

Tebrake, James

Article

The role of satellite accounting in expanding the System of National Accounts

Eurostat Review on National Accounts and Macroeconomic Indicators (EURONA)

Provided in Cooperation with:

Eurostat, Luxembourg

Suggested Citation: Tebrake, James (2020) : The role of satellite accounting in expanding the System of National Accounts, Eurostat Review on National Accounts and Macroeconomic Indicators (EURONA), ISSN 1977-978X, Publications Office of the European Union, Luxembourg, pp. 53-76

This Version is available at:

<https://hdl.handle.net/10419/309839>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>

3

The role of satellite accounting in expanding the System of National Accounts

JAMES TEBRAKE ⁽¹⁾

Abstract: In recent years, there has been a rapid increase in the number of satellite accounts produced by national statistical organisations. The aim of this paper is to help understand the reasons for this increase and identify the need for further guidance and coordination. The paper presents the role of satellite accounting in the broader framework of the System of National Accounts (SNA) and suggests a typology that can be used to classify the different satellite accounts. Further, the paper provides a summary of international activities related to satellite accounting and a detailed overview of national practices collected through a survey which gathered responses from more than 80 countries. Finally, the paper identifies recommendations and possible next steps regarding the future development of satellite accounting and discusses the (potential) role of the international statistical community in improving this national accounting tool.

JEL codes: E01, E16

Keywords: System of National Accounts, satellite accounts

⁽¹⁾ International Monetary Fund (IMF); the author worked for Statistics Canada when the survey of national practices and the preparatory work for this paper were carried out.

1. Introduction

The digital economy, clean technology, culture, ecosystems, tourism, sport and recreation: each day national accountants receive requests for data to address an ever-increasing, complex set of questions posed by policymakers, businesses, think tanks, non-profit organisations and citizens. The System of National Accounts, 2008 (2008 SNA) is a powerful analytical tool containing a rich set of information, but this richness is not always apparent or sufficient. Often this information needs to be reworked, reconstructed, repackaged, or expanded in order for it to be effectively used to address these, more specific, policy questions.

Whither GDP, beyond GDP, is GDP still relevant? There is a growing debate about the validity of gross domestic product (GDP) and the SNA framework, more generally, and whether this system is sufficient to measure economic progress and even more so social progress. Much of the recent discussion has been driven by a substantial increase in ‘free information goods’ and advances in health care and communication over the last few years whereby individuals experience positive changes but do not see these reflected in the economic data released by national statistical organisations (NSOs). Equally, the SNA framework is often criticised for not addressing negative externalities that affect the sustainability of the economy. The latter may not only relate to the sustainability of the environment, but also to possible negative impacts such as the social sustainability of increasing inequalities.

It could be argued that much of the current debate around the validity of GDP dates back to The Commission on the Measurement of Economic Performance and Social Progress (CMEPSP). The CMEPSP was commissioned by Nicholas Sarkozy, President of the French Republic, who was *unsatisfied with the present state of statistical information about the economy and society*. The aim of the commission was to *identify the limits of GDP as an indicator of economic performance and social progress, including the problems with its measurement; to consider what additional information might be required for the production of more relevant indicators of social progress; to assess the feasibility of alternative measurements tools*.

Society and the economy are increasingly complex and changing at a rapid pace. Valid concerns are being raised as to whether the 2008 SNA can capture all the information required by citizens, businesses and governments to fully understand these changes. Users, at times, find it difficult to navigate through the sequence of national accounts or alternatively find that the accounts are too aggregated to allow them to answer their questions about a specific activity or sector. While the 2008 SNA is a powerful tool and provides users with highly relevant information, it has ‘boundaries’ which determine what gets measured and what does not get measured.

One way to expand the 2008 SNA is by allowing for the development of satellite accounts. Satellite accounts provide national accountants the flexibility to look outside the rigours of the core concepts and methods recommended by the 2008 SNA and experiment with new ideas and measures. Given rapid economic and social change, NSOs seem increasingly to be drawn by their users to look outside of the standard SNA framework and to develop an ever-increasing variety of satellite accounts.

This apparent proliferation of satellite accounts is raising questions from national accountants and international organisations as to the motivation behind the increase. Is the increase in

satellite accounting an indication that there is a problem with the scope and detail available in the core national accounts? Or alternatively, does the increase in the number of satellite accounts reflect the maturation of national accounting where improved methods and access to data are enabling national accountants to develop new products that respond to increased information needs? Or is it simply a case of NSOs further aligning their national systems with international standards where they use satellite accounts as a way to test out these new concepts and methods with users before integrating them into their core programmes?

Originally a country survey was conducted and this paper was prepared at the request of the Bureau of the Conference of European Statisticians (CES) to allow them to review national practices related to the development and processing of satellite accounts. The paper was prepared by Statistics Canada with inputs from Eurostat, the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Economic Commission for Europe (UNECE) and the United Nations Statistics Division (UNSD). It first presents the role of satellite accounting in the broader framework of the SNA and suggests a typology that can be used to classify the different satellite accounts to help frame the discussion. Section 4 presents the results of the country survey of national practices in satellite accounting and provides the current 'state of play' in satellite accounting. In conclusion, the paper outlines outcomes from discussions at the CES Bureau and presents an agreement on further work to be conducted in the area of satellite accounting.

2. Satellite accounting and the 2008 SNA

One of the strengths of the 2008 SNA lies within its flexibility. While the system lays out the concepts, accounts and accounting rigour required to produce a set of integrated and internally consistent set of accounts, it does afford the compiler the flexibility to vary and, in a sense, 'expand' the framework to address a specific need. At the limit this 'expansion' is referred to as satellite accounting.

The 2008 SNA distinguishes between two types of satellite accounts. One type of satellite account involves a rearrangement of the classifications or presentation (for example, more detail and alternative aggregations) of the core national accounts and the possible addition of complementary information. This type of satellite account does not fundamentally change the underlying concepts of the core national accounts ⁽²⁾ but provides an expanded perspective on a particular sector, group of products or activity (2008 SNA paragraph 29.5).

The second type of satellite account seeks to expand or supplement the underlying concepts of the core national accounts. This could involve, for example, expanding the concept of production (for example, including unpaid household services or volunteer activities as production), consumption or capital formation (for example, including human capital within the asset boundary). While this type of satellite account may also involve the use of new classification systems and presentations, the focus of this type is on alternative concepts (2008 SNA paragraph 29.6).

⁽²⁾ There are some cases where concepts such as the production boundary could be extended without affecting GDP, such as the internal production and use of certain goods and services.

The development of a satellite account involves extracting or enhancing detail contained in the core national accounts, so the results are directly comparable with established national accounts aggregates. Since the data, for the most part, are extracted from the core national accounts, the satellite accounts also inherit the high-quality nature of the national accounts.

As noted in paragraph 1.73 of the 2008 SNA, satellite accounts are also an excellent tool for national accountants to *explore new methodologies and work out new accounting procedures that, when fully developed and accepted, may become absorbed into the main SNA in the course of time* ⁽³⁾. In many ways they afford both the compiler and the user the possibility to experiment and test out new ideas. When those ideas have been fully tested and formed, they can then be integrated into the core national accounts.

In general, a large array of data is used to construct standard macroeconomic accounts. The data go through rigorous data quality validation and are integrated, reconciled and balanced in the process of producing national accounts. The production of satellite accounts from such data helps to ensure a high degree of quality and overall consistency within the system as a whole.

Most importantly for users, satellite accounts help them analyse a specific sector of the economy that they may not have been able to analyse using the core national accounts. In the absence of satellite accounts users are often left trying to reconcile data from different surveys and statistical products in order to get a complete picture of the size and structure of a particular sector. Often these data are not coherent and difficult to interpret. Satellite accounts can remove the confusion by bringing these data together in a common framework and ‘forcing them into line’.

