HOUSEHOLD FINAL CONSUMPTION EXPENDITURE DISTRIBUTIONAL ACCOUNTS: HARMONISING MACRO AND MICRO DATA[1]

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Abstract. Well-being is a multidimensional concept including income, consumption and wealth and their measures are crucial to the design of economic and social policies. Aggregate measures and average values fail to capture the disparities existing among different types of households, which remain far from homogeneous.
Average values are meaningful statistics, but they do not tell the whole story about living standards.
The reconciliation of micro and macro data on households is essential. Micro data sources, can provide distributional information among households but they may not be consistent across the primary components of economic well-being and may not be comparable across countries. In contrast, the system of National Accounts provides comprehensive, consistent and internationally comparable information but it cannot provide any evidence on distribution of economic resources among groups of households.
To bridge macro and micro data, National Accounts values can be combined with distributional indicators from micro data sources, carefully accounting for potential differences in definitions and concepts between macro and micro aggregates.
This paper aims to harmonise micro and macro data as a first step toward developing experimental distributional estimates for household consumption, based on National Accounts data as well as on survey data for consumption (HBS).

1. Introduction

Measuring the level and evolution of economic inequality means attempting to assess people's living conditions and well-being of individuals and households (Blanchet, Chancel, Gethin, 2019). Well-being is a multidimensional concept including income, consumption and wealth and aggregates and average values are unable to capture disparities between different types of households (Lustig, 2018).

The reconciliation of micro and macro data on households is crucial. In fact micro data sources (surveys or administrative records) can provide distributional

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information among households but they are not consistent across the primary components of economic well-being (e.g. income, consumption and wealth) and not comparable across countries. On the other hand, the System of National Accounts provides comprehensive, consistent and internationally comparable information but it cannot provide any evidence on distribution of economic resources among groups of households (Fesseau and Van De Ven2014).

The distributional accounts are a key issue: information in line with National accounts totals (Zwijnenburg, 2022) and able to provide data on the economic resources distribution across households (Coli *et al.*, 2022).

In order to bridge macro and micro data, National Accounts values can be read jointly with distribution indicators from micro data sources, paying attention to the fact that that macro aggregates may not fit the micro aggregates in terms of definitions and concepts. Adjustments are needed to integrate micro information into System of National Accounts framework.

This paper aims at harmonising micro and macro data that is the first step to compile experimental distributional estimates for household consumption. It is based on National Accounts Household Final Consumption Expentiture (HFCE) data as well as survey data for consumption (HBS).

2. The macro and micro perspective: similarities and differences

The first step to achieve this goal is to develop a good understanding of the differences between micro-sources (HBS) and macro-sources (HFCE). Such differences arise not only from the scope of what is considered consumption, but also they also from in the varying classifications and other adjustments that are specific to each source (OECD, 2020).

To ensure international comparability, both the HBS and the HFCE are based on the harmonized international classification of expenditure items, Classification of Individual COnsumption by Purpose (UNSD, 2000) – Coicop, but they follow two different regulations: HBS is based on Regulation (EU) 2019/1700, Integrated European Social Statistics; National Accounts are based on "European system of accounts ESA 2010" (Eurostat, 2013) that is an internationally compatible accounting framework for a systematic and detailed description of total economy (that is a region, country or group of countries), its components and its relations with other total economies.

The HBS focuses on consumption expenditure behaviours of households residing in Italy. The survey analyses the evolution of level and composition of household consumption expenditure and it represents the informative base for the official

estimates of relative and absolute poverty in Italy and for the inflation measure by household expenditure classes.

The focus of the HBS is represented by all expenditures incurred by resident households to purchase goods and services exclusively devoted to household consumption (including self-consumptions and imputed rentals); every other expenditure for a different purpose is excluded from the data collection (e. g., payments of fees and business expenditures).

ESA 2010 defines final consumption expenditure as the expenditure incurred by resident institutional units on goods or services used for the direct satisfaction of individual needs or wants or the collective needs of members of the community.

In NA, final consumption expenditure is calculated as total expenditures made by all households, resident or not, within the economic territory and adjusted by adding the expenditures of residents abroad and subtracting the expenditures of non residents within the economic territory.

