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# Comparing National Accounts Income Aggregates with Income Aggregates Based on LIS Micro-Data

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## **Introduction**

This document presents a simplified mapping of National Accounts transactions and LIS variables which could be used as such or further elaborated in order to compare the LIS estimates with NA estimates. As an example, the mapping has been used to compare aggregates for four countries using LIS data from around 2004. A more detailed discussion and extended mapping is presented in the appendix. The empirical comparison of national accounts aggregates with LIS-based micro-data estimates, which is updated as new datasets become available, can be found in the [data appendix, prepared by Miri Endeweld](#), that accompanies this paper on the LIS website.

The System of National Accounts 1993 (SNA 1993) is the framework which all countries should follow when they compile the accounts. Unfortunately, there still are a number of differences between the national implementations and the SNA, particularly when going to more detailed level in the sub-accounts. Therefore it is best to consider the LIS countries in three groups: Europe, United States, and the Others. The European countries follow the European System of Accounts (ESA95) which is the European implementation of the SNA. The ESA95 follows the SNA coding, and data are available both from Eurostat and OECD databases.

The National Accounts of the United States are called National Income and Production Accounts (NIPA). They are produced by the Bureau of Economic Analysis. The layout and the terminology of the US accounts are different from the ESA95 and SNA, but the required main transactions are usually found. The BEA transforms annually some of the NIPA tables to SNA basis for the OECD and to help international comparisons. These original tables are available from the BEA www-site, and the data are available also in the OECD database.

The other countries are best considered case-by-case, primarily on the basis of OECD data. For the non-OECD countries, such as Russia, the national source may be the only option.

The data sources considered here are limited to (free) online databases, since compiling data for a number of countries even for a limited number of transactions and years is quite laborious. The comparison is crude, and the necessary adjustments are difficult to conduct. For any serious investigation of the differences, it is advisable to contact the national experts and ask for detailed data. The margin of error may be quite wide, even after accounting for sampling error and main

conceptual adjustments.

The recommended order of preference of the data sources is the following:

- 1) OECD for all countries (OECD.STAT)
- 2) Eurostat for the European Countries (Eurostat database/data)
- 3) The Bureau of Economic Analysis for the United States (tables on personal incomes and outlays); National Statistical Institutes for the other countries

### ***Some basic issues with National Accounts data***

To collect data from National Accounts, one needs to define:

- a) Sector: S14 household sector or S14\_S15 households and non-profit organizations serving households. In practice, one should try collect NA data both for S14 and combined S14S15.
- b) Direction of flow: resources means received and uses means paid, e.g. mixed income received or taxes on income paid. Some transactions such as wages and salaries are received only by households, and data on both resources (received by households) and uses (paid to households) may be useful.
- c) Transactions. Their coding is based on SNA, and both Eurostat and OECD use the codes. If the first letter is D, then the transaction is a distributive transaction. For the comparisons, distributive transactions are mostly used. Every account ends in a balancing item, and the first letter is then B. Transactions in products are shown in production and generation of income accounts but they are not used in the comparison.

It is helpful but not absolutely necessary to be familiar with the sequence of accounts in the system of National Accounts. National Accounts are compiled in a series of accounts, each having certain transactions as resources and uses and ending up in a balancing item. The two accounts that are needed for disposable income comparisons are:

- the distribution of primary income account. The balancing item primary income is the macro equivalent of factor income in micro statistics (compensation of employees, mixed income, operating surplus, and property income)
- the secondary distribution of income account. Current transfers received and paid as well as the balancing item "net disposable income" are shown in this account

The tables in the online databases do not necessarily follow the logic or sequence of the SNA accounts. Some sub-accounts may be compiled on a national level but the data are not transmitted to international organizations.

### **Net and gross**

The "net" concept in micro surveys means net of taxes and social contributions, and it is not unusual to have both gross and net recorded income variables in household surveys. National Accounts record income components gross of taxes and social contributions, e.g. wages and salaries are recorded before taxes, and taxes are shown separately. If only net amounts are available in the LIS data, these need to be converted to gross amounts to make the comparison. In practice, appropriate average tax rates have to be used for each component.