A final positive externality of satellite accounts is that they often spur data development activity or investment that improves the quality of source data. These data developments not only benefit the satellite account programme but can have positive spill-over effects on the original data source and a countries’ core national accounts programme.

3. A typology of satellite accounts

Prior to analysing the results of the survey on national practices in the compilation of satellite accounts, which follows in Section 4, it is important to establish a typology to help frame the discussion. As noted above, the 2008 SNA identifies two broad types of satellite accounts (2008 SNA paragraph 29.5). These two types provide a starting point for developing a typology for satellite accounts. While the SNA distinguishes between these two types (referred to as Type 1 and Type 2) of satellite accounts it provides little guidance regarding nomenclature and terminology.

⁽³⁾ More details are provided in Chapter 29 of the 2008 SNA.

3.1 Thematic accounts (Type 1)

Various statistical authorities have, over the years, referred to a certain group of satellite accounts as thematic satellite accounts. Thematic satellite accounts generally restrict their scope to a specific activity or group of activities or sector ⁽⁴⁾, and are predominantly constructed within boundaries of the conceptual framework of the 2008 SNA. Examples of thematic accounts include tourism satellite accounts, culture satellite accounts, or sport and recreation satellite accounts. These accounts tend to be activity based and involve regrouping, rearranging and repackaging existing national accounts information in a way that is more intuitive and accessible for users. They generally do not deviate in any significant way from the production, consumption and asset boundaries of the 2008 SNA or from the market price valuation principle. These types of satellite accounts are hereafter referred to as thematic accounts; see P. van de Ven (2019).

3.2 Extended national accounts (Type 2)

While the international community is gravitating towards using the term thematic accounts to represent 2008 SNA Type 1 satellite accounts, the same cannot be said for Type 2 accounts which tend to extend the core concepts of the 2008 SNA. A term that adequately describes Type 2 satellite accounts has not yet emerged. A common language for subgroups of individual accounts seems to be emerging such as well-being accounts, household accounts or ecosystem accounts, but a common term describing this family/group of accounts is not yet evident.

The common feature of Type 2 accounts is that they tend to extend or expand the concepts and boundaries of the 2008 SNA. For example, satellite accounts related to human capital extend the asset boundary of the 2008 SNA, while satellite accounts related to unpaid household work extend the production boundary of the 2008 SNA. This idea of going beyond the core concepts is common among Type 2 satellite accounts. They often go beyond measuring monetary, pseudo-monetary or even economic transactions. Another commonality is that they often involve imputing values for non-market products such as household own-account services, leisure time or ecosystem assets, and assets like human capital or social capital. Given the common theme of expansion and the fact that these satellite accounts tend to extend beyond standard macroeconomic transactions, for the purposes of this paper, they are hereafter referred to as extended national accounts — to convey the idea that they go beyond the generally accepted conceptual boundaries identified in the 2008 SNA.

⁽⁴⁾ Not to be confused with institutional sectors as defined by the 2008 SNA. Paragraph 29.21 of the 2008 SNA notes that in the context of satellite accounts *it is common practice to refer to such groupings of industries as 'sectors' even though they do not constitute institutional sectors as the term is used in the SNA*.

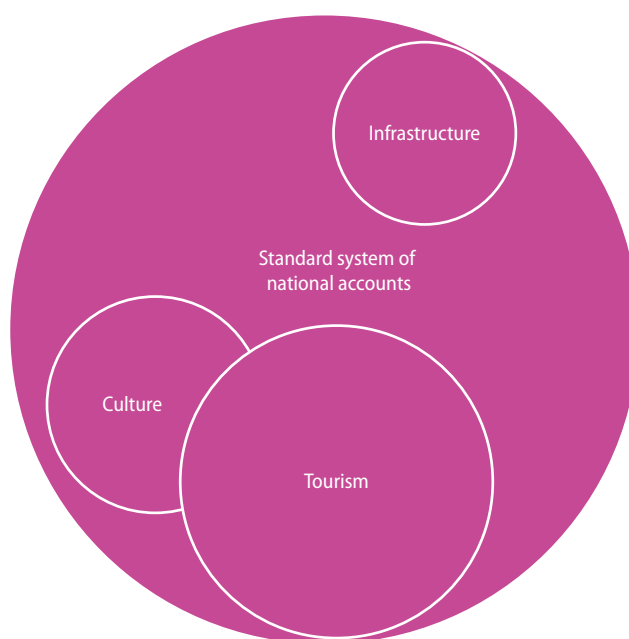
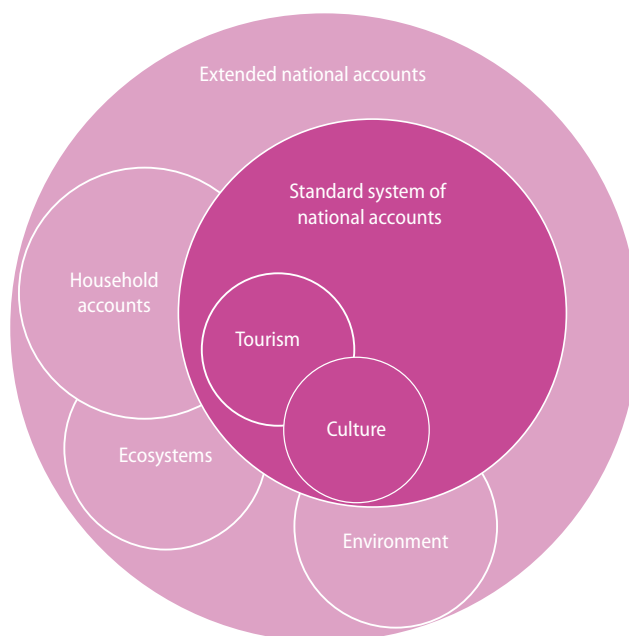
3.3 Standard system of national accounts (SSNA)

While the proposed typology distinguishes between the different types of satellite accounts, a term is also needed to reference the recommended accounts in the 2008 SNA. The term ‘core’ could be used (and is in fact used in the first part of this paper) but this could be understood to imply that these accounts are ‘correct’ or ‘of higher quality’ or ‘of greater importance’ than satellite accounts. Given this is not necessarily the case it is proposed to refrain from calling them the ‘core national accounts’. Since these accounts are economic by nature and they are ‘generally accepted’ by the international community as the standard set of accounts that countries should aspire to produce, it is proposed to refer to them hereafter as the standard system of national accounts (SSNA). It should be emphasised that this proposal does not alter the current 2008 SNA in any way — rather, a comprehensive typology is proposed to facilitate the description of satellite accounts. The result is three high level classes of accounts:

- the standard system of national accounts;
- thematic accounts; and
- extended national accounts.

Thematic accounts are broadly within the scope of the SSNA. In addition, one thematic account can overlap with another thematic account. For example, a thematic account related to tourism can overlap with a thematic account related to culture since some tourism activity is often also cultural activity. The relationship between the SSNA and thematic accounts is depicted in Figure 1.

Extended national accounts encompass the SSNA as well as a selected set of sustainability and well-being accounts. Similar to thematic accounts, the various extended national accounts can overlap. For example, a set of ecosystem accounts can overlap with a set of well-being accounts that quantify the positive or negative impacts that pollution has on the goods and services that can be derived from ecosystems. The idea of extended national accounts is depicted in Figure 2. The key question that needs to be addressed is whether or not to designate a set of such accounts as the ‘official’ extended system and encourage countries to develop these extended national accounts using internationally agreed concepts and methods.

