

**12th Meeting of the Advisory Expert Group on National Accounts,
27-29 November 2018, Luxembourg**

Agenda item: 4.a

Satellite Account for Education and Training

Introduction

The satellite account for education and training (SAET) is one of the two accounts proposed in the Guide on Measuring Human Capital. Its purpose is to provide more detailed data on the expenditures on education and training, and the financing of these expenditures. It also aims to present data on the production of education and training by different institutional sectors their use as intermediate consumption by corporations and as final consumption by households and governments. SAET extends the production boundary of the SNA only slightly by recognizing own account production of training by enterprises. It is thus providing the basis for measuring the production of human capital using the cost-based approach.

In 2017 the Bureau of the Conference of European Statisticians (CES) established a Task Force to coordinate the pilot testing of SAET in countries with different circumstances and, on this basis, to develop a compilation guide. This report presents the progress achieved so far by the Task Force as well as some of the main recommendations with respect to coverage and scope of SAET, classifications to be used and measurement challenges.

Documentation

- Attached Report from the Task Force on Satellite Accounts for Education and Training

Main issues to be discussed

The AEG is requested:

- Provide its opinion on the issues raised in section V

Report from the Task Force on Satellite Accounts for Education and Training

AEG, 27-29 November, Luxembourg

I. Introduction

1. In 2017, the Bureau of the Conference of European Statisticians (CES) established a Task Force to coordinate the pilot testing of satellite accounts for education and training (SAET), to support the compilation of internationally comparable measures of human capital. Based on the pilot testing, a more detailed compilation guide for such satellite accounts will be prepared.

2. The purpose of SAET is to provide more detailed data on the expenditures on education and training, and the financing of these expenditures. It also aims to present data on the production of education and training by different institutional sectors and the use of education and training as intermediate consumption by corporations and as final consumption by households and governments. Furthermore, it supplements this information by non-monetary data such as enrolled students, adults in continuing vocational training or in lifelong learning and number of graduates presented in different breakdowns. SAET extends the production boundary of the SNA only slightly by recognizing own account production of training by enterprises. The SAET is thus providing the basis for measuring the production of human capital using the cost-based approach (which is one of the two main alternative approaches for measuring human capital, the other one being the lifetime income-based approach).

3. Section II of this report introduces the objectives and the work accomplished by the Task Force, section III presents the framework for constructing SAET, while section IV summarizes the recommendations with respect to the scope of the accounts and selected conceptual issues. The AEG is invited to provide its opinion on the questions raised in section V.

II. Objectives and Work Programme of the Task Force

4. According to the terms of reference (ECE/CES/BUR/2017/FEB/6), the Task Force is established under the CES for a period of two years (2017-2019). The Task Force will also consult with and inform the Inter-Secretariat Working Group on National Accounts (ISWGNA) and the Advisory Expert Group (AEG) on National Accounts of its work to ensure international coordination. The Task Force should ensure coordination with corresponding work undertaken by UNESCO and Eurostat. In June 2019, the Task Force will present its final report for adoption by the CES Plenary.

5. The objective of the Task Force is to develop a framework and coordinate the pilot testing of satellite accounts on education and training in countries with different economic circumstances and data availability. Based on the pilot testing, the Task Force will prepare a compilation guide that will help countries construct internationally comparable satellite accounts on education and training, which will support improved cost-based measurement of human capital.

6. More concretely the Task Force will undertake the following activities:

- a) Develop a framework for constructing satellite accounts on education and training, including the breakdowns of the various expenditures on training and education;
- b) Recommend a classification to be used for costs and products, and link to the classifications used in the national accounts;
- c) Identify the key variables, and the main and supplementary tables in the satellite accounts;
- d) Carry out pilot testing of the satellite accounts to test the methodology, data availability and quality;
- e) Identify best practices, recommend improvements to methods and data sources for developing cost-based measures of human capital; and
- f) Develop a compilation guide for satellite accounts for education and training.

7. Currently the Task Force includes the following members: Belarus, Canada, Germany, Israel, Italy, Norway (Chair), Russian Federation, United Kingdom, Eurostat, UNECE, UNESCO and UNSD.