In National Accounts, "net" means net of consumption of fixed capital (depreciation). Gross national income is gross of depreciation, and net national income is net of depreciation and so forth. Conceptually, micro statistics should deduct depreciation but if actually measured this may be very

different from the NA depreciation, for example when micro sources use tax accounting depreciation and NA depreciation is estimated with capital stock model using perpetual inventory method.

### ***A simplified mapping of NA transactions and LIS income variables***

Table 1 suggests a simplified mapping to be used in the comparison, based mainly on parsimony and data availability. A more detailed mapping is presented in the appendix together with the discussion of each main income component.

A very basic comparison can be done with only three components covering large share of disposable income: wages and salaries paid (D11), social benefits received (D62), and taxes on income and wealth paid (D5). Only three aggregate transactions must be collected from the National Accounts databases to make the comparison which could then be expanded on a country-by-country basis, at least if large differences are found in D62 social benefits received.

Things get much more complicated with self-employment and capital incomes. The suggestion here is to combine these two in the overall comparison into "other factor income", because of conceptual issues but even more importantly because of measurement issues.

**Table 1. Simplified account for LIS/NA comparison**

<b>Income component</b>	<b>NA code</b>	<b>LIS variables</b>
Wages and salaries	D11P	V1+V6
Other factor income (self-employment and capital income)	B3G+D4R-D44R-FISIM	V4+V5+V8
Social benefits other than social transfers in kind	D62R	SOCI+MEANSI+V32+V33
Taxes on income and wealth	D5P	V11+V12
Employees' social contributions paid	D6112+D61131	V7+V13
"Net disposable income", adjusted	Sum of the above	Sum of the above

### ***Comparisons for four countries***

This simplified account is next used to compare LIS data from the latest wave with National Accounts for four countries: Finland, Norway, United Kingdom, and the United States. <sup>1</sup>

#### **Finland**

Income component	National Accounts	LIS	Coverage (LIS/NA), %
Wages and salaries	58675	58327	99%
Other factor income	13007	12460	96%
Social benefits other than social	26462	24537	92%

<sup>1</sup> See the file LIS\_NA\_numbers.xls accompanying this file for additional comparisons.

transfers in kind			
Taxes on income and wealth	20926	20796	99%
Social contributions paid	4989	3737	75%
"Disposable income" (adjusted, sum of the above)	72229	70915	98%

National Accounts figures for S14 Households are available separately for nearly all sub-components for Finland, and were used in this comparison. This slightly improves the coverage. For taxes, the transaction D5 taxes on income and wealth was used to maintain comparability with the other countries. The transaction D5 Income taxes was available and would have been better for this comparison.

The coverage rates are very high. The simplified mapping was first designed and tested with the Finnish data, and this may contribute to the high coverage rates. The quality of the data is good as well because registers are used, and because in the re-weighting income totals are calibrated to known total amounts. As a consequence, sampling error does not explain the differences, i.e. the sample survey estimates are not random variables and there is no point in calculating interval estimates. Survey incomes are mostly based on registers, and in many cases the same administrative data sources are used in National Accounts. This implies that measurement errors in the survey have insignificant effect to the differences. The differences are to large extent due to different data sources and methodology (especially self-employment incomes), and population coverage (exclusion of institutionalized population from the survey, especially in transfers received).

## Norway

Income component	National Accounts	LIS	Coverage (LIS/NA), %
Wages and salaries	628179	615459	98%
Other factor income	218223	142579	65%
Social benefits other than social transfers in kind	279467	251059	90%
Taxes on income and wealth	192908	183531	95%
Social contributions paid	65529	67134	102%
"Disposable income" (adjusted, sum of the above)	867432	758431	87%

In the case of Norway, the coverage of wages and salaries, social benefits and taxes on income are around the same level as in Finland.

"Other factor income" has lower coverage but a small part of this may result from problems with the comparison, e.g. FISIM-correction of interest received (see appendix, section on self-employment and property income) could be conducted for Finland but not for Norway. Nevertheless, since Norway takes income variables from registers, the coverage of adjusted self-employment + capital income should be better and the discrepancy further investigated.