Figure 1: Standard system of national accounts**Figure 2: Extended national accounts**

The above typology was used to analyse the results of the survey of national practices in satellite accounting. Table 1 shows the range of satellite accounts reported by survey respondents along with how each of the accounts was subsequently designated (thematic accounts or extended national accounts). It should be noted that the range of topics that were listed in the survey was not exhaustive and in some cases the topics did not align well with the concept of a satellite account; nevertheless, they are included in the list and analysis for completeness.

Table 1: Complete list of satellite accounts in the survey

Satellite account	Class
The following list of satellite accounts was included in the survey and respondents were asked to identify which of these satellite accounts they produced	
Environmental-economic accounts (SEEA including ecosystem accounting)	Extended
Non-profit institutions and volunteering	Extended
Human capital	Extended
Health accounts	Extended
Unpaid household activities	Extended
Education accounts	Extended
Social protection	Extended
Social accounting matrices	Extended
Distributional national accounts	Thematic
Tourism accounts	Thematic
Natural resource accounts	Thematic
Culture accounts	Thematic
Sport and recreation accounts	Thematic
Illegal/informal sector	Thematic
Agriculture	Thematic
Digital economy	Thematic
Transport accounts	Thematic
Ocean coastal economic accounts	Thematic
Technology	Thematic
Education and training	Thematic
Intangible capital	Thematic
The following list of satellite accounts was not included in the original list for the survey but were spontaneously identified by NSOs	
Care economy	Thematic
Softwood lumber	Thematic
Cannabis	Thematic
Pensions	Thematic
Water	Thematic
Sea	Thematic
Fisheries	Thematic
Telecommunication	Thematic
Travel and tourism	Thematic
Arts and culture	Thematic
Outdoor recreation	Thematic

4. State of play in satellite accounting — results of the country survey

4.1 International inventory of satellite accounts

As noted earlier, over recent years there has been an apparent increase in demand from users to develop satellite accounts, either because they no longer find the concepts in the SSNA appropriate or they are masking or do not properly account for emerging economic phenomena. In order to address these two questions the abovementioned survey on national practices in the compilation of satellite accounts was conducted. The questionnaire was developed through consultation with international bodies (UN, UNECE, IMF, OECD, Eurostat) and selected individuals from various NSOs. In addition to developing an international inventory of satellite accounts, the survey collected information for six themes:

- sponsorship/financing of satellite accounts;
- the work unit responsible for producing satellite accounts;
- the relationship between the satellite account and the 2008 SNA;
- frequency and timeliness of satellite accounts;
- data sources and methods used to construct satellite accounts;
- data gaps and demand for satellite accounts.

Over 80 countries responded to the survey on national accounts practices related to satellite accounts. In total, the respondents reported having developed 241 satellite accounts (covering over 20 different topics) — most of which continue to be actively worked on. The number of satellite accounts produced by a given country varied from 1 to 15. The median number of satellite accounts in production for a given country was 2, and the mean was 4 (3.7).

Figure 3: How many countries and satellite accounts were surveyed?
(count)

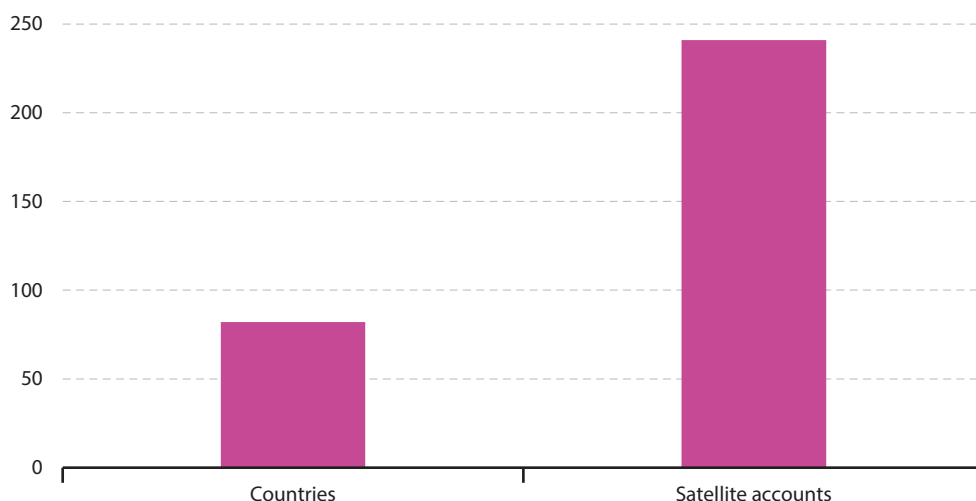
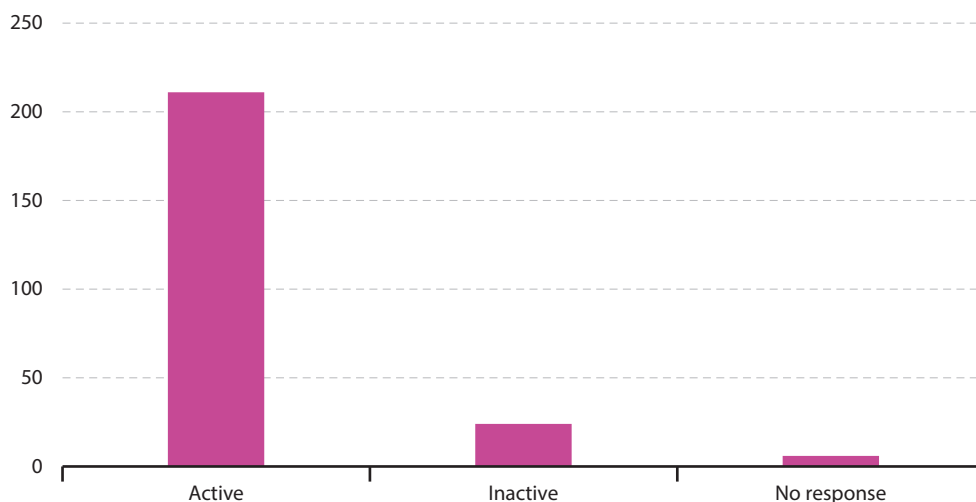


Figure 4: How many of these satellite accounts were active/inactive?

(count)



Certain satellite accounts were widespread across European countries. This can be explained by European Union legislation which sets common standards and serves common policy purposes. Examples of such legislated accounts include agricultural satellite accounts or environmental satellite accounts. Some other satellite accounts in Europe are implemented on a voluntary basis by countries which have a national interest in a specific field, like tourism or social protection satellite accounts. For these voluntary European satellite accounts, a harmonised methodology also exists.

The countries that were most active in satellite accounting are listed below. As noted above, European countries are quite prevalent in the list. Other countries actively engaged in satellite accounting included Canada, Columbia, Israel, Australia, China and Mexico.

The typology outlined in the previous section was used to classify each satellite account as either a thematic account or an extended national account. In certain cases, the accounts were considered to be both thematic and extended national accounts; in these cases, the account was classified under extended national accounts even if the account focused on a specific sector. Out of the 241 satellite accounts reported by survey respondents, the number of satellite accounts classified as thematic accounts was almost the same as the number of extended national accounts.

Tourism satellite accounts were the most common satellite account produced by NSOs followed by environmental-economic accounts. Satellite accounts that involve expanding the asset boundary for the 2008 SNA, such as human capital accounts, were less prevalent among the countries surveyed.

The survey also examined the reference periods covered by satellite accounts. The majority of the satellite accounts related to reference periods for 2000 or later. In total, nine satellite accounts covered reference periods prior to 1980, 40 covered reference periods in the 1980s and 1990s, and 148 covered reference periods for 2000 or more recent years. Most of the development over the last two decades was focused on health, tourism and environmental accounts.

