surveys, changes in old surveys, new registers, etc., and on the other hand constant pressure on the relevant authorities, etc., from the statistical bureaus will in the future give better and better possibilities. In for example Slovenia pressure on the tax authorities resulted in access to the tax data.

Just a thoroughly analysis of the external data sources and methods can decide what to do

Some countries have several possibilities when choosing which external data sources to use.

And also the practical use of the data source can be done in more different ways.

The problem therefore arises: how to chose between different sources? What cannot be recommended is just to choose the source and method that gives the highest change in the estimates. Such a method seems very unscientific.

In stead a very close analysis will be necessary: What is the coverage of each data source? How is the nonresponse rate? Which kind of underreporting and other measure errors influence the data source, etc.?

The same holds for the different possible practical uses of the source – it cannot a priory be decided what is best – very specific analysis has to be made in each country.

Do not stop the work on improving the HBS when the problem of the rich is solved

The problem of the underepresentation of the rich is one important problem in the HBS in the candidate countries and in many (all?) other countries as well. But many other problems in the HBS will remain even though you should succeed in solving this problem.

Especially non-sampling errors are important and dangerous, as they will normal course a bias in the final estimates. So the methodology, the instruments, etc., in the HBS should constantly be improved – even though budgetary restrictions can make it difficult!

Recommendations on the reweighting schemes

There exists several possible reweighting schemes – often grouped into poststratification methods and calibrations methods.

For both groups of schemes there exists several computer packages, etc., that can be used building on maybe not exactly the same algorithms. Romania e.g. uses CALMAR, which is based on SAS macros.

And for all methods there will be several options to choose between, e.g. exact which income brackets should go into the calculations, etc.

In the literature or elsewhere you cannot find one common recommendation on exact how to do the reweighting – but what so ever you choose to do, the final results will probably not differ very much.

Therefore maybe the best recommendation should be, that you do as you are used to (if you are familiar with some kind of reweighting) – but just include relevant external data sources. It will give you the best knowledge of what is in fact happening, and it will save time and money, as you maybe not must invest in new computer packages, etc.

In most countries the HBS data is already weighted against external data – typically demographic and geographic data building on the census or other sources.

If the new weighting for income or income related data is done 'on top' of the already weighted data, the original weights will be damaged. The result will be, that now you have a dataset where there is a good correspondence according to income – but maybe a not so good correspondence according to age composition, regions, etc.

To avoid this, it is recommended to integrate the new weighting with the traditional weighting. In this way it can be assured, that the income or income related factors as well as the demographic, etc., factors corresponds to the population.

This integration can be done by including the new variables in the calibration or in the definition of strata in the poststratification.

If such an integration of the old and the new reweighting schemes is not possible, it is recommended after the new reweighting to check the final results against external data sources.

This can rather easy be done. For instance you can make a table of the age distribution or the regional distribution in the final reweighted HBS data and compare it to census data or some other external source.
Such a comparison will show differences, so the further analysis should concentrate on an evaluation of the impact of these differences for the final NA-related estimates.

Bulgaria provided estimated age distribution and compared it with the census. After the reweighting of data the age structure remained almost the

same as the original age structure in HBS. In general the age structures from the HBS and the Census were relatively similar. The highest underestimation concerns persons on the age from 25 up to 29.

If consumption is very strong correlated to the new external data, say income, but weaker correlated to demography and geography, the problem will be small, so the new reweighting will give better estimates for the NA. But if the correlation between the new data source is not very strong compared to the traditional external data, there could be a problem. Such situation could, say, be seen if the new weighting is done against a car register. If such a register just has information on the possession of cars – but not on the age, type, etc., of the car, the correlation may be very weak in some countries. The opposite could be the case if the register directly gives the possibilities of dividing the cars into different types according to price, age, etc.,

Make the adjustment method as automatic as possible

The kind of adjustments we are looking for will in most or all cases be of a somehow arbitrary character. That is maybe not a problem – but to on the one hand avoid or minimise personal judgments, and on the other hand ensure that the decisions taken one year will be taken in an adequate way also in subsequent years, it is recommended to find ways of automation of the reweighting process.

