

How to achieve the final net income by components in the Spanish SILC survey

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ABSTRACT

The EU-SILC survey is a valuable database for studying income distribution.

At the beginning of the survey, in 2004, some countries, including Spain, were not ready to provide users with gross income broken down by components. The majority of the respondents gave us the net of tax withholding at source.

However a first approach regarding the net-to-gross conversion, was done for the current monthly wages in 2004. The results of this approach were satisfactory: for those interviewed giving gross and net figures, it was possible to compare real and imputed gross.

This model kept on being developed and in 2005 the net-to-gross conversion model extended the other income components, having the final gross income available. Therefore the database was ready to be used under a microsimulation model.

We are currently working on the next step: calculate the final net by components by means of the tax returns. For this aim the Spanish tax parameters information has been used. In particular the information related to the new tax reform in 2007.

The purpose of this paper is to show the achievements obtained when developing the model and its utility to make studies on income distribution and microsimulation.

Keywords: EU-SILC, net-to-gross, final net, tax withholding at source, tax returns, microsimulation.

[1] INTRODUCTION

One of the medium-term aims of the survey has been to provide gross income figures broken down into components. Although the questionnaires ask for both gross and net figures for all components in general, the respondents are often unaware of their gross income, so that a model to convert net figures to gross for the various components has been developed.

According to Annex II of the Commission Regulation on definitions, Eurostat allows Spain not to provide gross figures until the survey in 2007. However INE did an initial work to implement net-to-gross conversion for current monthly wages in 2004 survey. The methodology used was checked against a wide range of records, because a high percentage of respondents, 44%, (particularly high for current wages) provided with gross and net figures. The results were very satisfactory, as one can see from the tables below:

TABLE 1

Average gross earnings (GE) imputed by the model and reported by respondents, by fiscal region

		Mean (euros)	Number of records	% difference from the mean
Basque Country	Imputed GE	20,028	129	
	Reported GE	20,068	129	0.2%
Navarre	Imputed GE	19,903	146	
	Reported GE	19,835	146	0.3%
Rest of Spain	Imputed GE	16,545	4.304	
	Reported GE	17,297	4.304	4.5%
Total	Imputed GE	16,750	4.579	
	Reported GE	17,456	4.579	4.2%

TABLE 2

Average gross earnings (GE) imputed by the model and reported by respondents, by social contribution scheme

		Mean (euros)	Number of records	% difference from the mean
General scheme, group 1	Imputed GE	33,463	294	
	Reported GE	35,643	294	6.5%
General scheme, group 2	Imputed GE	21,387	142	
	Reported GE	22,142	142	3.5%
General scheme, group 3	Imputed GE	19,747	71	
	Reported GE	20,321	71	2.9%
General scheme, group 4	Imputed GE	17,973	39	

	Reported GE	19,632	39	9.2%
General scheme, group 5	Imputed GE	14,177	3,076	
	Reported GE	14,797	3,076	4.4%
Agricultural worker scheme	Imputed GE	10,778	105	
	Reported GE	10,752	105	0.2%
Domestic employee scheme	Imputed GE	6,063	87	
	Reported GE	6,101	87	0.6%
Public sector: secondary school teacher	Imputed GE	24,687	162	
	Reported GE	25,232	162	2.2%
Public sector: primary school teacher (group B)	Imputed GE	22,100	155	
	Reported GE	22,675	155	2.6%
Armed forces	Imputed GE	19,304	27	
	Reported GE	20,161	27	4.4%
Civil servants: group A	Imputed GE	33,244	46	
	Reported GE	34,025	46	2.3%
Civil servants: group B	Imputed GE	23,600	42	
	Reported GE	24,369	42	3.3%
Civil servants: group C	Imputed GE	20,686	97	
	Reported GE	22,241	97	7.5%
Civil servants: group D	Imputed GE	17,054	167	
	Reported GE	17,644	167	3.5%
Civil servants: group E	Imputed GE	16,380	69	
	Reported GE	15,707	69	4.1%
Total	Imputed GE	16,750	4,579	
	Reported GE	17,456	4,579	4.2%

