



STATISTICS DIRECTORATE

National Accounts and Financial Statistics Division

Satellite Account for Education for Portugal: Implementation process and links with the National Accounts and Questionnaire UOE

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Satellite Account for Education for Portugal: Implementation process and links with the National Accounts and Questionnaire UOE

1. Introduction

The Satellite Account for Education (SAE) is in a process of implementation in Portugal as a pilot project where its feasibility is analysed. Its implementation resulted from domestic demands on one hand and from the need for economic data on education at international level (questionnaire UOE) on the other.

The main purposes for compiling the pilot project of SAE are:

- to provide an important analytical for supporting the analysis, decision and policy-making in the education sector;
- to meet the requirements of the questionnaire UOE on Education expenditure

A final purpose would be to have better quality data on education for the National Accounts not only in the estimation of education but also to evolve on volume measures.

The pilot project is being carried out on a bottom-up approach for the reference year 2005 and its implementation is planned until the end of 2007.

An operational group involving experts from the National Statistical Institute, the Ministry of Education and the Ministry of Science and Post-secondary Studies was set up to implement on a first stage a pilot project on SAE and if successful to guarantee its continuity. This operational group is formalized through a protocol of cooperation between all the involved bodies in order take the best out of the statistical information on the broader area of education that the three parties have to offer.

The general conceptual framework proposed intends to meet the need for information intended to measure:

- how much is spent on education by producers and in which type of specific products of education;
- who are the financers of education both in terms of who finances the producers of education and which products are financed;
- Measurement of productivities in the education industries through the calculation of Gross Value Added in order to understand if the expenditure is changing due to volume changes.

Until this moment there is no conceptual framework officially and internationally defined for the SAE. This is a problem in the extent that the designing of a framework for one country may not necessarily be appropriate for other countries. On the other hand the advantage is the existence of some flexibility to reflect the national reality.

Moreover the SAE must be in line with the SNA93/ESA95 as a satellite account. This means that the national accounts framework is a good tool to be used in the SAE although some specificities and changes exist appropriate to the specificity of the sector that is under study. In addition the health accounts provide also a good guidance in terms of financers and creation of specific even more detailed products (which exist in the ISCED classification) that are not covered by CPC/CPA.

On the other hand the questionnaire UOE also supplies guidance in terms of data requirements of variables and classifications at the level of education services by level of education. The designing of the framework also took into account the data needs for the questionnaire UOE. However the framework proposed enlarged the scope of education of the questionnaire. This is because the working group considered that the questionnaire has some restrictions regarding the measurement of education, in the way that doesn't provide any data on output providers and the financing agents are too restrict.

The measurement of Education can be made into 3 dimensions: producers of education, products of education and financers of education.

2. General description of the adopted framework

a. Classifications of producers/providers, products and financers adopted

As previously mentioned in order to implement the SAE it was necessary to establish a list of classifications that fulfilled the needs of SAE framework. The classifications proposed respect the concept of education. The only existing classifications at an international level are the ISCED (classification of education) and the ISIC/NACE and CPC/CPA.

Therefore the first task was to create a classification of products that would respect the ISCED but was enlarged in order to cover additional products that are not included directly in the questionnaire. In all cases there is a direct correspondence between the proposed classification of products in education and the ISCED. Also for the aggregation there is a direct correspondence between the classification of products and the classification of products used in the Portuguese National Accounts, which by its turn is according to CPA. The detail of the classification of products in education is respects the need of the Portuguese Education System.

The classification of producers took into account the production of products in education and tries to cover all the producers of education. There is a direct correspondence between the classification of producers and the NACE with the appropriate specificities adopted in the SAE in relation to education.

On the other hand the need to know who the financers of education are led to the creation of a classification of financers that is fully in accordance with the institutional sector classification in the National Accounts.

Therefore the classifications proposed and adopted for the SAE:

- Classification of Providers of Education (**EP**);
- Classification of Products in Education (**EC**);
- Classification of Financing Agents on Education (**EF**).