An example from Denmark: In the poststratification used the potential number of strata is very big, but the actual used number of strata is much smaller. But the exact decision of which strata to use and which to collapse with neighbouring strata is not taken by the statistician but by the computer program used on the basis of the exact compositions of this year's households in the HBS and on some general formulated algorithms.

Not just make the reweighting for the rich

The scope of this project has been to find ways to solve the problem of underrepresentation of the rich and the very richest households.

But even so it should not be forgotten that the HBS will probably suffer from underrepresentation of other population groups as well – it could be the poorest or the eldest, who also often have low incomes.

It would not be a scientific way of producing statistical estimates just to reweight for the underrepresentation of the rich – although it is tempting, because it gives higher final adjustments. If possible depending on data sources, etc., the reweighting should include the whole population – but of course when defining the relevant income brackets, etc., a special emphasis should be put on the rich.

If you just adjust for the rich there can be – at least – two dangerous consequences: You make a too high adjustment (and hence spoil the final estimate of total consumption) or you disturb the consumption distribution by probably getting relatively too high figures for luxury goods, etc.

Before using the reweighted data try to compare them with other sources

Even though the external data source and the methods for reweighting seem to be good, you can never be completely sure. So it is not enough to analyse

the data source as such and the methods – you also have to analyse the final computed gross results.

For some parts of consumption other reliable external data exists – so the adjusted HBS-figures should be compared to them.

Of course it is not recommended just to regard the NA-figures as the true figures and then just compare the adjusted HBS-figures with the NA, as the whole problem is that the NA – to some degree caused by deficits in the HBS – is underestimated!

Do not give up if the reweighting is not equal good for al consumption groups

Often – especially if you use a specialised external data source as a car register – the adjustment coming out of the reweighting process will be very different for different consumption groups. The resulting relative consumption distribution may rather easy be more wrong than in the unweighted data.

But this does not mean that the reweighting is useless.

The NA uses many other data sources than the HBS. So if it is possible to isolate the consumption groups, where the adjusted figures seems to be more correct than the unadjusted, then they should be used for NA purpose.

And for those consumption groups, where the adjustment seems to make things worse, the reweighted figures should not be used.

Adjustment 'on the top' for the very richest

Supplement the reweighting with an adjustment 'on top' for the very richest

The reweighting gives a weight to all households in the HBS in a way, so that underrepresented household types become a relatively high weight.

But a special problem arises for the very richest households in the population. If real households exist, that have an income substantially higher than the highest income found in the survey, you cannot find any survey household that can represent these very rich households in a proper way.

As these the very richest are assumed also to have a substantial higher consumption – and another consumption pattern – than the not so rich, there should be carried out an adjustment for this non-representation in the survey.

To make these adjustment three types of information is normally needed:
– An idea of how many of these, the very richest households, there is in the population
– An idea of the income distribution among these households – or alternatively an idea of the average income among these households
– An idea of the propensity to consume in total and into consumption groups (consumption as function of income) for these household

If this information is available the adjustment in consumption for the very richest is simply calculated as

number of household * income of these households * propensity to consume

The problem is, that this necessary information is not available. If you have access to good tax based register you may have data on the number of households and their income – but you will never have information on their consumption. Therefore it will be necessary to rely on estimations

For the number of the very richest and their income it may be possible to get some estimates from tax authorities, banks, accountant firms, etc.

For the consumption pattern a kind of extrapolation based on data from the richest households found in the HBS could be the basis.

The result of this adjustment 'on top' of the reweighted HBS will always be rather arbitrary – but still it can improve the final estimates for the NA.

Recommendations on how to choose the best external data source

Normally use the most comprehensive and general data source

For the experiments tax data, other income data, expert assessments on income and consumption and car registers has been used.
It must all other things being equal be assumed, that the most general and comprehensive data source will be best. Such a best data source will in many cases – now or in the future – be the tax based registers, if it covers the whole population and if the quality is regarded as high, that is underreporting not playing a very big role.