Figure 5: Which countries were actively engaged in producing satellite accounts?
(count of different satellite accounts)



Figure 6: What were the most common topics covered by satellite accounts?
(count)

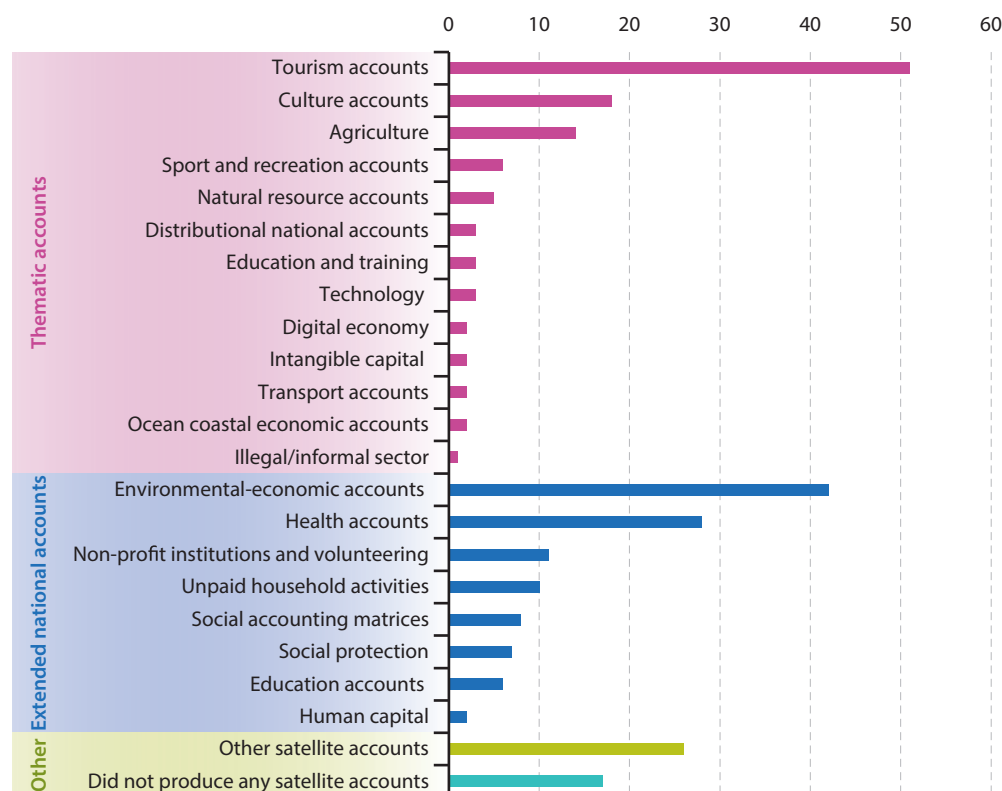
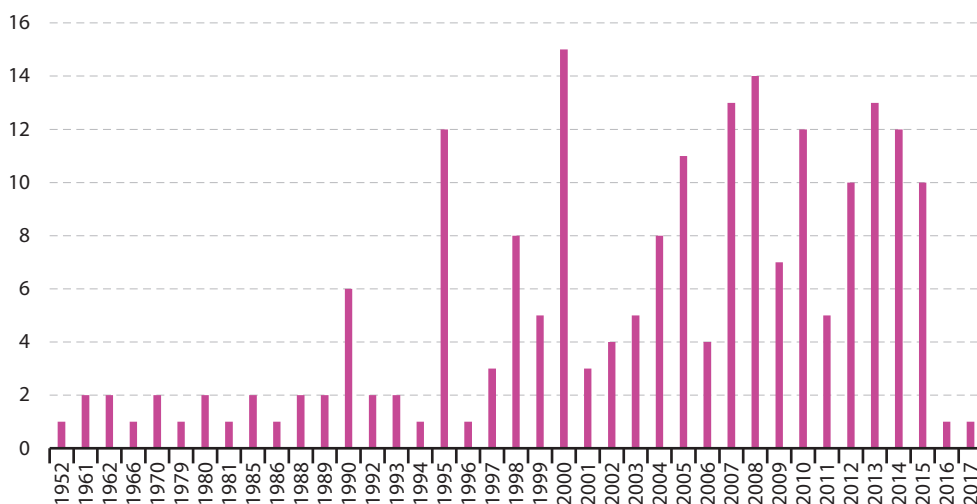


Figure 7: Which reference periods were covered by satellite accounts?
(count)



Note: for those reference years that are not shown on the x-axis, there were no satellite accounts produced by the NSOs that formed part of the survey.

4.2 Sponsorship and funding

The second part of the survey focused on sponsorship and sources of funding. The survey asked NSOs to indicate if the satellite account was sponsored by an organisation outside the national accounts programme and if the sponsor(s) contributed funds.

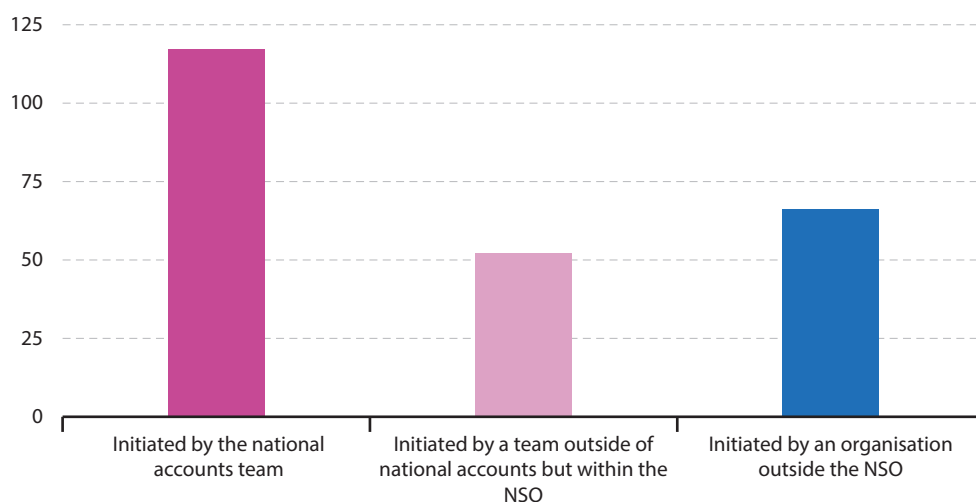
The results of the survey showed an almost even split between those accounts initiated by the national accounts programme located within the NSO and those satellite accounts initiated by organisations outside of the national accounts programme. Of the 241 satellite accounts represented in the study, 117 were initiated by the national accounts programme, 52 by a work unit outside the national accounts programme but within the NSO, and 66 by organisations outside the NSO; there were six satellite accounts where the body initiating the account was unknown.

Of the satellite accounts commissioned by organisations outside the NSO, most were related to thematic accounts. It appears that sponsorship and funding was more forthcoming when the product was closely aligned with the sponsoring organisation's mandate. Extended national accounts have a broader use and therefore sponsorship of these types of accounts was less prevalent. For example, in most countries there is not a logical sponsor for a human capital satellite account — while this account may be considered important to shed light on the comprehensive wealth of a country, it is unlikely that a specific organisation would sponsor its development.

Countries were also asked about the work units and areas responsible for producing satellite accounts within their national context. This area of questioning was intended to see if countries used the same national accountants to produce satellite accounts as for the production of their SSNA. The line of thought was that the satellite accounts would be more likely to receive the same rigour that goes into developing the SSNA data if they were organisationally embedded within the same work unit as the team responsible for the SSNA.

Figure 8: Who initiated the development of satellite accounts?