Classification of of producers/providers of Education

National classification for the portuguese staellite Account for education

Producers _ Providers of Education (EP)

| Code | Designation | NACE |
|----------|--|-------------|
| 1 | Establishments of education | |
| 1.1 | Establishments of pre-school education (includes kindergardens) | 80101 |
| 1.2 | Establishments of basic education | |
| 1.2.1 | 1º stage | 80102 |
| 1.2.2 | 2º stage | 80211p |
| 1.2.3 | 3º stage | 80211p |
| 1.3 | Establishments for secondary education | |
| 1.3.1 | Establishments for secondary general education (regular and recurrent) | 80212 |
| 1.3.2 | Establishments for secondary education- technical and professional/qualifying | 80220 |
| 1.4 | Establishments for superior studies | 80300 |
| 1.4.1 | Establishments for superior studies - Universities | |
| 1.4.2 | Establishments for superior studies - politechnicians | |
| 2 | Establishments for professional schools not defined by levels | 8042 |
| 3 | Ancillary producers | |
| 3.1 | Publishing and Edition | 2211 |
| 3.2 | Retailers (bookshops) | 52471 |
| 3.3 | Producers of school materials | 21;22 |
| 3.4 | Retailers of school materials | 52472;52481 |
| 3.5 | Producers of hardware and software(computers, calculators, etc) | 30 |
| 3.6 | Retailers of hardware and software(computers, calculators, etc) | 52481 |
| 4 | Establishments of ancillary services | |
| 4.1 | Providers of ancillary pedagogic services (ex. private tuition providers) | 80422 |
| 4.2 | Providers os social services on education | 85321 |
| 4.3 | Providers of school transport | 6022;6023 |
| 4.4 | Providers of canteens or catering services provided to schools | 5551 |
| 5 | Providers of research and development | 73 |
| 5.1 | Providers of Education | |
| 5.2 | Other units | |
| 6 | Administration of Education | 75 |
| 6.1 | Ministry of Education, Regional Bureaus of Education of Madeira and Azores | 75 |
| 6.2 | Ministry of Science and Superior Studies, Regional Bureaus of Madeira and Azores and autonomous bodies | 75 |
| 6.3 | Others | 75 |

Nota: The providers of education in the Satellite Account for Education are allocated in each category according to the respective main activity in that category, that is, more than 50%. For instance, a provider of education is allocated into category 1.2.2 if its main activity is the second stage of basic education. For that purpose for each provider the proportion o the number of students in each category should be considered. If one provider provides more than one category (ex. 2º and 3º stage) its classification should be made according to the level of education in which the number of students represents more than 50%. This procedure should be used for the categories 1 and 2. For the remaining categories the allocation of a producer to the respective industry is made according to the proportion of the Gross Value Added.

| |
|---|
| Classification of Products in Education (EC) |
|---|

| ISCED | Code | Designation | CPA |
|-------|----------|---|----------------------|
| | 1 | Basic Education | |
| 1 | 1.1 | Basic education - 1º stage | 801012 |
| 1 | 1.2 | Basic education - 2º stage | 802111p |
| 2 | 1.3 | Basic education - 3º stage | 802111p |
| | 1.4 | Education specialized in arts | |
| | 1.5 | Professional/qualifying education | |
| 3 | 2 | Secondary Education | 802112;802211;802212 |
| | 2.1 | Regular | |
| | 2.1.1 | General/Scientific-Human Sciences | |
| | 2.1.2 | Technological | |
| | 2.2 | Recurrent | |
| | 2.2.1 | General/Scientific-Human Sciences | |
| | 2.2.2 | Technological | |
| 4 | 3 | Post-secondary Education | 803011 |
| | 4 | Superior Education | |
| 5B | 4.1 | Superior Education-Bachelor | 803012 |
| 5A | 4.2 | Superior Education-License degree | 803012 |
| 6B | 4.3 | Superior Education-Master degree | 803012 |
| 6A | 4.4 | Superior Education-Doctorship | 803012 |
| * | 5 | Education not defined by levels | |
| * | 5.1 | Professional training | 804210 |
| * | 5.2 | General pedagogic support | 804220 |
| * | 5.3 | Specific pedagogic support | 804220 |
| * | 5.4 | Others (ex. babysitting, kindergardens and care of children out of school time) | |
| * | 6 | Research and Development | 73 |
| * | 7 | Ancillary products | |
| * | 7.1 | Books | 2211 |
| * | 7.2 | School materials(notebooks, pens, paper, calculators...) | 212 |
| * | 7.3 | Computer material | 3002 |
| * | 7.4 | Expenditure in internet, software and ancillary products used in computers | |
| * | 8 | Ancillary services | |
| * | 8.1 | Services of accomodation for students | 5523 |
| * | 8.2 | Services of canteens or meals in general for students | 5551 |
| * | 8.3 | Health services in education providers | 85 |
| * | 8.4 | services of transport | 6022;6023 |
| * | 9 | Administration of Education | 75 |