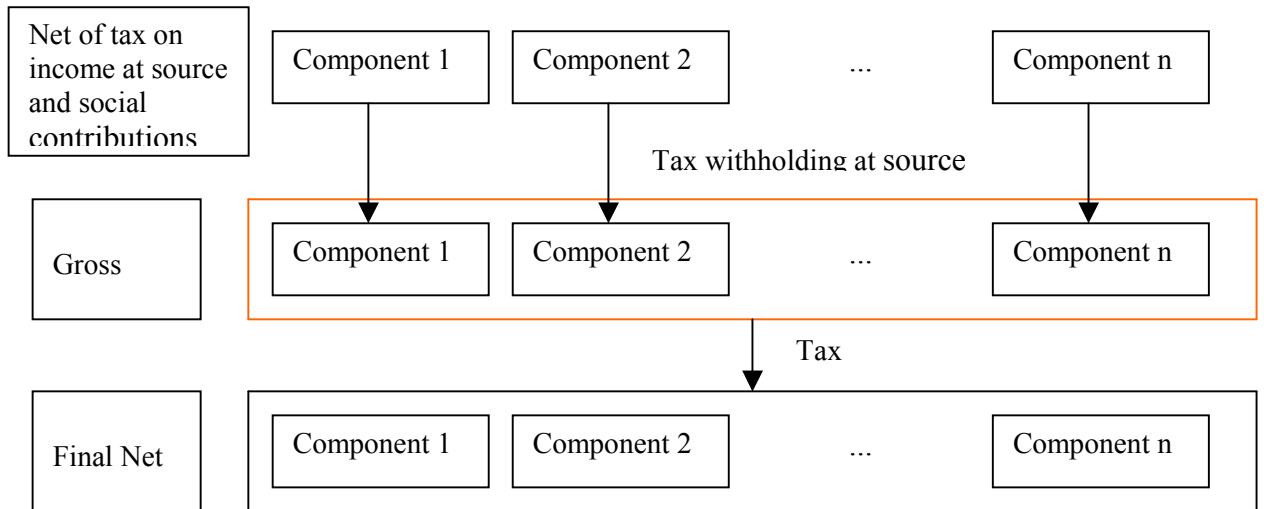
Eurostat has drawn up several methodological reports that aim to achieve this goal in a general way, and can be applied to any fiscal system.

In Spain, two systems of tax computation are applied in parallel: a system of tax withholding at source and a system based on tax returns.

The first one is solved applying the model that converts net to gross, whereas another model is needed in order to calculate the final tax liability.

This way, these two models combined will provide us with final net.

The scheme:



[2] HOW DOES THE NET-TO-GROSS MODEL WORK?

The characteristic feature of the Spanish system is that two systems of tax computation are applied in parallel:

- A system of tax withholding at source
- A system based on tax returns giving the 'final' liability

A large part of tax payers may fulfil their tax obligations through the payment of withholdings. Later the system aims to adjust it to the right amount of their liability under the tax-return system. This way, the number of tax payers who need to make a tax return can be significantly reduced.

Those persons, who have received income during the reference year, with a total income above a certain level, are subject to tax withholding at source. A subset of these is not required to make a tax return. It means that people below that limit do not have to present the tax return, limiting their tax burden exclusively to the monthly withholding. Nevertheless, these persons may have their tax liability adjusted according to a tax return they make, if that is convenient or advantageous to them to do so.

a) Tax withholding at source

Depending on the family situation (number of children, marital status etc), persons with income below a certain limit are not subject to tax withholding at source. The basic unit of assessment is the individual. The rate of withholding at source is determined taking into account the kind of income component:

- Regular income from employment, unemployment benefits, old age and survivors' benefits, family related benefits, sickness and invalidity benefits and other personal taxable benefit are treated in the same way.
- Other taxable components, such as income from self-employment, financial capital or certain types of rental income, are subject to withholding tax at flat rates.
- Benefits such as those relating to education, housing and social assistance, as well as private transfers received, are tax-exempt.