(count)

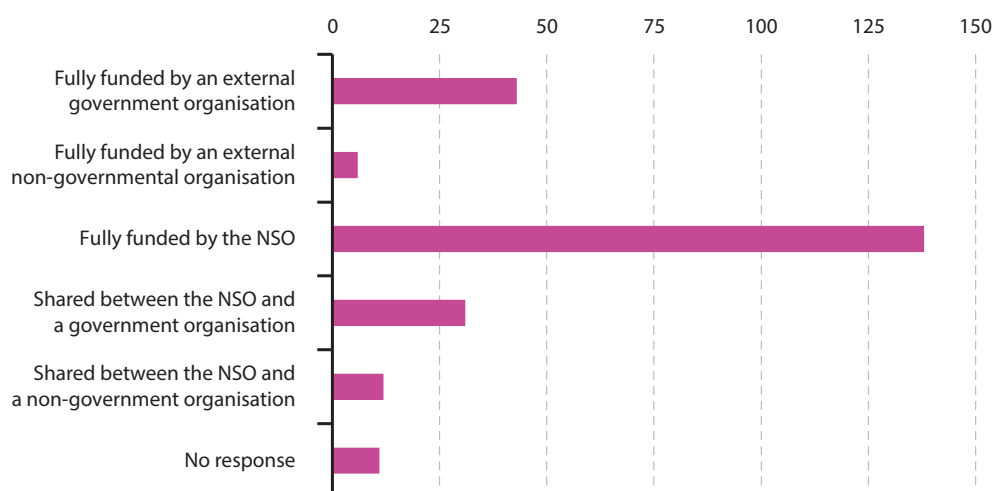


NSOs were also asked a number of questions relating to funding. In the majority of cases, the NSO indicated that the satellite accounts they compiled were fully funded internally by the NSO. This could have either been out of the NSO's ordinary budget or through special funds that were allocated to the NSO for the purpose of developing the satellite account. There were fewer instances where the satellite account was funded (partially or fully) by transfers from an outside organisation (government or non-governmental) directly to the NSO.

This is an important result given that one of the concerns about satellite accounting is that they can become politicised. If satellite accounts are sponsored by an outside organisation, there may be a tendency, real or perceived, for the accounts to be 'bent' to support a political point of view or outcome. If the funding is at 'arm's length', then this perception may be reduced and it could lend more credibility to the exercise.

Figure 9: How were the development costs for satellite accounts funded?

(count)



4.3 Periodicity and frequency

NSOs were also asked to report on the periodicity and frequency of the satellite accounts they produced. This line of inquiry was intended to determine if users demanded the same periodicity and frequency for satellite accounts as they did for the SSNA. Not surprisingly, the periodicity and frequency of satellite accounts differed substantially from the situation for the SSNA. This is an indication that satellite accounts help users understand the structure of an economy/society and the overall impact of an activity rather than growth or cyclical evolution of an activity or sector. Most satellite accounts were produced on an annual basis and released 12-24 months following the reference period. There were a few sub-annual satellite accounts and indicators released on a more frequent basis: these were most often within the domain of tourism and culture.

Figure 10: At what frequency were satellite accounts produced?

(count)

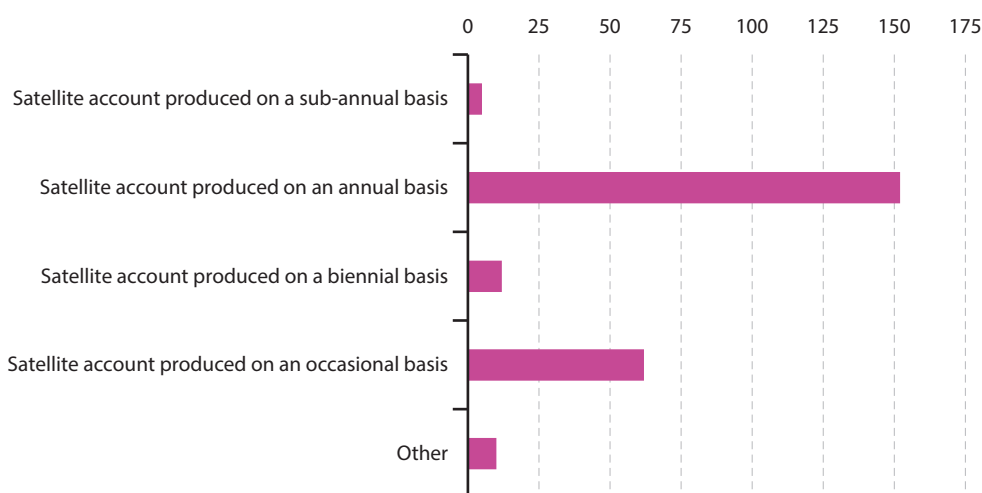
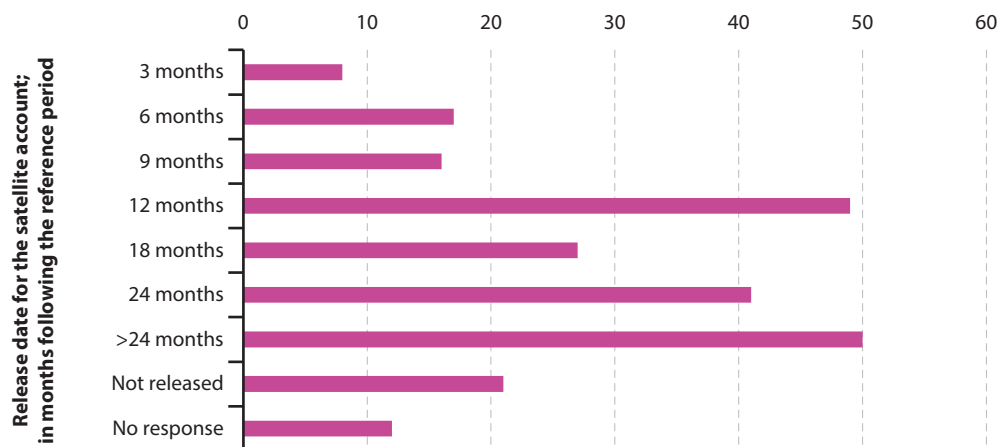


Figure 11: How timely was the release of data for satellite accounts?

(count)



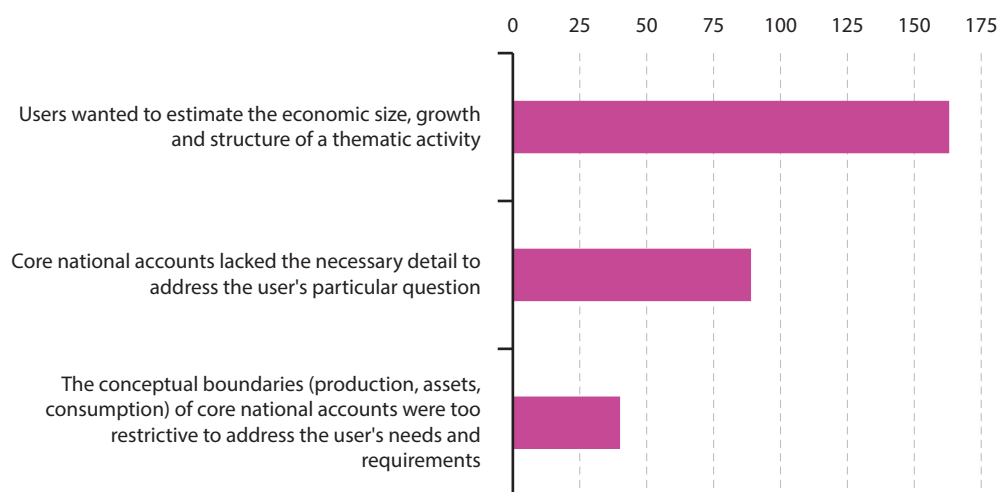
4.4 Motivation

A key objective of the survey was to understand better the motivation behind the development of satellite accounts. Respondents were asked to report on the main drivers behind the demand for their satellite accounts. Most respondents indicated that users requested satellite accounts to better illuminate a specific activity or sector that could not be easily analysed using the SSNA classifications. When users explore the SSNA to look for specific information on, for example, tourism or culture they only find a limited selection of the information they require. Users request satellite accounts so that data from the SSNA are rearranged to suit the type of analyses they would like to undertake.