Social contributions paid by employees were not available (or the author could not find the figures) from the international databases for Norway. However, the figure was available for households and NPISHs under the transaction "Employees, social contributions" from National Accounts tables at the www-site of Statistics Norway. Generally, a good strategy is to first gather the OECD or

Eurostat data, and then search national databases for more details or missing components.

Looking at national data of social benefits, we find that the NA figure at the database of Statistics Norway (254 647) would be closer to LIS value (251 059) than the figure from the OECD database (279 467). To keep the comparison itself comparable, OECD figures were used in the table.

## United Kingdom

Income component	National Accounts	LIS	Coverage (LIS/NA), %
Wages and salaries	550583	506445	92%
Other factor income	124745	95394	76%
Social benefits other than social transfers in kind	202569	166809	82%
Taxes on income and wealth	147134	127815	87%
Social contributions paid	Missing	32526	
"Disposable income" (adjusted, sum of the above)	730763	640832	88%

In the United Kingdom, we find the level of coverage being somewhat lower than in Finland and Norway but still at a reasonable level given all the uncertainties and differences in data sources (registers in Finland and Norway, interviews in the UK) involved. The somewhat low coverage of social benefits (82 %) should be investigated further. In the LIS figures, occupational pensions (V32+V33) were included in social benefits. The share of these variables out of total transfers is higher in the UK than in the other countries. An alternative way to measure social benefits received would be to look at the uses side, i.e. social benefits paid by general government (transaction D62P paid by sector S13) which is significantly lower than D62R in the UK. The difference between D62R and D62P then should be recorded somewhere else. The likely candidate is "other factor income" (as private rather than social insurance) thus reducing the coverage of this component but leaving unchanged the overall coverage of the sum of all income components. There is extensive discussion on the treatment of insurance in ESA95 manual. As a rule, employment-related pensions should be treated as social insurance in the accounts. See also discussion in the Canberra Group manual on income statistics on the treatment of pensions.

Social contributions paid by employees could not be found and were excluded from the comparison.

## The United States

Income component	National Accounts	LIS	Coverage (LIS/NA), %
Wages and salaries	5385700	5270952	98%
Other factor income	2896200	680087	23%
Social benefits other than social transfers in kind	1396100	937119	67%
Taxes on income and wealth	1046300	1106186	106%
Social contributions paid	420500	407596	97%
"Disposable income" (adjusted,	8211200	5374376	65%

sum of the above)			
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In the United States, the coverage is much lower than in the other countries. The main reason is the importance of "other factor income" in National Accounts and low coverage of this component. Wages and salaries and taxes and employees' social contributions have high coverage rates. All macro figures are taken from the OECD database except social contributions paid by employees. These are calculated from the national figures of the Bureau of Economic Analysis (paid contributions for government social insurance minus received employer contributions for government social insurance).

A further investigation of "other factor income" and social benefits should be conducted on the basis of the NIPA tables on personal income and outlays published at the www-site of the BEA. These tables show that personal asset income received (interest and dividends) are about the same as property income received in OECD database, and are thus at far higher level in the National Accounts than in the LIS.

Regarding social benefits, the NIPA table 2.1 at the BEA www-sites give the following disaggregation of current transfers, summing up to OECD total shown in the table above:

**Table 2.1. Personal income and its disposition**

Government social benefits to persons	1396100
Old-age, survivors, disability, and health insurance benefits	788000
Government unemployment insurance benefits	36000
Veterans benefits	34500
Family assistance	18400
Other	519200

*Source: US Bureau of Economic Analysis: National Income and Production Accounts (NIPA)*

These figures could be used for a more detailed comparison with LIS current transfers. The transfer item "other" takes up 37 percent of total transfers, and the rest covers the benefits from social insurance funds. According to NIPA documentation, other social benefits include: *the "refundable" portion of the earned income credit; workers' compensation; veterans benefits; food stamps; supplemental security income and other public assistance programs, and many other programs. Government payments to nonprofit institutions serving households, except payments for work under research and development contracts, are also included; these institutions are included in the NIPA personal sector.* If these are not included in the LIS current transfers, they should be excluded from the comparison. This would drastically improve the coverage of LIS social benefits in the US data.