The Spanish model calculates the **tax retention binding** with the marital status, number of children, dependant couple and gross income; the **reduction** with the

gross taxable income, i.e, gross income less social insurance deductions; the **personal and familiar minimum** with the taxpayer's age, number of children under 25 with annual incomes under a certain quantity, number of children aged in (0,2), number of ancestors aged in (65,75] with annual incomes under a certain quantity, number of ancestors over 75 with annual incomes under a certain quantity, and a variable that shows if the taxpayer shares expenses or not; and then the **final tax retention** with the taxpayer province, net taxable income, tax retention binding, number of children under 30 with annual incomes under a certain quantity and gross income.

Returns: the final tax retention.

b) Tax returns

An individual is not obliged to fill an income tax return if total gross income is below a certain limit irrespective of the income sources. Otherwise, the person is obliged to make a tax return if:

- The total income from employment, from capital, and from unemployment, pensions, family-related, sickness and invalidity and other taxable personal benefits, exceeds a certain limit or
- Capital and rental income exceeds a certain limit or
- If any income is received from self-employment

In the tax return, all taxable income from whatever source is pooled together to determine, after appropriate deductions, the tax base for the computation of tax liability on the basis of a standard tax schedule. The final tax liability takes into account certain tax credits to which the person may be entitled.

The schedule of deductions, tax rates and tax credits depends on, among other characteristics, the tax unit chosen for the assessment. Essentially, the Spanish Personal Income Tax system is based on the individual as the tax unit. However, if the individual is part of a family unit, then the system allows them to pay under a joint scheme with the other members of the family unit. A family unit can be formed either by married couples, whether or not sharing the dwelling with children aged under 18, or lone parents living with children under 18. Persons in a fiscal 'family unit' may choose to make a joint return or an individual return; the others can only make an individual return.

The two systems have a similar structure, and in fact aim to replicate each other in the final outcome.

The main differences are the following.

- The withholding system takes individual tax payer as the unit; the tax return may be on an individual or, where applicable, a joint basis.
- The common income base in the tax-return system is the total taxable income of the individual, or where applicable, of the joint unit. For the withholding system, there are different base of contribution for each kind of income. Income from self-employment, capital and certain other sources is taxed at flat rates.
- The tax-return system allows for certain tax credits (tax refunds); these do not apply in the tax-at-source regime.

The social insurance and tax deduction schemes are the same or very similar in the two systems, apart from the effect of the choice of tax unit (individual versus joint) in the tax return system.

c) Social insurance contributions

The Social Security System is a set of Regimes through which the State guarantees the persons included in their field of application, due to the fact they carry out a professional activity or fulfil the requirements demanded in the non-contributive modality, as well as the family members or assimilated persons they have in their charge, suitable protection in the contingencies and situations defined by the law.

Each worker is classified in a particular Regime. The final amount is the result of applying the type of contribution to the base of contribution.

The Contribution Base for the different schemes of the Social Security System will be the amount that results from applying the rules which are established for the different schemes in the General State Budget Act for each tax year, in the General Rules on Contribution and Assessment of other Social Security payments and in the rules that apply to or supplement the latter.

The maximum limit will be the same for all the activities, occupational categories and eventualities covered by the scheme in question and will apply independent of

the number of hours worked, even in the case of multi-employment, but not in the case of multi-activities.

The minimum limit of the contribution base will be the whole amount of the prevailing minimum guaranteed wage the time, increased by one sixth, except when there is a provision to the contrary.

The limits relating to the contribution bases are made up of the minimum and maximum amounts or single amounts for each group of professional classifications or activities and are set in the corresponding Law on the General State Budget for each financial year and in the Annual Contribution Order.

The contribution type is the percentage applied to the contribution base, the result of which is the payment or amount to be paid.