* national classification created for the Satellite Accounts for Education in Portugal

National classification created for the Satellite Accounts for Education in Portugal

Financing agents on Education (EF)

| Code | Designation | Institutional sector of the National Accounts |
|------------|--|---|
| 1 | Public Financing | |
| 1.1 | General Government | S13 |
| 1.1.1 | Ministry of Education, Regional Bureaus of Education of Madeira and Azores | S13 |
| 1.1.1.1 | Mainland | S13 |
| 1.1.1.2 | Autonomous Regions of Azores and Madeira | S13 |
| 1.1.2 | Ministry of Science and Superior Studies, Regional Bureaus of Madeira and Azores | S13 |
| 1.1.2.1 | Mainland | S13 |
| 1.1.2.2 | Autonomous Regions of Azores and Madeira | S13 |
| 1.1.3 | Autonomous bodies and others | S13 |
| 1.2 | Public quasi-corporations | S11 |
| 2 | Private financing | |
| 2.1 | Private corporations | S11 + S12 + S14 |
| 2.2 | Households | S14 |
| 2.3 | Non-Profit Institutions Serving Households (NPISH) | S15 |

Notas: The concept "Financing Agent" covers the financing of the units described in this classification whether in the role of financing the production out of their own-funds or in the role of financing the acquisition of goods and services of education provided to the households. For instance, the Ministry of Education and the Ministry of Science and Superior Studies finance the provision of education and finance the households through social work (granting of social transfers in cash or in kind), intended for the consumption of education (whether provided by the public or private sector). As an example, the tax credit due to expenditures on education by households are considered as being financed by the Ministry of finance. The households are financers of their own actual expenditure on education after deduction of the expenditure financed by other financing agents.

Institutional sector of the National Accounts (grouped according to its function and economic behaviour)

| | |
|-----|--|
| S11 | Non-Financial corporations Sector |
| S12 | Financial corporations Sector |
| S13 | General Government |
| S14 | Households, including self-employed |
| S15 | Non-Profit Institutions Serving Households (NPISH) |

b. Adopted framework

The Satellite Account for Education (SAE) aims to measure the economic flows of education carried out by producers for the production of education products and its relations between financers. Education covers all the education products that are specific of education plus those that directly connected to education in the way that are ancillary to education. The SAE should be complete, exhaustive and reliable.

The framework adopted is fully in line with the SNA93 in terms of methodology and concepts. Conceptually the main specific characteristic of the SAE in relation to the core accounts of the national accounts is the classification of the output and expenditure in professional training made by enterprises on behalf of their employees, which is considered as output used for final consumption.

Another issue that is still open relates to classification of the output and uses of Research & Development. The questionnaire UOE considers only the R&D carried out by the establishments of Education. The operational group thinks that all R&D should be considered in the SAE. One of the reasons lies in the fact that there are many enterprises that produce R&D subcontracted by universities. In addition all R&D somehow is integrated in the education programmes and therefore induces better education. Even the R&D produced by enterprises for their own use is converted in professional training.