**APPENDIX: Income components**

This appendix goes through the main income components, provides a more detailed mapping of NA transactions and LIS variables, explains some of the choices made with the simplified mapping, and finally lists the sources of data used for National Account figures (status in October 2008).

**Primary income**

Table A1 shows the components of primary income which is the equivalent of factor income in micro sources. The relevant balancing items and distributive transactions of National Accounts are in the allocation of primary income account. An alternative account to mixed income and operating surplus, entrepreneurial income account, exists but usually data is not found from international

databases.

**Table A1 . A mapping of primary income and factor income**

<b>Allocation of primary income account</b>				
Transaction	SNA Code		LIS	Note
<b>RESOURCES</b>				
Operating surplus	B2N	Imputed rent for owner-occupied housing	V9	Excluded from the comparison
Mixed income	B3N		(V4+V5+V8S2)	Proxy for self-employment income; includes actual rental income from dwellings
Wages and salaries	D11R		V1+V6	
Property income received	D4R		(V8)	
Interest received	D41R		V8S1	FISIM correction needed; otherwise interest received may be over-estimated in NA
Dividends	DN21R			
Withdrawals from quasi-corporations	D422R		(V8S4)	
Property income attributed to insurance policy holders	D44R		(V8S3)	Excluded from the comparison
Rent received	D45R		(in V8S2)	Only land rents in NA
<b>USES</b>				
Property income paid	D4			
Interest paid	D41	Interest paid	V8X	Excluded from the comparison
Rent paid	D45	No	No	Excluded from the comparison
FISIM	DP119R			Correction to interest received
<b>Entrepreneurial income account</b>				
<b>RESOURCES</b>				
Entrepreneurial income	B4	Self-employment income	SELFI (V4+V5)	NA figures usually not available

### **Wages and salaries**

Wages and salaries in National Accounts are conceptually close to LIS variables V1+V6, i.e. wages and salaries plus in-kind earnings. There are differences but their magnitude compared to total amount of wages and salaries should be small in most cases.



In the harmonized sector account tables, only compensation of employees received by households may be shown, i.e. wages and salaries + employers' social contributions. Since only households receive wages and salaries, one should search for wages and salaries *paid* in the economy from production or generation income accounts, or from tables that show components of value added by industries. Wages and salaries received by households are not equal to wages and salaries paid because wages and salaries paid to and received from abroad. In most cases the difference is small, and because the data are easier to find, wages and salaries paid may be the recommended choice for LIS comparison.

In the tables, the first choice is OECD data on wages and salaries paid in the economy. This may be controlled for with Eurostat data on wages and salaries received and paid for the European countries. The numbers were taken from the following online databases:

#### *OECD*

OECD.STAT/National Accounts/Annual National Accounts/Detailed tables and simplified accounts/6 Value added and its components by activity

Transaction: D11AY: of which: gross wages and salaries

#### *Eurostat:*

Data – National Accounts (including GDP) – Annual National Accounts – National Accounts detailed breakdowns - National Accounts aggregates and employment by branch – by 6 branches – aggregates at current prices

Transaction: S1 D11P Wages and salaries paid

Data – National Accounts (including GDP) – Annual Sector Accounts – Non-Financial Annual Sector Accounts

Transaction:

+ S14 D11R Wages and salaries received or S14S15 D11R Wages and salaries received

### **Self-employment income and property income**

It is suggested that comparison of self-employment income should be combined with property income because of the conceptual and practical differences and to simplify the comparison. For self-employment income, the conceptually relevant account in NA would be the entrepreneurial income account. It cannot be used for two reasons: it is almost never available, and if it is available, operating surplus cannot be separated. Operating surplus of households is the conceptual equivalent of imputed rent in LIS.