In the other end of the scale you can assume that you will find the car register or similar registers, as it has a much less general character – it is much more one-dimensional, so to say. The possession of cars is correlated with income – and hence with consumption in general (not just on transport) – but the correlation may be rather week. The data source in practice gives just the possibility of reweighting using a very few strata (no car, one car, two cars, more than two cars), compared to the tax data, where you, if you have access to micro data, can construct as many brackets as desired.

How to in practice choose the data source will depend on very practical analysis done with open face.

An example could be on the use of a car register: Some may feel that possession of cars is related to income, while other may feel that this is not so. But then you have to analyse the problem and not just rely on feelings and guesses. And it is often rather easy to check the ideas by using the HBS data itself – in the example to measure the correlation between car ownership and income among the HBS-households.

If necessary and possible make adjustments to the external data source

If the possible external data source is regarded as suffering from underreporting or other deficits (as it could very well be the case for a tax register) it should be investigated if there is any possibility of making adjustment to the external data source as such before using it in the reweighting.

These kind of adjustments will often have to be based on a set of assumptions, estimates, etc., - but even though the method can be felt a little arbitrary the final result may improve the NA-estimates.

Very often the actual possible data sources are not ideal at all.

Maybe the external statistics as such is of high quality, but the definitions and concepts used in the source do not match the HBS. An example will be the tax register based income figures. The income concepts used here will be defined by tax legislation and will not be the same as the income concepts in the HBS.

Another problem, which was very often seen in the experimental work, is, that the external data source uses a different unit than the HBS. Typically it will be person (individual) based, while the HBS is household based. And even if the external source is household based, the definition of the household will probably diverge from the HBS-definition.

In such cases further analysis will show how you can best overcome such problems – no general solution can be given. One solution could be to find the ratio or other correlation between the concepts in the two surveys and then make adjustments to the external data. Introducing a kind of imputation could do this.

For the person/household problem there exists different ways of producing household weights on basis of personal weights – some of these method are described in the literature, and some are tried out in the experiments in the CC.

We are mainly interested in household level variables in the HBS, and most of the variables in the HBS are measured on household level. These imply that ideally we would post-stratify or calibrate against a distribution for households for the population. However, the register variables are seldom available on household level for the population. Thus it is rarely possible to post-stratify or calibrate against a household distribution.

Common practise is to calibrate using the distribution for persons. In e.g. Estonia they calibrate using income for each person in the household. One method is to compute the average of the calibration variable for the household, and then use this average as the calibration variable for each person in the household. This method will give identical weights for each person in the household.

Note that the described algorithm will not result in weights identical to calibration against the household distribution for the population.

For continuous variables such as income it will probably be ok to use the person distribution as a substitute for the household distribution. Categorical variables such as number of cars are probably more problematic. For such variables you will lose more information by using data on person level in place of data on household level.

However, in Lithuania they managed to improve their estimates by using the car-register.

Another possibility (used in Denmark) is to find a common denominator: In the tax file the income records are person based and in the HBS they are household based. But for both sources we know the address of the persons/household. So instead of directly compute a household weight, first an address weight is computed. Afterwards this address weight is distributed to the maybe more than one household living at that specific address. Such a method can be good if the number of cases, where the address actually comprises exactly the persons in the HBS-household, is rather high – but if the differences are found too often, the results will be worse.

Some data sources cannot be used at all

The experiments showed – not surprisingly – that in some cases the external data source – even though it in principle should be usable – in practice could not be integrated in the adjustment.

An example is in the Slovak Republic, where information from the foreign trade statistics on imports of planes and ships could not be used as it was not possible to estimate the part of the import going to private households and the part going to others – business, sport clubs, etc.

In some cases use more than one data source on the same time

In some countries there exist a good survey on wages and salaries. This can give a god reweighting for a part of the population – but cannot help if the underrepresented rich households are self employed – as many probably will be.