8. Until now the Task Force has held three face-to-face meetings and held a number of teleconferences. It developed a more detailed work programme and started its substantive work with a face to face meeting in May 2017. During the meeting the Task Force agreed that the pilot testing will follow the framework outlined in chapter 5 of the Guide on Measuring Human Capital. The starting point for developing the SAET should be the national accounts data and the relevant feeder systems, with the supply and use tables acting as a framework for ensuring consistency. The SAET data should be extended compared to the SNA core system to provide estimates of in-house training (own account production) by enterprises.

9. The Task Force highlighted the importance of keeping the links and build on existing international work, namely UNESCO Methodology of National Education Accounts (NEA), UNESCO/OECD/Eurostat Manual on concepts, definitions and classifications (UOE Manual) and the respective data collections. The NEA framework and the UOE data collection use essentially the same data sources and provide similar sets of internationally comparable data. However, these data sets have several differences with the national accounting concepts and these differences should be well explained and documented. This is important to ensure proper mapping to national accounts, improve consistency and avoid duplication of work or confusion for compilers and users.

10. During the second meeting in June 2018 the Task Force reviewed the first experimental estimates of the countries and the outcome of the reconciliation exercise between UOE data collection and national accounts, which was carried out by Eurostat in several EU member states. The country pilots showed that, despite some measurement issues related mainly to training activities, setting up of a SAET is feasible using more detailed disaggregation of the data that are already included in national accounts. The government sector is the main player in education activities in all countries, therefore the main data sources are the government accounts (government finance statistics). This is also an area where good data are available globally. More challenging is to find suitable data for the private sector. Different surveys of private providers of education services and NPISH reports were used by the countries. The Task Force agreed on the main principles, definitions and classification for the SAET framework and proposed lay outs for the core and supplementary tables. It also discussed detailed outlines of the chapters of the compilation guide.

11. Now the Task Force is nearing completion of its work. The results of the country pilots were reviewed at the third meeting held at the end of October 2018. Belarus, Canada, Israel, Norway and United Kingdom have completed their estimates for education and are currently working on the estimates for training activities (including in-house training). The Task Force followed up on several conceptual issues, such as clarifying more precisely the scope of SAET, confirming the applicability of the proposed classifications, reviewing possible methods and sources for estimating in-house training by enterprises.

12. The Task Force also discussed the draft compilation guide and agreed on a timetable for the revision and finalization of the chapters by mid-January 2019. Suggestions and comments from the OECD WPNA and the AEG will be taken into account during final editing. According to the plans the draft guide will be presented to the CES Bureau in February 2019 with the intention of having it circulated for global consultation in spring 2019.

III. Principles, classifications and core tables

13. The SAET combines a functional approach with an activity and product analysis and it is largely based on monetary data already available from the national accounts, but it provides a more detailed description and assessment of the expenditures that contribute to the formation of human capital, and of the financing agents. As other satellite accounts, the SAET includes monetary and non-monetary data to broaden the analysis and this is made possible by the rich set of statistics on education already collected by countries in the context of the UOE data collection.

14. The SAET largely respects the current production boundary of education and training in national accounts, although slightly expands it to include the output from enterprise internal expenses on in-house training (own account training). The idea is to provide policy makers with more detailed data on the expenditures on education, and the financing of these expenditures. In addition, it provides for more detailed classification of education and training activities by purpose, which is based on ISCED and is currently not part of SNA. It includes the expenditures on associated products such as textbooks, tools and equipment directly used in the delivery of education and training. And finally, it further breaks down the purchases of residents from abroad and the domestic purchases of non-residents to estimate the import and export of education and training services.

15. In summary, the SAET expenditures cover the following main categories:

- a) Teaching, administrative and other activities in formal education/vocational training services
- b) Non-formal cultural, recreational and sport education and training activities
- c) In-house training by employers
- d) Associated products directly related to the delivery of education and training services
- e) In addition to current expenditures the SAET will show also gross fixed capital formation (including R&D) of the education institutions.