Much of the motivation behind these user requests is to have an estimate for the weight of an activity or sector in relation to total economic activity. Being able to provide users with the share of thematic activity in relation to GDP is often a key motivation in the development of satellite accounts; this was apparent for both thematic accounts and extended national accounts. In many cases, users were interested in the size of an activity that was not conceptually covered by the SSNA. Is the stock of human capital larger than the stock of physical capital? What is the level of training when including in-house training activities by employers? In addition to the overall size of an activity or sector, respondents also indicated that users often requested a time-series (the longer the better) so they could understand how a sector was changing over time.

Over 55 % of the respondents reported that satellite accounts were developed to give more prominence to a particular activity by estimating its economic size, growth and structure. Very few respondents indicated that satellite accounts were developed because users felt the conceptual boundaries of the 2008 SNA were too restrictive and did not capture, for example, the welfare effects of free goods, or seamless access to information.

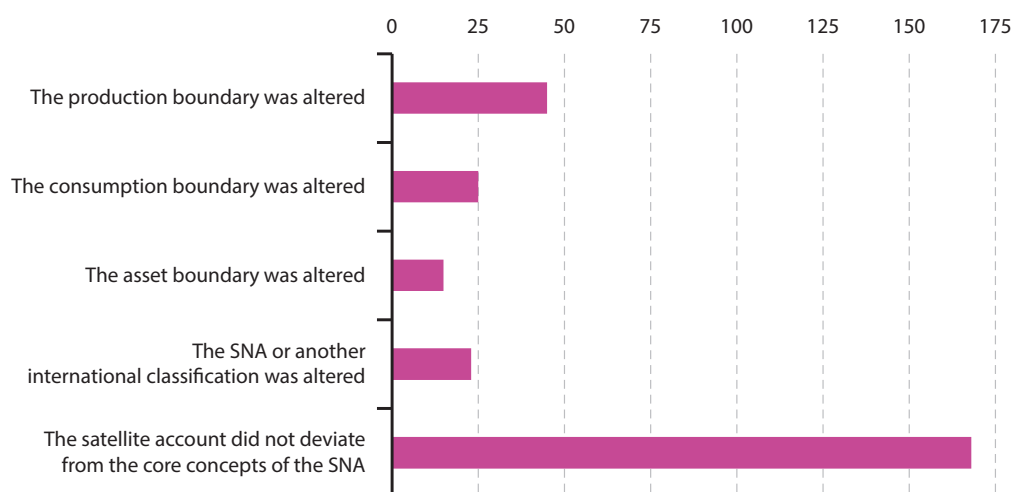
Figure 12: What was the primary reason for the development of a satellite account?
(count)



This is an important finding, given most of the discussion around the usefulness of GDP centres on its 'restricted' production boundary, which does not adequately capture certain benefits (for example, better health outcomes or increases in consumer surplus due to technological advancement), or does not appropriately account for negative externalities. This is not to say that these are not important areas of investigation. Indeed, the absence of responses may be more an indication of a lack of conceptual development in these areas making attempts at producing satellite accounts related to well-being and sustainability less credible and therefore evoking less demand from users.

In 61 % of cases, the satellite account did not deviate from the core concepts of the 2008 SNA. In cases where satellite accounts deviated from the core concepts of the 2008 SNA, most often the production boundary was expanded. In 16 % of cases, the production boundary was altered (such as giving a value to volunteering), followed by changes to the consumption boundary (9 %) and changes to the asset boundary (such as including human capital; 5 %).

Figure 13: How did the satellite account deviate from the core concepts of the 2008 SNA?
(count)

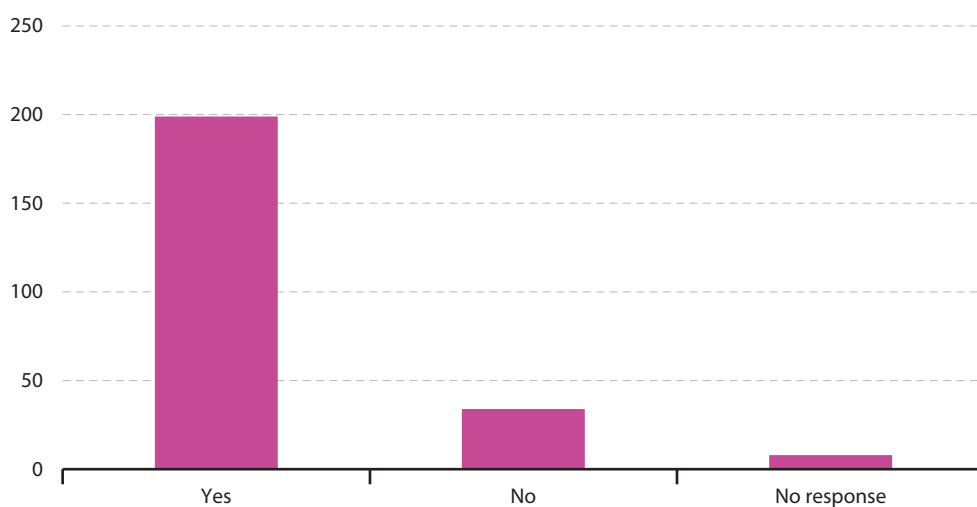


4.5 Guidance

NSOs and satellite account compilers were asked a number of questions about their compilation practices. Specifically, respondents were asked if they received guidance from the international community and whether or not satellite account sponsors either contributed to the development of the framework or provided metadata that helped in the construction of the satellite account.

In the vast majority of cases, users indicated that international guidance was available and that they used this guidance to help them construct their satellite accounts. Most of the motivation for following international guidance was related to their desire to ensure their final product compared with similar products produced by other countries.

Figure 14: Was international guidance available for developing the satellite account?
(count)



A significant amount of guidance exists regarding the sources and methods national compilers can use to construct satellite accounts. Much of this guidance is relatively recent and has been updated so that it is aligned with the 2008 SNA. An Appendix contains an inventory of such guidance made available to countries as well as the date that these handbooks, guides and manuals were published and the international organisation/group that developed the guidance.

Satellite account compilers also received input from government organisations outside the NSO or from non-government organisations. The survey explicitly asked about four types of input received when compiling satellite accounts. These four types were: inputs related to concepts and statistical methods; inputs related to definitions and classifications; the provision of data to help compile the satellite account; and other inputs. In general, compilers received inputs on all aspects for the design of satellite accounts. In a majority of cases, compilers received at least two key inputs for the development of satellite accounts and in at least 60 cases they received i) inputs related to concepts/methods, definitions and classifications and ii) data to help construct the account.

Figure 15: What type of inputs were received from organisations outside the NSO to help compile the satellite account?