Other examples of the same kind could be tax registers just having income figures for parts of the population, or data sources not covering the entire geographical area.

So in such cases where the data source just covers some of the population, other data sources covering other parts of the population should be sought for to be able to 'fill up' the whole population.

As in the Lithuanian case, you could after more analysis maybe assume that the reweighted figures for transportation, for restaurants and hotels and maybe for other groups are better taking care of the car owners probably being richer. But it does not seem very reliable that housing costs go down after the reweighting – so for housing the reweighted figures should not be used. But this might also be an indication of another problem with the figures on housing, which should be carefully investigated!

The method used in Romania use the survey on wages and salaries to estimate expected income for various types of occupation. These estimates are higher that the corresponding estimates based on HBS data. The estimated income for the survey on wages and salaries are used to adjust the observed income in the household. Furthermore, the observed consumption in the household is than adjusted accordingly. This method may adjust for measurement error more than adjusting for under-representing of the rich.

Expert's opinion   If no real external data source (register or survey) exists the adjustment will have to be based on some estimates from experts or what you can find.

This has been tried out in more countries, e.g.:

In the Slovak Republic the income from the richest was estimated on the basis of information on the size of bank deposits above a certain limit, and estimates of the income connected to these deposits to get estimates of the income of the very richest.

In Latvia the number of the very richest was estimated using data on the number of enterprises with more than 100 employees and on the number of top civil servants.

If possible reweight against different data sources and with different solutions of the practical problems   One way of checking the solidness of the new reweighted estimates will be to compare it to estimates computed in another way by using other data sources.

So if possible you should make a series of different adjustments. If they more or less give the same results – or if the direction of the adjustments goes the same way for the totals and for the different consumption groups, you can feel a little surer that the reweighting works properly.

If the results are very diverging – or if the direction of the changes in the different consumption groups are different – this may give you some hints of the underlying problems and hence of the solution.

The resulting final adjustment could in some cases maybe be a kind of average between different adjustment methods.

5. Final conclusion

The final conclusion will simply be, that it indeed is possible to use the HBS for NA-purposes in a more efficient way. Probably the new estimates will not be perfect – but they will be better! This holds for the Candidate countries – but also for other EU- and Non-EU-countries.

The exact way to improve the estimates for the NA is very country dependent – and what is not possible for now will maybe be possible within some years. Therefore the recommendations in this paper should be used for very precise and ongoing analysis in each country.

The further work on this issue should – by nature – be the responsibility of the NA-experts in the country. But a very close cooperation with the HBS-experts is necessary, as it very often will be the HBS-experts who actually can make the reweighting, etc.

Annex 1
Summary table

Table 1a Summary of tables on HBS - change in percent for different adjustment methods

	Slovakia		Estonia				Latvia	
	Adjustment for rich[1]	Adjustment for rich[2]	Calibration with tax data 1[3]	Calibration with tax data 2[4]	Calibration with LFS[5]	Imputation with household picture[6]	Adjustment for the richest[7]	Post-calibration with expert assessments on the richest[8]
Total consumption	**22**	**22**	**4**	**4**	**1**	**0**	**3**	**2**
01 Food and non-alcoholic beverages	8	11	2	2	0	2	.	1
02 Alcoholic beverages, tobacco, narcotics	15	17	5	0	2	-1	.	3
03 Clothing and footwear	31	38	5	5	2	-10	.	3
04 Housing, water, electricity, gas, etc.	18	21	3	3	1	10	.	1
05 Furnishings, households equipment, etc.	34	51	6	6	3	-7	.	7
06 Health	29	28	2	2	3	9	.	3
07 Transport	41	19	7	7	4	-10	.	4
08 Communications	16	23	4	4	2	-3	.	3
09 Recreation and culture	20	27	6	6	1	-1	.	4
10 Education	19	23	0	0	0	-28	.	2
11 Restaurants and hotels	46	17	5	7	3	-13	.	7
12 Miscellaneous goods and services	32	41	5	5	1	-7	.	3

[1] Adjustment according to tax data described in "Estimates of Private Household consumption focused on rich households Slovak Republic, Adjusted final report". The computation is based on data from the analytical tables, moreover (column 2 in table 1)/(column 1 in table 1).