Defining Expenditures

16. The goal of the SAET is to compile the total expenditure on education in a way consistent with the National accounts framework. Table 1 summarizes how the supply and use framework can be used to estimate total current expenditure related to the education and training activities. Current expenditures for all education and training activities by purpose are

considered, that is, all (public and private) education costs carried out by educational/vocational training institutions and enterprises and the transfers to individuals. Where possible the items should also be split by education and training products.

Table 1 – Definition of Total Expenditure according the production approach and the expenditure approach

Item	Supply (production approach)	Use (expenditure approach)
1	<ul style="list-style-type: none"> ▪ Sales of education services by market producers: <ul style="list-style-type: none"> • equals sales of education services 	<ul style="list-style-type: none"> • Household final consumption expenditure • Expenses in enterprises related to buying education services (part of intermediate consumption) • Part of government final consumption expenditures (transfers in kind/purchased market production) • Exports (students from abroad)
2	<ul style="list-style-type: none"> ▪ Output of non-market producers of education services (government and non-profit institutions): <ul style="list-style-type: none"> • equals the total costs of production, i.e. the sum of <ol style="list-style-type: none"> a) intermediate consumption b) compensation of employees c) consumption of fixed capital d) other taxes on production less other subsidies on production 	<ul style="list-style-type: none"> • Household final consumption expenditure (fees) • Expenses in enterprises related to buying education services (part of intermediate consumption) • Government final consumption expenditures • NPISH final consumption expenditure • Exports (students from abroad)
3	<ul style="list-style-type: none"> ▪ Import of education services <ul style="list-style-type: none"> • related to education and training produced abroad 	<ul style="list-style-type: none"> • Household (final consumption) expenditure • Part of government final consumption expenditures (if relevant - transfers in kind, purchased production)
4	<ul style="list-style-type: none"> ▪ Output of in-house training provided by market and non-market producers (extension of SNA production boundary): <ul style="list-style-type: none"> • Produced in several industries Compiled as sum of compensation of employees and related enterprises expenses (part of intermediate consumption) 	<ul style="list-style-type: none"> • Imputed as intermediate consumption
5	<ul style="list-style-type: none"> ▪ Education and training associated products: <ul style="list-style-type: none"> • Valued as the sales of these products to households and enterprises • Produced in several industries 	<ul style="list-style-type: none"> • Household final consumption expenditure for textbooks, utensils, equipment directly used for education, etc • The part delivered to education institutions and enterprises for in-

		house training is part of their intermediate consumption and is covered in “output” (it must not be double counted, see point 2)
	Sum supply = 1+2+3+4+5= total current expenditure	Sum use = total current expenditure

17. The table allows to sum up the total current expenditure either from the supply side (production approach) or from the expenditure approach following the use perspective, or to combine the two approaches.

18. In addition to the current expenditure on education and training also gross fixed capital formation of education institutions should be presented to allow calculation of total expenditures on education and training.

Core and Supplementary Tables

19. The SAET consists of a set of main tables and some supplementary tables. The Task Force took as the starting point the tables suggested in chapter 5 of the Guide on Measuring Human Capital but considering the requests coming from compilers outside the national accounts community is working on a more simplified presentation. The proposed structure of the tables would be the encouraged lay-out of the accounts. Depending on different circumstances, each country could opt for more detailed breakdowns or group sectors that are not so relevant for their education activities.

20. The core tables include:

- a) supply and use tables of goods and services (at current prices) allocated by education and training products by purpose;
- b) resource and uses tables linking the sectoral information in the input-output framework with the institutional sector accounts, also allocated by educational and training products by purpose.

21. The monetary data from the main tables could be supplemented with non-monetary data such as:

- resident population, broken down by gender, age group and educational attainment
- number of enrolled pupils/students and the number of adults in continuing vocational training or in lifelong learning (broken down by gender, age group) by level of education (formal and non-formal)
- number of graduates by field of education, gender.

Classifications

22. Two types of classifications are elaborated in the compilation guide in order to provide internationally comparable presentations of SAET:

- Classification of production and financing units by sector

- Classification of education and training products by purpose.