According to the ESA 2010 definition, household final consumption expenditure includes the following items that are not detected or differently treated in the HBS:

1. services of owner-occupied dwellings;
2. income in kind,
3. financial services directly charged and the part of FISIM used for final consumption purposes by households;
4. insurance services by the amount of the implicit service charge;
5. pension funding services by the amount of the implicit service charge;
6. illegal activities as narcotics, smuggling of tobacco and prostitution;
7. tips

Instead household final consumption expenditure excludes:

1. social transfers in kind,
2. items treated as intermediate consumption or gross capital formation

Table 1 highlights the differences between HFCE and HBS, along with all the items involved. This analysis needs to be conducted for the 41 Coicop groups (3-digit) to better understand and detail all the discrepancies that must be addressed. While not all categories are a, some groups in those involved require more in-depth analysis during the harmonization stage.

Own final consumption in agriculture is similar in terms of concept in both domains, but different in estimation method. Illegal activities and FISIM in CP02 and CP12 (smuggling of tobacco, narcotics and prostitution) are not detected in HBS, but included in HFCE. In CP04, imputed rents and major maintenance of dwelling need to be discussed: the estimation method is different between HBS and HFCE for the first item mentioned, while the second one is not included in HFCE. In CP07, second-hand cars exchanging between households are excluded in HFCE but

included in HBS (considered as an expenditure as well). Definitions are different also for gambling (CP09) and insurance (CP12).

Table 1 – *Differences in definitions and concepts.*

Division		Group		NA	HBS
CP01	**Food and non-alcoholic beverages**	CP011	Food	Own final consumption of agricultural products: estimated on the basis of statistics on agricultural production	Own final consumption of agricultural products: quantities are detected by the HBS
		CP012	Non-alcoholic beverages		
CP02	**Alcoholic beverages, tobacco and narcotics**	CP021	Alcoholic beverages		
		CP022	Tobacco	Smuggling of cigarettes included	Smuggling of cigarettes not detected by the HBS
		CP023	Narcotics	Included in NA	Not detected by the HBS
CP03	Clothing and footwear				
CP04	**Rents, fuels and maintenance of the dwelling**	CP041	Actual rentals for housing		
		CP042	Imputed rentals for housing	Estimated by applying market rents to the housing stock	Imputed rents estimated by the households are detected by HBS
		CP043	Maintenance and repair of the dwelling	Major maintenance of the dwelling excluded from NA	Major maintenance of the dwelling included in the HBS
		CP044	Water supply and miscellaneous services related to the dwelling		
		CP045	Electricity, gas and other fuels		
CP05	Goods and services for the dwelling				
CP06	Health				
CP07	**Transport**	CP071	Purchase of vehicles	Second-hand cars excludes exchanges of cars between households	Second-hand cars includes exchanges of cars between households
CP08	Communication				
CP09	**Goods and services for recreation and culture**	CP091	Audio-visual, photographic and information processing equipment		
		CP092	Other major durables for recreation and culture		
		CP093	Other recreational items and equipment, gardens and pets		
		CP094	Recreational and cultural services	Gambling included in NA net of winnings	Gambling included in HBS gross of winnings
		CP095	Newspapers, books and stationery		
		CP096	Package holidays		
CP10	Education				
CP11	**Restaurants and hotels**	CP111	Catering services	Income in kind included in NA	Income in kind not detected by the HBS
		CP112	Accommodation services	Income in kind included in NA	Income in kind not detected by the HBS
CP12	**Miscellaneous goods and services**	CP121	Personal care		
		CP122	Prostitution	Included in NA	Not detected by the HBS
		CP123	Personal effects n.e.c.		
		CP124	Social protection		
		CP125	Insurance	Supplementary insurance premiums included in NA Only insurance services	Supplementary insurance premiums not detected by the HBS Expenditures on insurance are recorded gross of any reimbursements
		CP126	Financial services n.e.c.	FISIM Included in HFCE	FISIM Not detected by the HBS
		CP127	Other services n.e.c.		

Harmonising HBS and HFCE is a key step in allocating consumption expenditure among household groups taking into account differences in definitions and concepts but also in reference population.