The types of contribution will be those established each year in the corresponding General State Budget Act.

Social insurance contributions are paid by workers on regular income from employment and income from self-employment. Employees' income (gross of income tax and contributions paid by the employee) is also subject to social insurance contributions from the employer.

Apart from the level of income, the amount paid depends on status in employment, industry, occupation and other characteristics of the worker. Details are given below for the following major categories.

Employment income includes workers under the 'general regime', civil servants, workers in the agriculture sector, apprentices and workers' contributions for unemployment insurance.

Self-employment income includes self-employed in non-agriculture sectors and self-employed in the agriculture sector.

The **Social Insurance's General Regime** is the most widely applicable regime, and covers all workers outside the agricultural sector, civil service or apprenticeship. Workers' general regime is divided into seven different groups of contribution, according to the type of occupation. Each group's base has a minimum and a

maximum limit, as explained above. The contribution rate for employers and for employees is the same for all groups.

Apprentices pay social insurance contribution at a different (lower) rate compared to ordinary workers.

The receivers of unemployment insurance pay this contribution. The contribution base is the individual's previous earnings, which are the earnings the individual gained before getting unemployed. The rate of contribution is flat.

Civil servants are workers in public institutions with a long-term contract, who have won a state competitive contest. Not all persons working in the civil service, even those with a long-term or permanent contract, are considered 'civil servants'. Civil servants are distinguished from other categories of workers in the civil service such as: 'laborales' (workers in public institutions with a long term contract, but who got the job without state competitive contest), workers on temporary contract, and apprentices.

The Agriculture Sector Regime is divided in seven different groups of contribution, according to the type of occupation. For each group the base is fixed. The contribution rate for employers and for employees is the same for all groups.

The **social insurance contribution for self-employed** workers has some degree of flexibility. The worker can opt between two different rates of contribution (including or not including temporary sickness or invalidity benefits). The base of contribution is also flexible. The worker can choose its amount between a minimum and a maximum limit.

The agricultural self-employed social insurance contribution, in practice, works as a lump-sum contribution, since the rate is flat and the base is fixed.

To calculate the social insurance contribution, the Spanish model uses the variables gross income, employment, activity and education level.

The gross income, unknown, is assumed to be 1,20% times the given net at the first step of the algorithm. This value changes as the algorithm goes on.

[3] CALCULATION OF FINAL NET BY COMPONENTS

An individual is not obliged to fill an income tax return if total gross income is below a certain limit. In the tax return, all taxable income from whatever source is pooled together to determine – after appropriate deductions - the tax base for the computation of tax liability on the basis of a standard tax schedule. The final tax liability takes into account certain tax credits to which the person may be entitled.

In the Spanish model we are considering to add up the tax credits related to own-house investments, but only for those who purchased the dwelling before 2007 (when the reform was enforced)

The schedule of deductions, tax rates and tax credits depends on, among other characteristics, the tax unit chosen for the assessment. Essentially, the Spanish Personal Income Tax system is based on the individual as the tax unit. However, if the individual is part of a family unit, then the system allows him/her to pay under a joint scheme with the other members of the family unit. Persons in a fiscal 'family unit' may choose to make a joint return or an individual return; the others can only make an individual return.