23. Since the general intention is that SAET should correspond with the 2008 SNA the classification of producing/financing units is based on the SNA classification of institutional sectors.

24. The classification of education and training products by purpose is based on ISCED levels, with additional categories for non-formal education and training. It should be noted that these are not products as typically understood in the CPC, but a bridge table between the education and training products by purpose (EP) and CPC is established (see table 2).

25. The Task Force suggests to further break down the 4 EPs suggested in the Human Capital Guide into 7 categories: four categories for education (EP 0 Pre-primary; EP 1 Primary education; EP 2 Secondary education and EP 3 Higher education) and three groups for training (EP 4: Cultural, sports and recreation education activities; EP 5 Other education and vocational training and EP 6: In-house training of employees by their employers). The added detail for training should allow greater comparability across countries where practices may differ and where data challenges may exist particularly in initial estimates. Table 2 presents in more detail the coverage of the proposed EPs.

Table 2. Classification of Education and Training by Purpose

Education and training by purpose	ISCED	CPC ver. 2.1	
EP 0	ISCED 0	921	- Early childhood educational development; - Pre-primary education;
EP 1	ISCED 1	922	- Primary education
EP 2	ISCED 2-4	923 924	• Lower secondary (general & vocational) education; • Upper secondary (general & vocational) education; • Post-secondary non-tertiary (general & vocational) education;
EP 3	ISCED 5-8	925	• Short-cycle tertiary (general & vocational) education; • Bachelor's or equivalent level; • Master's or equivalent level; • Doctoral or equivalent level
EP4	Not included in ISCED	92911 92912	Cultural education services (piano and other music instruction; art instruction; dance instruction and dance studios; art instruction except academic; photography instruction) Sports and recreation education services (sports instruction; camps; gymnastics instruction; riding instruction; swimming instruction; martial arts instruction; card game instruction; yoga instruction, etc.)
EP 5	Not included in ISCED	92919	Other education and training services, n.e.c. (external) - training for car, bus, lorry and motorcycle driving licences - training for flying certificates and ship licences - services provided by music camps, science camps, computer camps and other instructional camps, except sports - computer training services

	93411	- management training services Vocational rehabilitation services for persons with disabilities (external)
	93412	Vocational rehabilitation services for persons with disabilities (external)
EP6	In-house training	Imputation

IV. Conceptual and Measurements Challenges

Links to other international guidelines on education data collections

26. SAET is a bridge between national accounts and other education statistics, such as UNESCO National Education Accounts, UOE data collection on formal education, other international data collections on education and vocational training. The core data sources and coverage of these data sets remain largely the same, but a number of conceptual differences remain due to historical reasons, different purposes, uses and compiling institutions/units.

27. Unlike other education statistic sources, the SAET will include all formal and non-formal education and training, including on-the-job training. Further, SAET aims to measure the education and training delivered to residents of a country and therefore it will include expenditures of resident students abroad and exclude the education and training of non-resident students, which is not the case in UOE data collection. Further differences with UOE data collection include the application of the accrual principle versus cash in UOE and the treatment of subsidies, scholarships and grants. The SAET treats the latter as part of financing education. An exception is student loans, which are not included in SAET at all. UNESCO NEA is slightly closer as coverage to SAET, but similarly to UOE records transactions on cash basis and includes all transfers in the total costs.

28. While the purpose, scope and use of the various data sets will vary, it will be important that the broad definitions and classifications used be aligned as much as possible and that the differences are clearly identified and explained. This will require communication and coordination between national accountants and education statistics experts both at national and international levels. The UOE-NA reconciliation exercise undertaken by Eurostat in several EU member states is a good example in this respect. Furthermore, review of the UOE Manual is underway, including work on improving the methods and definitions on household expenditure, ancillary services and public transfers. The Task Force and the national accounts community in general should follow the outcomes and, if needed, provide input to ensure better links to UOE education statistics.