[2] Adjustment according to information from Institute for public question and data from the National Bank of the Slovak Republic described in "Estimates of Private Household consumption focused on rich households Slovak Republic, Adjusted final report". The computation is based on data in the analytical tables, moreover (column 1 in table 3 + column 2 in table 3 - column 1 in table 1)/(column 1 in table 1).

[3] Adjustment described in " Report on the experimental estimates on re-weighting HBS data". The computation is: (columns 3-column 2)/column 2 in table 1 on page 10 in the report.

[4] Adjustment described in " Report on the experimental estimates on re-weighting HBS data". The computation is: (columns 4-column 2)/column 2 in table 1 on page 10 in the report.

[5] Adjustment described in " Report on the experimental estimates on re-weighting HBS data". The computation is: (columns 5-column 2)/column 2 in table 1 on page 10 in the report.

[6] Adjustment described in " Report on the experimental estimates on re-weighting HBS data". The computation is: (columns 6-column 2)/column 2 in table 1 on page 10 in the report.

[7] Adjustment on top for the richest, see page 10 in " Report on the experimental estimates on re-weighting HBS data".

[8] Described in the report "Use of HBS data for estimating Household Final Consumption". The computation is based on data from the table on page, moreover column 2/1.

Table 1b Summary of tables on HBS - change in percent for different adjustment methods

	Bulgaria		Lithuania[2]		Romania[4]		Slovenia	
	Weighting against survey on wages and salaries 1[1]	Weighting against survey on wages and salaries 2[1]	Re-weighting with earnings distribution survey[31]	Re-weighting with car register[3]	Re-weighting with living condition survey	Re-weighting with wages and salaries survey	Re-weighting with car register[5]	Re-weighting with tax data[6]
Total consumption	4	4	1	9	-8	11	2	0
01 Food and non-alcoholic beverages	2	2	0	4	-7	9	1	2
02 Alcoholic beverages, tobacco, narcotics	4	4	0	9	-8	10	-7	-6
03 Clothing and footwear	6	6	1	16	-13	14	2	1
04 Housing, water, electricity, gas, etc.	3	3	0	-1	-7	11	1	2
05 Furnishings, households equipment, etc.	6	5	1	9	-6	8	0	-1
06 Health	4	4	1	-4	-4	9	2	3
07 Transport	7	7	1	41	-13	15	8	1
08 Communications	3	3	1	14	-10	14	-3	-5
09 Recreation and culture	6	6	2	18	-15	14	-1	0
10 Education	9	9	2	7	-21	14	-5	-6
11 Restaurants and hotels	6	6	1	20	-18	17	-1	-2
12 Miscellaneous goods and services	5	5	1	12	-9	14	-2	-9

[1] Described in the report "Project: Use of HBS data for estimating Household Final Consumption". The computation is based on the table on page 8 in the report.

[2] In Lithuania it has also been tried to adjust by doubling the weight for households in 10. Decile. This method seems lack empirical basis.

[3] Described in the report "Experimental Estimates on Re-weighting the HBS Data". The numbers are taken from the table on page 8 in the report.

[4] Described in the "Report on the experimental estimates on the re-weighting HBS data". The computations are based on data from annex 1 in "Report on the analytical table". Also a combination have been tried - the results are somewhere in the middle

[5] Described in "TASK FORCE: Use of HBS data for household consumption in Slovenia, 1999". If the reweighting is done for all households the impact is negative - reweighting just for the richest gives the figures in the table.

[6] Described in "TASK FORCE: Use of HBS data for estimating Household Final Consumption, Re-weighting of HBS data with tax authority data in Slovenia".

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