The adopted framework proposes the compilation of the following tables:

- Table A- Education Supply and Uses table type
- Table B- Employment in the Education Sector

- Table C- Total expenditure in Education (producers of Education X Products in Education)
- Table D- Current expenditure in Education (Financing Agents X producers of Education) + Capital transfers by financing Agents
- Table E- Current expenditure in Education (Financing Agents X Products in Education)

Table A.1 – Education Supply Table type (EST type)

| | | | Producers of education EP1 . EP2.....EPI | | Taxes less subsidies on products | Total output of education products | Imports of education products | Total resources of education products |
|--|--------------------------|----------------------------------|--|----|---|---|--|--|
| Education products/ characteristic | Products in education | EC1 . EC2 . . ECi | A1 | A2 | (T-S) | TOE (P1) | I | Total resources of education products (TRE) |
| Output of Education | | | B1 =∑EP1; ∑EP2...∑ EPI | B2 | Total (T-S) | P2 | Total Imports | TR |
| Output of Non-education | | | C1 | C2 | | C5 | | |
| Total Output | | | D1 | D2 | | D3 | | |

The Education Supply and Uses table type measures the relation between the producers of education on a product basis and it aims to show how education resources, are available for intermediate consumption, final consumption.

Table A.1 is in line with the core supply table in the National Accounts. In row it shows the availability of products in education and in column it shows the output of the producers in education by type education products and non-education.

Table A.2-Education Uses Table type (EUT type)

| | | Producers of education EP1 . EP2.....EPI | | Total intermediate consumption | Final consumption of Education products | | R&D |
|--------------------------|-----|---|--|---|---|----------------|-----|
| | | | | | Individu al | Collectiv e | |
| Products in education | EC1 | Intermediate consumption (CI) of education products by producers of education | | Total Intermediate consumption of Products in education by products in education (CIa) | IFC | CC | R&D |
| | EC2 | | | | | | |
| | ECi | | | | | | |

| | | | | | | |
|---|---------------------------------------|---|---|-------------------------------------|-------------------------------------|----------------------|
| | | | | | | |
| | Total products in education | (CIA) Total Intermediate consumption by producers | CIA | Total Individual consumption | Total collective consumption | Total R&D |
| | Other products (non-education) | Intermediate Consumption of other products by producers of education (CIb) | Total Intermediate consumption of other products (CIb) | | | |
| Total | | Total Intermediate Consumption (Total CI1) | Total Intermediate consumption (Total CI) | | | |
| Gross Value Added (GVA) | | | Total GVA | | | |
| Compensations of employees | | | Total | | | |
| Other taxes less subsidies on production | | | Total | | | |
| Gross Operating surplus | | | Total | | | |
| Mixed Income | | | Total | | | |
| Consumption of fixed Capital | | | Total | | | |
| Gross Fixed Capital Formation | | | Total | | | |

Table A.2 is equivalent to an incomplete uses table in the National Accounts. In rows describe the main uses of education products, which can be intermediate consumption and final consumption and a column for R&D was created similar to investment but with the designation of uses of R&D. This last issue is still and yet to be definitely decided. In columns it shows the production and generation of income accounts of the producers of education.

The concept of consumption is the actual final consumption for each individual and collective. The collective consumption corresponds to the expenditure in administration of education.

| Table B – Employment in the Education sector | | | | | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|-------------------------|-----------------------|-----------------------|----------------------------|----------------------------|----------------------------|
| Producers of Education products | Producers of Education (classification) | Total Employment | Employees | Self-employed | Total Employment | Employees | Self-employed | Total Employment | Employees | Self-employed |
| | | Number of persons | Number of persons | Number of persons | Number of Jobs | Number of Jobs | Number of Jobs | Number of Jobs | Number of Jobs | Number of Jobs |
| | | Number of persons | Number of persons | Number of persons | Number of Jobs | Number of Jobs | Number of Jobs | FTE or Hours worked | FTE or Hours worked | FTE or Hours worked |
| | | Number of persons | Number of persons | Number of persons | Number of Jobs | Number of Jobs | Number of Jobs | FTE or Hours worked | FTE or Hours worked | FTE or Hours worked |

The measurement of employment of education can be made for professional categories or industries or in a mixed way. It can be measured in number of persons, jobs, FTE and/or hours worked.

Table C- Total expenditure in Education plus R&D (producers of Education X Products in Education)

| | Producers of Education (classification) | Total |
|---|--|--------------|
| Products in Education (classification) | | |
| Current expenditure in Education | | |
| GFCF | | |
| Total expenditure in Education | | |

Table D – Current expenditure in Education plus R&D (Financing Agents X producers of Education) + Capital transfers by financing Agents

| | Financing Agents (classification) | Total |
|--|--|--------------|
| Producers of Education (classification) | | |
| Current expenditure in Education | | |
| Capital transfers | | |

Table E – Current expenditure in Education (Financing Agents X Products in Education)

| | Financing Agents (classification) | Total |
|---|--|--------------|
| Products in Education (classification) | | |
| Current expenditure in Education | | |

The current expenditure corresponds in the Education uses table type to final consumption, individual and collective plus R&D.