2.1 The reference population

Following the EG DNA provided recommendations, first step is the correction for expenditures of non-resident households on the territory and of resident households abroad. The choice of 2019 as the reference year is related to the availability of the Tourism Satellite Account for that year and thus the possibility of using this data to adjust some consumption categories.

As mentioned above HFCE follows a domestic concept (expenditures of non-resident households on the territory are included while expenditures of resident households abroad are excluded) while the HBS follows a national concept (expenditures of non-resident households on the territory are excluded while expenditures of resident households abroad are included).

Moreover the population underlying HFCE differs from the population underlying the HBS: the survey covers the resident population with the exclusion of persons living permanently in institutions or without a registered place of residence while the reference population in HFCE is the present population on the national territory at a given date including households and persons living in institutions (convents, boarding schools, prisons, etc.). Reference population according to the HFCE concept is obtained by subtracting the number of residents temporarily abroad and adding foreigners present on the territory but not resident. As foreigners non-resident, tourists and present foreigners in Italy for one year or more (non-tourists) are taken into account. Non-resident foreigners include both foreigners with residence permit, but without a residence certificate, and unregistered foreigners without or expired residence permit. Stays in hotels and other accommodation structures for tourists collected by statistics on tourism are used to estimate the non-resident population on the Italian territory.

Table 2 shows the population underlying the HFCE.

Table 2 – *HFCE population, 2019 (thousands).*

	2019
Resident population (annual average)	59,729
Citizen temporarily resident abroad	-393
Non-resident foreigners present for at least one year	540
Foreign tourists	605
NA consumer population	**60,480**

Once defined the NA reference population, the first attempt to reconcile NA HFCE with HBS is a proportional “removing” the consumption of the population not covered in the micro source using the ratio between the two reference populations (table 3).

Table 3 – *HBS/NA population, 2019 (thousands).*

Reference population	2019
HBS (a)	59,211
NA (b)	60,480
Coefficient (b/a)	1.021

In fact, due to the lack of detailed information on expenditures of non-resident households on the territory and those of resident households abroad for each Coicop items, implicit coefficient derived is used as a correction coefficient at an aggregated level to move NA figures from domestic to national concept. Of course this leads to "rough" adjustment, because consumption expenditure by non-residents on territory and resident abroad may vary significantly across consumption items.

Table 4 shows the coverage rate (micro aggregate as a percentage of NA total) for all consumption items: first column ("raw data") is the ratio between HBS and NA without any adjustment. The total coverage rate is 72.3 percent: some items are well covered, some others show a rate less than 50 percent and in the case of the CP04 division the micro item is higher than NA estimate.

Table 4 – *Coverage rates for consumption items, 2019.*

Coicop (2-digit)	Coverage rate		
	Raw data	Adjusted data	
		P_1*	P_2**
Food and non-alcoholic beverages	93.0	94.4	95.2
Alcoholic beverages, tobacco and narcotics	31.2	31.9	31.7
Clothing and footwear	54.3	55.5	55.7
Rents, fuels and maintenance of the dwelling	110.4	112.8	111.8
Goods and services for the dwelling	52.9	54.0	54.2
Health	95.5	97.6	97.9
Transport	65.3	66.7	66.7
Communication	78.6	80.3	80.5
Goods and services for recreation and culture	51.9	53.0	53.2
Education	50.2	51.3	51.4
Restaurants and hotels	35.5	36.3	38.4
Miscellaneous goods and services	50.8	51.9	52.0
Total	**72.3**	**73.8**	**74.0**

** Proportional adjustment by the ratio between the two reference populations*

*** Proportional adjustment by the ratio between the two reference populations and tourism satellite account (for specific items)*

The correction for expenditures of non-resident households on the territory and of resident households abroad was made applying the population ratio (shown in

Table 3) to all Coicop categories leading to a better alignment and a reduction of the micro-macro gap (Table 4).

To adjust certain specific consumption categories at the detailed level (according to the national concept), information from Tourism Satellite Account are taken into account. The categories involved are imputed rents (CP04), transport services (CP07), recreational and cultural services (CP09), and restaurants and hotels (CP11). These categories are adjusted using the satellite account information, while the remaining categories are adjusted based on the population ratio (this explains the differing coverage rates between columns P1 and P2, even for items not covered by the satellite account).