(count)

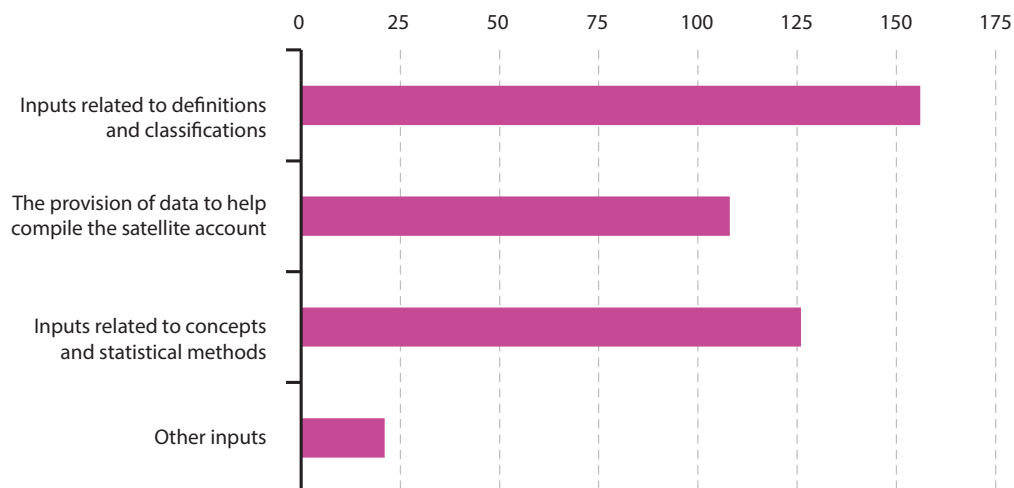
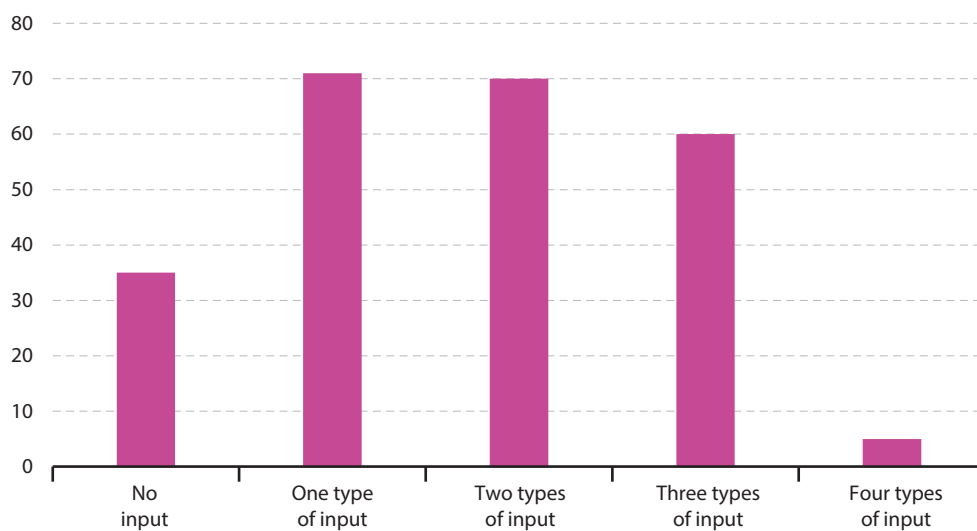


Figure 16: How many different types of input were received to help compile the satellite account?

(count)



4.6 Unmet demand

NSOs were asked to identify cases where a satellite account was requested but they were unable to respond to the demand due to various circumstances. In total, NSOs indicated there were 130 cases where a user requested a satellite account for which they were unable to meet user demand. This unmet demand was quite evenly split between thematic accounts and extended national accounts.

Figure 17: Unmet demand for the development of satellite accounts
(count)

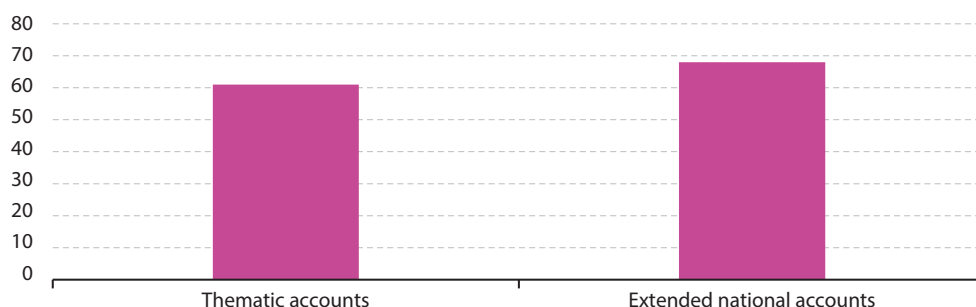
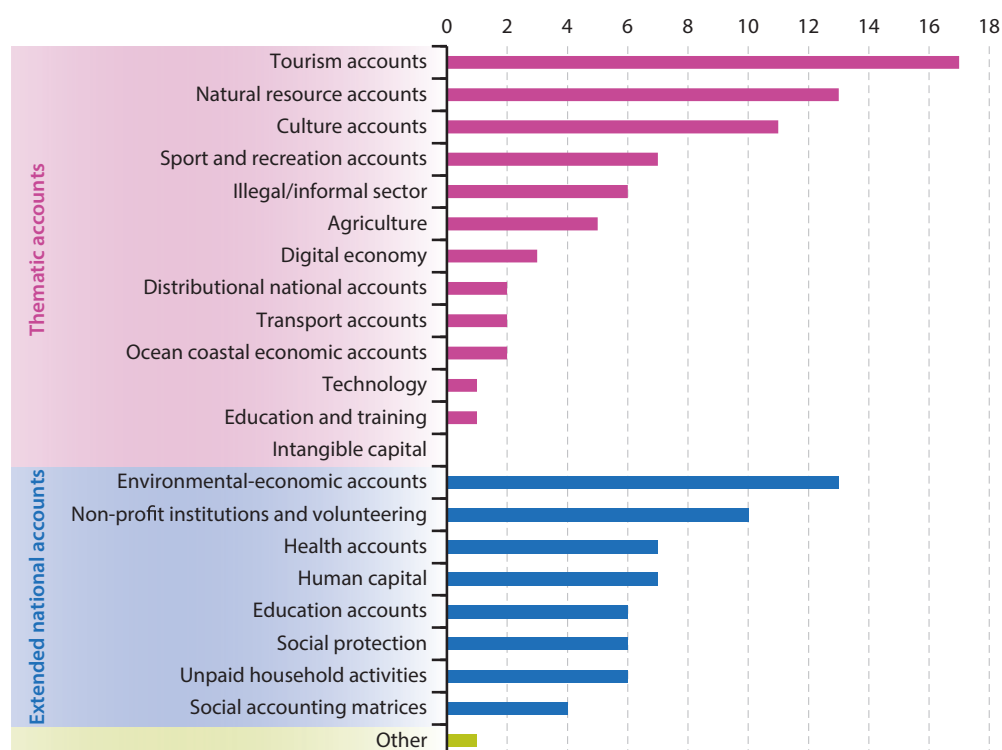


Figure 18: Unmet demand for the development of satellite accounts according to type of account
(count)



5. Conclusions

First, this paper demonstrates that national compilers of satellite accounts use guidance when available. This helps them ensure that satellite accounts do not become overly politicised since the compiler can reference international standards when identifying the definitions and boundaries of the satellite account under production or development. While a significant amount of guidance exists for various satellite accounts, these guides are developed independently. It may be useful for the international statistical community to develop a general guide to satellite accounting. This guide would recognise that there exists a standard set of concepts, terms, definitions, methods and techniques that are common (or should be common) across all satellite accounts. Such a general guide could be accompanied by and linked to existing guides provided for specific themes such as tourism, culture or infrastructure (each of which details specific information on sources and methods). A first draft of guidance for the compilation of thematic accounts was developed by the OECD during 2019, using the example of transport satellite accounts, see van de Ven (2019). The guidance describes the main steps to arrive at an enlarged set of the traditional supply and use tables as well as possible extensions of the institutional sector accounts. After consultation with various international partners, there are plans to finalise the guide and to make it available to the national accounts community during 2021.