Instead, one must use mixed income in the comparisons which represents the remuneration to labor portion of income of the self-employed. It is included in the allocation of primary income account. The main difference between mixed income and entrepreneurial income is interest paid. Entrepreneurial income is mixed income – interest paid on "producer" loans (including mortgages on "producer loans" because imputed rents are home production of services in NA). In the standard allocation of primary income account, property income received and property income paid are separately added to mixed income.

The comparison includes only property income received and therefore NA figures exclude interest repayments on all loans. It seems that interest paid has not been deducted from interest received in

LIS, except when interest repayments are deducted from self-employment income. Since interest paid on business loans is not deducted from NA amounts, the comparison becomes somewhat invalid. On the other hand, if all interest repayments were deducted, interest paid on mortgage would be deducted as well. It is the counterpart of imputed rent of owner-occupied dwellings. For households, this might create more incomparability to NA figures than not deducting interest paid on business loans, and therefore the choice here has been to ignore interest paid altogether.

The comparison including interest received is further complicated with the allocation of FISIM which stands for financial intermediate services indirectly measured. Regarding interest received, FISIM is the difference between interest charged by the financial institution and the pure reference interest. For reasons beyond household sector account, the margin that banks withhold from the households' savings is still counted as household income. Because it may be a sizable component, FISIM should be removed from the NA figures and actual interest received used in comparisons. In the tables, a FISIM correction component is derived for the European countries based on Eurostat's figures.

The simplified version proposes that comparison should be based on LIS self-employment income and property income V4+V5+V8 with National Accounts' mixed income + property income received - conceptual differences. The simple suggestion here is to remove only D44R property income attributed to insurance policy holders as a conceptual difference, and to make the FISIM correction if available.

#### *OECD*

OECD.STAT/National Accounts/Annual National Accounts/Detailed tables and simplified accounts/13  
Simplified non-financial accounts

#### *Eurostat*

Data – National Accounts (including GDP) – Annual Sector Accounts – Non-Financial Annual Sector Accounts

#### *Transactions:*

+ B3G Gross mixed income

+ D4R Property income received

- D44R Property income attributed to insurance policy holders

FISIM correction to interest received (if available):

- (D41 Interest – D41G Total interest before FISIM allocation)

## **Transfers received**

Current transfers received in National Accounts are included in the transactions "D6 Social contributions and benefits" and "D7 Other current transfers". These are resources in the secondary distribution of income account and the redistribution of income in kind account.

*Table A2. Secondary distribution of income: transfers received.*

<b>The secondary distribution of income account</b>				
<b>National Accounts</b>	Transaction code		LIS	Note
Social benefits other than social	D62R		SOCI (V16+V18+V18+V	Social insurance transfers, including

transfers in kind			19+V20+V21+V22	occupational pensions but excluding private transfers
Social security benefits in cash	D621		+V23+V24)	
Private funded social benefits	D622		+ occupational pensions	
Unfunded employee social benefits	D623		(V32+V33)	
Social assistance benefits in cash	D624		V25	Social assistance cash benefits
Non-life insurance claims	D72			Excluded from the comparison
Miscellaneous current transfers	D75		(V34+V35)	Excluded from the comparison
<b>Redistribution of income in kind account</b>				
Social transfers in kind	D63			
Social security benefits, reimbursements	D6311			
Social assistance benefits in kind	D6313		V26	Included in LIS social benefits

The transaction D6 has three sub-components: D61 Social contributions, D62 Social benefits other than social transfers in kind, and D63 Social transfers in kind. Only D62 is used in the comparison. Sub-component D61 are employers' social contributions which are not received by households as transfers (they are received as D12 Compensation of employees and paid as D6). Sub-component D63 is recorded in the redistribution of income in kind -account and is not included in B6 disposable income but in B7 adjusted disposable income.

Sub-component **D62 Social benefits other than social transfers in kind** is near equivalent of LIS current transfers received. For the comparison, one should resort to only D62 received as it is almost always available (for S14\_S15 but S15 should not receive D62). Sub-components of D62 may be available, for example for the US in the NIPA tables on personal income and its disposition, or as disaggregated into social insurance and social assistance. More detailed comparisons are best done on country-by-country basis, although for example LIS variable V25 Social assistance benefits could be compared to D624 Social assistance benefits in cash for a number of countries.