2.2 Definitions and concepts

After the population adjustment, it is necessary to align NA totals to differences in definitions and concepts. Differences in definitions and concepts can be grouped into two types: treatment of items considered in both domains and types of expenditure covered by the survey but not by the NA, or vice-versa.

Table 5 – *Coverage rates for consumption items, 2019.*

Coicop (2-digit)	Coverage rate		
	Raw data	Adjusted data	
		P_2^*	P_3^{**}
Food and non-alcoholic beverages	93.0	95.2	96.5
Alcoholic beverages, tobacco and narcotics	31.2	31.7	51.7
Clothing and footwear	54.3	55.7	55.7
Rents, fuels and maintenance of the dwelling	110.4	111.8	111.8
Goods and services for the dwelling	52.9	54.2	54.2
Health	95.5	97.9	97.9
Transport	65.3	66.7	66.7
Communication	78.6	80.5	80.5
Goods and services for recreation and culture	51.9	53.2	71.3
Education	50.2	51.4	51.4
Restaurants and hotels	35.5	38.4	40.5
Miscellaneous goods and services	50.8	52.0	50.6
Total	**72.3**	**74.0**	**77.7**

** Population adjustment*

*** Conceptual adjustment*

Table 5 presents a comparison between the HBS results and NA estimates. The comparison is made with not adjusted data (first column) and data after the related adjustments (second and third column). Adjustments made for population had already leading HBS/NA ratio from 72.3 to 74.0 for total consumption.

Conceptual adjustments consist in excluding from NA those items that are not detected by the survey (e.g. expenses related to illegal activities, FISIM, tips and income in kind) and also some items that, although considered household expenditure by the survey and by NA, are quantified in different ways (e.g. spending on gambling, insurance, etc.).

This second step further improves the coverage rate to 77.7 for total consumption, at a more disaggregated level of expenditure, the ratio varies greatly: from 40.5 for the expenditure on restaurants and hotels to 111.8 for the expenditure on housing.

It is worth emphasizing that although we have compared the data made homogeneous both for the underlying population and from a conceptual point of view, a rather high gap remains for some consumption divisions, such as clothing and footwear.

It is important to stress that the fit between NA and HBS depends not only on the conceptual differences listed above but also on the sources used in NA to estimate household consumption. Clothing and footwear division is a clear example of this, it has a very low fit even if it has no conceptual differences.

2.3 National accounts sources

NA are not intended to cover aspects of households' well-being and several sources are used to derive household consumption, including HBS; moreover balancing process of the National accounts may have relevant impact on consumption estimates.

Five main groups of sources and methods identified are the following: commodity flow method (CFM), Household Budget Survey (HBS), Multipurpose Survey (MS), other Istat surveys (OIS) and administrative and other sources (Admins). All sources contribute to define the household consumption estimations and refers to specific item. Table 6 shows the sources involved for each consumption item.

The use of surveys on the demand side and their integration with other sources of information ensure a good degree of coverage, since no source, taken individually, can be considered as appropriate for estimating the overall consumption by Coicop item.

Table 6 – *Sources in NA household consumption estimation, by Coicop*.

Division		Sources
CP01	Food and non-alcoholic beverages	HBS
CP02	Alcoholic beverages, tobacco and narcotics	CFM/HBS/Admins
CP03	Clothing and footwear	CFM
CP04	Rents, fuels and maintenance of the dwelling	HBS/Admins
CP05	Goods and services for the dwelling	HBS/CFM/Admins
CP06	Health	HBS/Admins
CP07	Transport	HBS/Admins
CP08	Communication	HBS/CFM/Admins
CP09	Goods and services for recreation and culture	CFM/Admins
CP010	Education	HBS/MS/Admins
CP011	Restaurants and hotels	HBS/MS/OIS
CP012	Miscellaneous goods and services	CFM/HBS/Admins

The comparison of independent sources allows to capture a part of non-observed economy, not reported in tax statements of companies, and also to integrate phenomena partially measurable on the basis of information collected from households. Information from HBS is examined and then integrated with other sources and used mainly to estimate spending on food, housing, health services (particularly on health outpatient services), communications and other services included in the Coicop division which refers to miscellaneous goods and services.