Table C measures total expenditure in education of each producer of education by products of education. Total expenditure in education is equal to current expenditure plus GFCF.

Table D measures current expenditure if the financing agents by producers of education plus the capital transfers granted by the financing agents.

Table E measures the current expenditure of the financing agents by products of education.

3. Implementation steps

The implementation of such a project requires a step by step approach. Therefore the main stages of the work that is being carried out are:

- No manual on SAE is available and therefore it is necessary to define a framework and methodologies for the compilation of SAE. The development of the conceptual framework took into account somehow the already existing tables of the health accounts on one hand and the questionnaire (UOE) on Education which is also an objective on the other.
- The definition of classifications of providers on education, services on Education and financing agents comes along the previous stage.
- It is important to set up the universe of all the producers engaged in the activities of Education services according to the classifications proposed for producers.
- After having set up the universe of units it is necessary to carry out an inventory of sources and to define methods for the compilation of the variables for the SAE. Sometimes there are several sources for the same variables and in order to have exhaustiveness and completion it is necessary to capture all the reliable available sources.
- The compilation of the variables in the proposed tables with the available sources is the following step.
- After having filling out through appropriate algorithms for the variables it is necessary to integrate them in a process of conciliation of the data by crosschecking all the data.
- A final methodological report describing the methodology and sources used for the compilation of the SAE.

State of affairs:

The state of affairs until this moment is:

- The conceptual framework has been proposed, analysed and adopted in the pilot project;
- The classifications were also adopted and in use;
- The group has finalized the universe of providers;
- Inventory of sources undergoing

4. Links with the National Accounts and the Questionnaire UOE

As previously mentioned the proposed framework is in line with the SNA93 although some differences exist in relation to the National Accounts. The Education supply and uses table type is fully in line with the SNA93 in terms of the methodology and concepts but there are some differences:

- The professional training carried out by the enterprises for the benefit of their own employees is considered in the core national accounts as intermediate consumption

whereas in the SAE is considered as a separate unit and used as final individual consumption.

- The products and producers are more aggregated in the respective national accounts classification and more detailed in the SAE. However it is possible to aggregate in order to obtain the National Accounts total for each level of the classification. The only exception is for some ancillary services and goods where the classification of products only refers to the part that is used for education purposes only.
- The Education uses table type is not fully in line with the corresponding uses table except for the education services. In the SAE the Gross Capital Formation (GCF) and exports are missing. This affects mainly the education goods because the classification of goods in the SAE only covers those goods that are used for education purposes only. It is important to remember that the education goods, as a classification item, are only a part of the respective total goods in the National Accounts and not the total type of the respective product.
- However the production and generation of income accounts are fully in line with the national accounts.
- The classification of financing agents is fully in line with the SNA93

There are some differences between the SAE and the questionnaires UOE being this last more restricted:

- The questionnaire UOE applies ISCED which is equivalent to the classification of products in education. No other classification is used by the questionnaire.
- The questionnaire UOE only considers R&D carried out by universities whereas the SAE considers the total R&D even the part that is produced by enterprises for final use based on the assumption that somehow all R&D converts in education.
- The flows in the questionnaire UOE are not in line with the SNA93 although there has been an attempt to harmonize it. The flows in the SAE are recorded according the SNA rules.

5. Conclusion

The implementation of the SAE is undergoing and will prove very important for the users. The trade off with national accounts will improve the quality of the data and the use of detailed information.

Although the SAE is fully in line with the SNA93 there are some specific characteristics of education in relation to the core national accounts.

The specific treatment of R&D is a challenging one and is one step ahead with the National Accounts. In fact it envisage the treatment in the SNA revised because it is consider now as a proxy to investment that in the particular case of Satellite Accounts for Education induces education. This is a question that requires some reflexion.