Scope of education and training

29. Another issue discussed by the Task Force was how costs related to kindergartens should be treated in the SAET. The recommendation is to leave child care expenses outside the scope of the SAET, but certain borderline cases must be decided. For example, the countries in the Task Force have quite different starting ages for school (ranging from 3 to 7). Sometimes educational programs are included in the pre-primary level in the countries that have older starting ages. Thus, the Task Force decided to include only the education part of pre-primary education, when it is possible to separate it from child care and babysitting expenditures. It is recognized that there may be practical difficulties in making the split. It is proposed to use ISIC

851 (Pre-primary and primary education) as a proxy for the education part of pre-primary education and identify this component as a separate education category. This will make the coverage of SAET clearer in different countries and facilitate international comparability.

30. Concerning the coverage of training the Task Force decided to adopt a broad definition i.e. together with *CPC 92919 Other education and training services n.e.c* and *CPC 9341 Vocational rehabilitation services*, it should also include all personal and cultural activities classified in *92911 Cultural education services* and *92912 Sports and recreation education services*. The intention is to cover only the instructional part of the latter two classes if data sources allow. However, recognizing the practical limitations, a list of activities covered under these latter categories should be provided so the coverage and comparability of the estimates is clear. Similarly, cultural, sports and recreation education services should be distinguished as a separate category (EP 4) to allow easier comparisons.

31. E-learning is included in SAET but there are many practical difficulties related to its measurement. Paid on-line courses offered both by education institutions and other providers will be captured in the estimates using data from household surveys or company accounts. Free on-line courses provided by resident non-market education institutions will also be implicitly included in the total costs. The most problematic part are free courses provided by units outside of the education sector. Hence, freely-provided courses by non-market units would generally not be captured within these measures (such as informal learning on digital platforms). The Guide will highlight this as one of the measurement challenges where further work on developing data sources is needed.

In-house training

32. The scope of training in SAET includes training employees by employers: both in-house (produced by the enterprise itself) and external training (produced by third-party organizations). It covers training activities which have as their primary objectives the acquisition of new competences or the development and improvement of existing ones. In-house training of employees by their employers is classified as EP6 (In-house training by employers) in SAET. External training is classified as EP 5 (Other education and vocational training).

33. The training of employees by employers in the SAET extends the production boundary of the SNA slightly to recognize training activities as own account production of training.

34. In the current SNA, external training is already included as intermediate consumption and output of the corporations, NPISH and governments that provide training. But, in-house training is not included and will, therefore, be recorded as an additional product in SAET. For the industries of the market sector, the estimated output of training product is recorded as the output of the industries that provide in-house training which the industries then purchase as intermediate consumption. For non-market sectors such as NPISHs and general governments, the output of in-house training is recorded as a separate (new) output that is part of the final consumption by the non-market sector. Since the training costs are now allocated to this new output, an adjustment must be made to the other outputs of the sector such that total output remains the same.

35. The overall effect of including all expenditures incurred to in-house training of employees is an increase in output and intermediate consumption of the market sector. For the

non-market sector, there is no change to output, and intermediate and final consumption. But the composition of output and final consumption will change.

36. The cost of in-house training is the sum of compensation of employees on training and related direct enterprise expenses. The compensation of employees on training is the imputed costs of employee time spent on training, which refers to the actual training time spent during the paid working hours. It is estimated as the hours trained, (calculated as numbers of workers trained times average duration of training), multiplied by the average hourly cost of employees on training. Ideally, this is calculated for different types of workers cross-classified by industry, education, gender and age, as training participation differs by the characteristics of employees. The direct enterprise expenses include the labour costs of trainers, the costs for training centres, training rooms and teaching materials, and other training related expenses.

37. Training of employees can be also estimated from enterprise surveys such as continuing vocation training (CVT) surveys, that collect data on the number of participants on training, time spent on training, participants labour costs and the number of persons employed in an enterprise. An issue with this survey is that it often covers only enterprises with 10 or more persons employed in ISIC sections B to N, R and S, and therefore exclude parts of the economy. Furthermore, it is quite expensive and is usually conducted on a 5 year or longer cycle, so estimates must be done for the in-between years. Alternatively, the number of employees on training and the average duration of training can be obtained from household surveys such as EU Labour Force Survey and Adult Education and Training Survey that provide data on individual participation on training.