Second, Statistics Canada and UNECE, in consultation with the author of this paper, are developing a wiki page presenting core information collected by the country survey. The page will serve as a reference providing information on existing international guidance for various satellite accounts. The wiki page will be maintained by the UNECE secretariat. There are plans to update it on a continuous basis in collaboration with the UNSD in order to enable the exchange of best practices across all countries and world regions. It is expected that this initiative will provide an opportunity to follow-up on the implementation of the OECD's general guide to satellite accounting and to take note of new innovations in satellite accounting (which may be beneficial for discussions in expert meetings). This online inventory of international guidance should be made public at the beginning of 2021.

Third, in order to increase the rigour and encourage the development of internationally important satellite accounts, a set of satellite accounts (existing or to be developed) should be identified and presented to the UN Statistical Commission for endorsement, in order to encourage their compilation by countries. This endorsed set of economic, social and environmental accounts would focus on addressing some of the well-being and sustainability gaps that are present within the current 2008 SNA (such as the measurement of unpaid household activities, environmental externalities, health and education).

Acknowledgements

The author would like to thank and acknowledge contributions from Catherine Van Rompaey (World Bank, formerly Statistics Canada), Andre Loranger (Statistics Canada), Tihomira Dimova (UNECE), Ilaria Di Matteo and Herman Smith (both UNSD), Peter van de Ven (OECD) and Andreas Dollt (Eurostat). The author would also like to thank two anonymous reviewers for their useful suggestions.

References

van de Ven, P. (2019), *Developing Thematic Satellite Accounts — The Example of a Thematic Satellite Account for Transport*, paper for the 13th Meeting of the Advisory Expert Group on National Accounts, 1-3 October 2019.

Appendix: inventory of international guidance for developing satellite accounts

Topic	Publication	Date published	Responsible organisation(s)/ group(s)
Environment and natural resource accounts			
Environment	System of Environmental-Economic Accounting 2012 — Central Framework https://seea.un.org/sites/seea.un.org/files/seea_cf_final_en.pdf	2012	UN, FAO, European Commission, OECD, IMF and World Bank
Environment	System of Environmental-Economic Accounting 2012 — Experimental Ecosystem Accounting https://seea.un.org/sites/seea.un.org/files/websitedocs/eea_final_en.pdf	2012	UN, FAO, European Commission, OECD and World Bank
Environment	Technical Recommendations in support of the System of Environmental-Economic Accounting 2012 — Experimental Ecosystem Accounting (White Cover) https://seea.un.org/sites/seea.un.org/files/technical_recommendations_in_support_of_the_seea_eea_final_white_cover.pdf SEEA-Water — System of Environmental-Economic Accounting for Water https://unstats.un.org/unsd/publication/seriesf/Seriesf_100e.pdf	2012	UNSD
Environment	Environmental taxes — A statistical guide https://seea.un.org/sites/seea.un.org/files/taxes_ks-gq-13-005-en.pdf.pdf	2013	Eurostat
Environment	Environmental subsidies and similar transfers — Guidelines https://seea.un.org/sites/seea.un.org/files/subsidies_ks-gq-15-005-en-n.pdf	2015	Eurostat
Environment	SEEA-Energy — System of Environmental-Economic Accounting for Energy https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf	2015	UNSD
Environment	Environmental goods and services sector accounts — HANDBOOK https://seea.un.org/sites/seea.un.org/files/egss_handbook_ks-gq-16-011-en-n.pdf	2016	Eurostat
Environment	System of Environmental-Economic Accounting 2012 — Applications and Extensions https://seea.un.org/sites/seea.un.org/files/ae_final_en.pdf	2017	UNSD
Environment	Environmental protection expenditure accounts — HANDBOOK https://seea.un.org/sites/seea.un.org/files/epea_ks-gq-17-004-en-n.pdf	2017	Eurostat
Agriculture	Manual on the economic accounts for agriculture and forestry EEA/ EAF 97 (Rev. 1.1) https://ec.europa.eu/eurostat/en/web/products-manuals-and-guidelines/-/KS-27-00-782	2000	Eurostat
Agriculture/ forestry	System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries (White Cover version published March 2018) https://seea.un.org/file/16260/download?token=wK_7dO4w	2018	UNSD and FAO

Topic	Publication	Date published	Responsible organisation(s)/ group(s)
Natural resources	Guide to Analyze Natural Resources in the National Accounts https://www.imf.org/external/pubs/ft/qna/na.htm	2017	IMF
Natural resources	Economy-wide material flow accounts — HANDBOOK https://seea.un.org/sites/seea.un.org/files/ks-gq-18-006-en-n.pdf UN Environment version coming soon	2018	Eurostat
Natural resources	Satellite account for the ocean	Under development	ESCAP and UNSD
Natural resources	Not available		
Human capital, education, health			
Human capital	Guide on Measuring Human Capital https://www.unecce.org/fileadmin/DAM/stats/publications/2016/ECECESSTAT20166_E.pdf	2016	UNECE
Education and training	Satellite Account for Education and Training: Compilation Guide http://www.unecce.org/index.php?id=53957	2020	UNECE
Education	Methodology of national education accounts (UNESCO, UNESCO IIEP, UNESCO UIS) http://unesdoc.unesco.org/images/0024/002457/245781e.pdf	2016	UNESCO
Health	A System of Health Accounts https://www.who.int/health-accounts/documentation/sha2011.pdf?ua=1	2011	OECD, Eurostat and WHO
Household accounts (including distributional aspects)			
Households	Handbook of National Accounting — Household Accounting: Experience in Concepts and Compilation, Volume 2, Household Satellite Extensions https://unstats.un.org/unsd/publication/SeriesF/SeriesF_75v2E.pdf	2000	UN
Generations	National Transfer Accounts Manual — Measuring and Analysing the Generational Economy http://www.un.org/en/development/desa/population/publications/development/NTA_Manual.shtml	2013	UN
Unpaid work	Guide on Valuing Unpaid Household Service Work https://www.unecce.org/fileadmin/DAM/stats/publications/2018/ECECESSTAT20173.pdf	2017	UNECE
Disparities	Manual on distributional national accounts	Under development	OECD
Non-profit institutions			
Non-profit institutions	Satellite Account on Non-profit and Related Institutions and Volunteer Work https://unstats.un.org/unsd/nationalaccount/docs/UN_TSE_HB_FNL_web.pdf	2018	UNSD
Globalisation and digitalisation			
Digital economy	Satellite account for the digital economy	Under development	OECD
Globalisation	Handbook on Accounting for Global Value Chains	Under development	UNSD

Topic	Publication	Date published	Responsible organisation(s)/ group(s)
Other industry/sector accounts			
Tourism	Tourism Satellite Account: Recommended Methodological Framework 2008 https://unstats.un.org/unsd/publication/SeriesF/SeriesF_80rev1e.pdf	2010	UN, UNWTO, Eurostat and OECD
Tourism	Statistical Framework for Measuring the Sustainability of Tourism	Under development	UNWTO and UNSD
Culture	Culture Satellite Account http://uis.unesco.org/en/topic/culture-satellite-account	Under development	UNESCO
Transport	International Transport Forum Task Force (ITF TF) on Transport Satellite Accounts (TrSA) aims to produce a manual https://www.itf-oecd.org/3rd-international-transport-statistics-meeting	Under development	ITF TF
Aviation	Aviation Satellite Account	Under development	ICAO and ITF TF
Technology (for example clean technology, artificial intelligence)	Not available		
Sport and recreation	Not available		