The balancing procedure is the last step and corrects the discrepancies between the aggregates of resources and uses according to the domestic concept.

3. Micro-macro gap

Once all possible adjustments have been made, remaining gaps have to be allocated. The EG DNA guidelines suggest four methods for the gap allocation in order to distribute the NA totals using micro data:

- *Method A (direct method)*: the distribution of the gap is made proportionally to the micro values of same indicator, i.e. applying the same adjustment coefficient (macro total/micro total) to all households (their totals match NA totals);

- *Method B (indirect method based on proxies)*: a missing or unreliable micro component is estimated by using the distribution of another consumption component as a proxy;

- *Method C (indirect method based on external data)*: a missing or unreliable micro component considered can be distributed according to exogenous data (e.g.

sociodemographic information) available at the level of the individual or of the household;

- *Method D (invariant method)*: the remaining components are distributed in proportion to the total of all the NA and the imputations are made in such a way that the inclusion or exclusion of the component does not affect the distributional results of the main indicators.

Only M1 and M3 methods were deemed suitable for consumption by Eurostat and applied in the centralised exercise. Each Coicop category requires a separate analysis to choose the most suitable method.

All the considerations made so far are summarized in table 7 which shows the coverage rate for each Coicop division, but also, in the following two columns, a qualitative assessment which depends respectively on the conceptual fit and the use of HBS as a source in NA.

Table 7 – *Assessment of "linkage" in Coicop divisions between NA and HBS.*

Division	HBS/NA (adjuested for population and conceptual differences)	Conceptual link	HBS use
CP01 Food and non-alcoholic beverages	96.5	high	high
CP02 Alcoholic beverages, tobacco and narcotics	51.7	low	medium
CP03 Clothing and footwear	55.7	high	low
CP04 Rents, fuels and maintenance of the dwelling	111.8	medium	medium
CP05 Goods and services for the dwelling	54.2	high	medium
CP06 Health	97.9	high	high
CP07 Transport	64.4	medium	medium
CP08 Communication	80.5	high	high
CP09 Goods and services for recreation and culture	71.3	medium	medium
CP010 Education	51.4	high	low
CP011 Restaurants and hotels	40.5	medium	low
CP012 Miscellaneous goods and services	50.6	low	low

The result of two last columns "shows" in which division we can assume that using HBS to obtain distributional estimates is a good approximation, i.e. food or communication, whereas miscellaneous good and services where the assessment is low-low, probably need to be investigated in depth.

Summing up where the conceptual link and HBS use are indicated as high, method A can be applied. Method M1 can be also applied to the items where only the conceptual link is high, even if the use of HBS is indicated as low or medium: micro data are in fact close in conceptual term to the adjusted totals of NA. The only two Coicop items with low conceptual link are CP02 and CP12, mainly due to illegal

activities and FISIM. Where the assessment is low both in conceptual link and HBS use probably need of another method for the gap allocation.

4. Final remarks and way forward

Reconciliation of micro and macro data is a key issue to define distributional accounts. HFCE need to be harmonised with HBS in order to use the distributional information provided by the survey in the framework of National accounts. The distance between HFCE and HBS is not only related to conceptual differences and reference population but the most part derives from the sources used in HFCE estimates: this makes reconciliation challenging.

The empirical approach required the investigation of all available sources to define and better understand the micro-macro gap and then try to allocate it as properly as possible (Coli, Tartamella, 2017). All adjustments discussed above try to lead a better alignment between HFCE and HBS, not only in terms of amounts but especially in terms of definitions and concepts: the more these two domains are close in definitions and concepts, more is reasonable using the available HBS distributional information in the National account framework (Zwijnenburg *et al.*, 2021).

The incoming step is to analyse the estimated household consumption expenditure by quintiles - according to the equivalised sum of the HBS variables related to monetary net income plus imputed rent - and by socio-demographic characteristics (Chancel *et al.*,2021) .

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