An alternative way is to find D62 Social benefits *paid* by general government (sector S13), and to record the difference between received social benefits and paid by general government in factor income as private insurance income. For some countries, the difference is sizable while for some it is negligible. The LIS transfers need to be adjusted accordingly. The choice here has been to include all social benefits received as NA transfers, and to include all pensions (including occupational pensions V32+V33) as LIS transfer income. Individual private pensions should be recorded in LIS variable V8S3 Private savings plans and thus be included in property income, although they may not have been distinguishable from private occupational pensions. There might then be bias in the treatment of social benefits which needs to be double-checked for each country.

LIS records social assistance benefits in kind to V26 and counts them to disposable income. These have been included in social benefits in the comparison, although in-kind social benefits are outside the scope of disposable income in National Accounts, they are included in adjusted disposable income which is the balancing item of the redistribution of income in-kind account.

The recommendation is to exclude **"D7 other current transfers"** from the comparison. In other

current transfers, D72 non-life insurance claims (accident insurance, including term life insurance) should be excluded because they are not income (or should not be income) in LIS and they net out from NA disposable income as well. There are two transactions in other current transfers which are not received by household sector: D73 Current transfers within general government and D74 Current international operation.

The transaction **D75 Miscellaneous current transfers** includes transfers from non-profit institutions, remittances received, lotteries and gambling etc. A part of this component is recorded in LIS variables V34+V35 which include inter-household transfers and transfers from charitable organizations. Inter-household transfers are within-sector transactions and therefore are not included in National Accounts except transfers to/from households abroad, such as remittances. Since alimonies/child support (V34) and regular transfers from relatives (V35S1) are inter-household transfers, the choice here is to excluded V34+V35 and NA transaction D75 entirely from the comparison.

#### *OECD*

OECD.STAT/National Accounts/Annual National Accounts/Detailed tables and simplified accounts/13 Simplified non-financial accounts

#### *Eurostat*

Data – National Accounts (including GDP) – Annual Sector Accounts – Non-Financial Annual Sector Accounts

Transactions:

D62R Social contributions other than social benefits in kind

### **Transfers paid.**

Transfers paid are recorded in the secondary distribution of income account and are divided into two main transactions: D5 Taxes and D6 Social contributions.

*Table A3. Secondary distribution of income: transfers paid*

<b>The secondary distribution of income account</b>			
<b>National Accounts</b>	NA transaction code	LIS	Note
<b>USES</b>			
Taxes on income	D51	V11	Income taxes
Other current taxes	D59	V12	Property/wealth taxes
Employees social contributions	D6112	V13	Mandatory employee contributions
Mandatory social contributions by self- and non-employed persons	D61131	V7	Mandatory social insurance contributions paid by the self-employed: social

		security, medical insurance, unemployment, etc.
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D51 Taxes on income is roughly equivalent to LIS variable V11. National Accounts figures include taxes on holding gains although holding gains (capital gains) are not included as income. In LIS, both capital gains and taxes on them are (or should be) excluded.

If D51 is not separately available, one may use D5 Current taxes on income and wealth and compare this with LIS variables V11+V12.

D6112 Employee contributions paid are usually only available together with D6111 Employers' social contributions, i.e. only the total of D61 social contributions paid is available, if at all. Because the same amount of employers' social contributions is both added and deducted from income, D6111 paid is equal to D12R Employers' social contributions received. Therefore D6112 Employee contributions paid may be estimated as the difference between the total D61 (including both employers' and employees' social contributions paid) and D12R (employers' social contributions received).

#### *OECD*

OECD.STAT/National Accounts/Annual National Accounts/Detailed tables and simplified accounts/13 Simplified non-financial accounts

#### *Eurostat*

Data – National Accounts (including GDP) – Annual Sector Accounts – Non-Financial Annual Sector Accounts