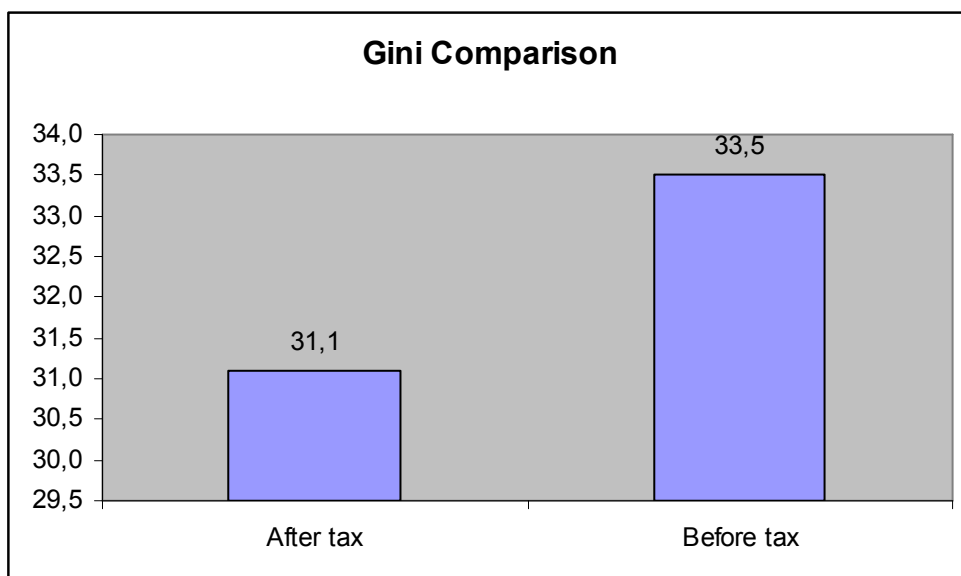
In the Spanish model we have developed so far the tax system based on the individual as the tax unit. However we are planning to study the tax system on a joint-basis and decide the arrangement least disadvantageous to them.

Persons who are not obliged to make a tax return may nevertheless choose to do so, and hence have their final tax liability adjusted to that return. Hence for taxpayers who are obliged to make a tax return, and for those not obliged but who choose to make a tax return, this system gives the 'final' tax liability.

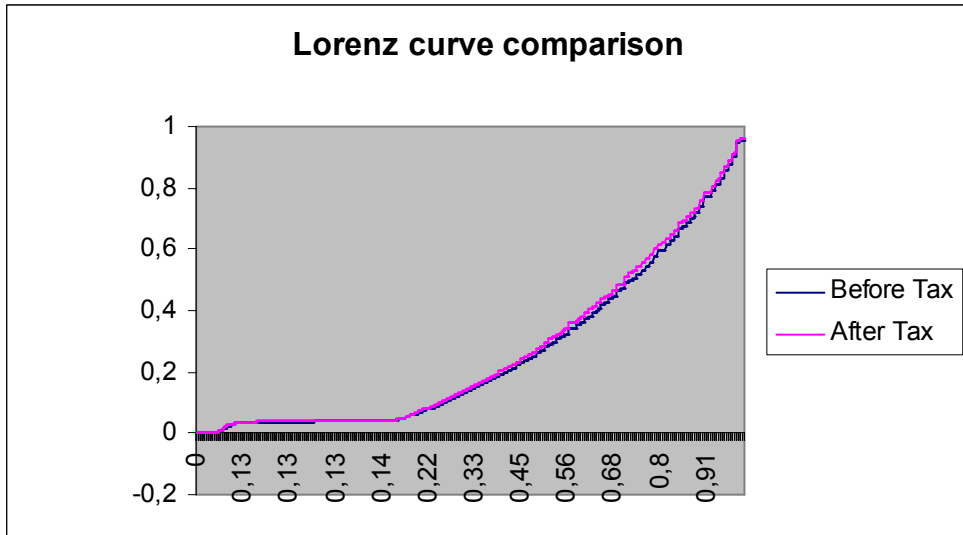
[4] BENEFITS OF KNOWING GROSS AND DISPOSABLE INCOME

The fact of knowing all the taxation on households and individuals lets us compare how fair a tax system is in terms of redistribution.

Here we present the Gini Index, before and after taxes, and we can see that the individuals inequality has decreased when the taxes have been applied, obtaining a reduction of 7.5%



If we plot the Lorenz curve we come to the same conclusions, since the curve after taxes is over the before tax curve.



[5] DATABASE USED IN OUR PROJECT

There are certain variables that we provide to Eurostat in the H-file which are obtained in our individual questionnaire. So that we have information for every single member in the household for that component.