38. The direct costs of training can be obtained from enterprise surveys such as CVT. For the purpose of SAET, the direct costs of training must be divided between the costs of internal which is recorded in EP6 and external training which is recorded in EP5.

39. The general problem faced by the Task Force is that CVT and similar surveys are costly, not frequent (or ad-hoc) and quite rare in the countries outside of the EU. The lack of suitable data sources has prevented the Task Force from developing a more standardized methodology for in-house training. On the other hand, initial estimates have shown that in-house training could present a substantial share of the total expenditures on education and training. Presenting it in a separate EP will allow countries to start with experimental estimates of this component, while the comparability of the other education and training categories is not affected.

Internships

40. A related issue is the treatment of internships and apprenticeships. The Task Force's opinion is that if internships are paid and have characteristics of regular work they should not be included in SAET. Examples are doctors who after graduation need to work for several years before getting licence for individual practice. However, the supervision of interns, which is part of the general training process should be included as part of in-house training provided by private or public entities. Apprenticeships that are part of the formal education programme should be included e.g. cases where the students have not yet finished their education, and they are normally not paid (or low paid) and are not allowed to work on their own, often employers may be financed by the government for related costs. Costs related to apprenticeships should be allocated to the relevant EP, normally EP 2 or EP 3. The Task Force is aware that the circumstances for internships and apprenticeships may differ from country to country, which means that compilers need to judge what to include or not.

41. The scope of SAE includes the associated products such as textbooks and other equipment that are required solely for education (and therefore often provided by education institutions). However, transportation, meals, accommodation, medical and dental care should be left out (including from freely-provided government schemes if possible). The expenditures on education associated products should be allocated to the respective categories for education and training by purpose when sufficient information is available. If such information is not available, they could either be distributed according to the production of respective education service or shown as a separate line in SAET.

V. Discussion by the AEG

The AEG is invited to:

- Reflect on how the links and further alignment between national accounts and UOE Manual could be ensured.
- Present its views on the proposed practical approach to defining the scope and coverage of SAET and the proposed classification of EPs in section III of the report.
- Provide feedback on the measurement challenges presented in section IV, especially suggestions for additional methods and data sources that could be used for estimates of in-house training. How to encourage countries to compile such estimates in order to arrive at a more standardized methodology?

Annex I

Outline of the draft Compilation Guide

Chapter 1: Introduction

- Policy relevance of the Satellite Account for Education and Training
- The purpose of the Guide
- Chapters overview
- Main conclusions and way forward

Chapter 2: Principles, definitions and tables of the Satellite Account for Education and Training

- Introduction
- Principles and definitions
 - Accounting principles and geographical scope
 - Scope of education and training
 - Defining total expenditure
- Tables
 - Main tables
 - Supplementary tables

Chapter 3: Classifications for the Satellite Account for Education and Training

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- Classification of production and financing unit
- Classification of Education and Training Purposes
 - General Clarifications
- Transactions between Financing Sectors and Producing Sectors

Chapter 4: Methodology of the Satellite Account for Education and Training: Compilation and Analysis

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- Compilation of SAE
 - Compilation of the supply and use tables
 - Compilation of the resource/use tables
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- Main uses and applications of the SAE
 - Analysis and use of the supply and use tables
 - Analysis and use of the resource and use tables
 - Analysis and use of the supplementary tables on student enrolment
 - Analysis and use of the supplementary tables on employment, hours worked and labour compensation
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Chapter 5: Data Sources

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- Identifying sources of information
- Categories of sources
- Supply-Use/NA-based vs non-SNA-based sources
- General Government
-
- Households
- NPISH
- Financial and Non-Financial Corporations
- Rest of the world
- Non-sector-specific and supplementary data tables sources

Chapter 6: Comparison of international guidelines on education data collection

- Alternative approaches
 - UNESCO National Education Accounts (NEA)
 - French Education Account
 - UNESCO-OECD-Eurostat Financial data collection (UOE)
- Comparison of different approaches

Chapter 7: Country Pilots

- Belarus
- Canada
- Israel
- Norway
- United Kingdom