For instance, the variable **HY050** which relates to family and children allowances is split into several categories in the individual questionnaire. We ask for:

- **Parental leave benefit:** benefit paid to either mother or father in the event of interruption of work or reduction of working time in order to bring up a child, normally of a young age.
- **Family or child allowance:** periodical payments to a member of a household with dependent children to help with the costs of raising children in cases such as, birth of third child, birth of twins, etc.
- **Risk during the pregnancy benefit:** other than parental leave benefit
- **Monthly 100 €:** for those women with children aged 0-3 and jobs other than those related to household tasks, and contributing to the Social Security system in, at least, the 100 € benefit.
- **Other benefits** such as kindergarten and children's tuition.

We don't treat them the same way when calculating the net-to-gross conversion; therefore the deeper knowledge on the variable the more accurate the model is.

[6] COHERENCE WITH OTHER SOURCES

A microsimulation model calculates the amount of money collected by the Tax Authorities, and we can have that data using the Spanish database.

Comparison with external sources is difficult because the definitions used do not match. The difficulty stems from the definition of the income component itself, which affects comparison of the number of people receiving a given income component, and from the way an amount is expressed (external sources usually state gross figures), which affects comparison of average amounts.

A very large proportion of social transfers depends on Autonomous Communities (self-ruling region), and so it is very hard to bring all the available information together.

Nevertheless, we provide a range of tables to offer a guide to the structure of income distribution using other sources.

The available results from external sources come from INE National Accounts Starting with the Survey on Income and Living Conditions (SILC) results, the following table itemises number of recipients, average income, average monthly income (taking account of 14 annual pay packets) and total income by component.

Source: Spanish Living Conditions Survey (ECV). Adult recipients by income type (net figures)

	Recipients (thousands)	Average income 2005 (euros)	Average monthly income 2005 (euros)	Total income 2005 (millions of euros)
Cash employee income	17.668	13.698	978	242.012
Non-cash employee income	309	3.481	249	1.074
Cash profits or losses from self-employment	2.755	11.329	809	31.206
Unemployment benefits	1.819	3.541	253	6.442
Old-age benefits	5.457	9.986	713	54.496
Survivors benefits	1.675	6.440	460	10.786
Disability benefits	793	7.291	521	5.780

Source: Spanish Living Conditions Survey (ECV). Adult recipients by income type (gross figures)

	Recipients (thousands)	Average income 2005 (euros)	Average monthly income 2005 (euros)	Total income 2005 (millions of euros)
Cash employee income	17.668	16.659	1.190	294.321
Non-cash employee income	309	3.481	249	1.074
Cash profits or losses from self-employment	2.755	14.159	1.011	39.000
Unemployment benefits	1.819	3.610	258	6.568
Old-age benefits	5.457	10.291	735	56.160

Survivors benefits	1.675	6.525	466	10.929
Disability benefits	793	7.361	526	5.836

The components having higher tax rates are those related to employment, whereas the benefits rates are lower.

Source: Spanish Living Conditions Survey (ECV). Recipient households by income type (net figures)

	Recipient households (thousands)	Average income 2005 (euros)	Total income 2005 (millions of euros)
Income from rental of a property or land	782	5.140	4.020
Interest, div., profit from capital invest.	3.983	655	2.608

Source: Spanish Living Conditions Survey (ECV). Recipient households by income type (gross figures)

	Recipient households (thousands)	Average income 2005 (euros)	Total income 2005 (millions of euros)
Income from rental of a property or land	782	5.663	4.429
Interest, div., profit from capital invest.	3.983	751	2.992

Comparing the results obtained from SILC survey to National Accounts, one can see that the amounts are pretty similar: 294.321 (year 2005) on cash employee income for SILC and 288.640 (year 2003) for NA.

Having final gross and net we know the taxes and Social Security contributions collected and, since the Spanish Model is prepared to be easily modified if the fiscal rules vary, different scenarios could be simulated depending on the analyst assumptions.

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