11th Biennial IFC Conference on "Post-pandemic landscape for central bank statistics"

BIS Basel, 25-26 August 2022

Digitally enhanced macroeconomic statistics manuals: the quest for methodological serviceability and compilation synergies[1]

Celestino Girón,
European Central Bank

[1] This presentation was prepared for the conference. The views expressed are those of the author and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the event.

Digitally enhanced macroeconomic statistics manuals: the quest for methodological serviceability and compilation synergies

Celestino Giron[1] [2]

Abstract

The serviceability of the system of international economic statistics manuals is hampered by the absence of digital versions that facilitate the navigation from one part of the system to the other. Moreover, the service from, access to, and navigation through the system are currently hindered by the presence of frequent overlapping areas across handbooks. We propose a concentric, overlap-free design for the distribution of methodological content across digital manuals, where the fundamental conceptual building blocks are all contained in a central body to which extensions are added for specific statistical domains avoiding any duplication of content. We discuss the advantages of such a model for the development and diffusion of methodological knowledge and the quality of official statistics.

Keywords: International Economic Accounting Statistical Standards, Digital manuals, 2008 System of National Accounts, Sixth Edition of the IMF's Balance of Payments and International Investment Position Manual, HTML

Contents

[1] European Central Bank (ECB).

[2] Elaborating on a concept note prepared by the same author in cooperation with Daniel Suriany (ECB) and benefiting from discussion with staff from the OECD and Eurostat.

1. Introduction

Methodological handbooks constitute basic building blocks of the economic statistics architecture. They provide descriptive models of the economic reality designed to become useful, objective and comparable tools for economic analysis and policy making. Their development has been the result of a constant worldwide collaborative intellectual effort, which has been a major contribution to our understanding of the economic reality.

The central element of the methodological ecosystem is the UN System of National Accounts (SNA), which provides an all-encompassing accounting framework for the recording of value, its generation, distribution and accumulation. A number of other manuals address specific macroeconomic statistics consistently with the SNA, like the IMF Government Finance Statistics Manual, or provide more detailed guidance on specific issues, like the UN Handbook on National Accounting: Financial Production, Flows and Stocks in the System of National Accounts.

Special status regarding its relation with the SNA has the Balance of Payment Manual (BPM), which addresses largely the same economic phenomena as the SNA, the description of all economic flows of all agents in an economy, but there consolidating out interactions with other agents in the same economy. Moreover, the European System of Accounts (ESA) constitutes a European version of the SNA suitable for legal enforcement in the European Union.

The methodological prescriptions in the different manuals are interrelated, in a sort of conceptual network that grows in complexity as more material is added, in particular if more specific documentation providing guidance, clarification or interpretation of the main manuals and developed in different contexts are also considered as part of the ecosystem. Navigating through this network, even if restricted within the realm of a single manual, might be as challenging as understanding the statistical concepts, classifications and methodological treatments themselves.

The system would benefit from a digital infrastructure that would facilitate access to and use of that body of knowledge through tools that bridge the navigation difficulty. Although Hypertext and HTML -the obvious solutions for establishing cross-reference links in a digital environment- were for long available when the last SNA was finalised -2008-, and more than ten years has elapsed since, no version of the system is currently in place that makes use of this technology. Developing a network of hyperlinks across the various manuals would increase the serviceability of the system to users, be them producers of statistics or users of statistical information.

The ongoing review of the system of methodological handbooks is an opportunity to take into account the inherent network nature of the system in the first place, and to develop as a consequence a content structure that facilitates the implementation of navigation features. The Communication Task Team, set up to support the review process in relation to communication issues, is examining different elements of a design of digital versions of the manuals. Moreover, the editorial teams working on both the updated SNA and BPM are currently developing tables of content and outlines of the manuals that consider to the needs stemming from the digitally enhanced handbooks.

This note contributes to the current debates by proposing a concept of concentric topology for the digital manuals that maximises the advantages of the

digital manuals by separating drastically shared methodological concepts from specific concepts, which would lie in different digital repositories, while preserving the conceptual interconnections between them. Apart from easing the cross-referencing across the ecosystem, a network or concentric topology for the system of manuals would also contribute to avoiding overlaps and conflicts between the various methodological prescriptions, and even to facilitate the drafting process itself.

This note presents this concept of concentric typology. Section 2 discusses on models of digital access and cross-referencing via hyperlinks. Section 3 proposes a concentric model for the system of methodological manuals. Section 4 reflects on the current process of review of the Economic Accounting statistical Standards in the light of the discussion in this paper. Section 4 concludes.

2. Building a cross-referencing architecture for the statistical standards

A natural choice for developing connectivity across standards is the use of HTML-based technology to describe content, so that "hyperlinks" can be used to create a "network" of interrelated content. Hyperlinks in HTML are powering the navigation in the internet, allowing interlinkages within and across web pages and so being the essential instrument for the internet to become a network, a web of resources. The economic statistics standards have all the features of a logical network, with for instance concepts in financial accounts that derive in details belonging to monetary statistics which in turn have implications for balance of payments cross-border financial transactions. Their logical model fits into what HTML and hyperlinks can offer.

Developers of a HTML-based hypertext network decide for a more or less granular, sparse network depending on a cost-benefit assessment of the work needed in each case. For the economic statistics standards, it seems reasonable that, as a minimum requirement, any textual reference within a given manual (e.g.. the usual calls from one SNA paragraph to another SNA paragraph to provide the reader with additional detail or extensions) is implemented as a hyperlink within the corresponding internet resource.

A second layer of interconnectivity might consist in adding cross-references from chapter to chapter across manuals, irrespective of whether the methodological prescriptions strictly require a direct link across the chapters. This would imply adding textual information compared with the traditional, non-digital manual versions to indicate and inform on the cross-manual navigation functionalities.

A third layer would also include links from paragraph to paragraph *across manuals* (and perhaps additional linking within the same manual), which, apart from requiring the introduction of additional text similar as (and in a larger scale than) in the case of the chapter-to-chapter referencing, would entail a great deal of additional conceptual work to ensure an appropriate mapping of the standards across handbooks. At the same time, these conceptual difficulties can be considerably eased if the design of the methodological content already takes into account the need to embed a network in it.

Different degrees of granularity and sparsity can be envisaged for this third layer of connectivity, ranging from just including cross-referencing paragraphs that deal

with the very same economic phenomena to more encompassing links that relate topics which present some, but not necessarily direct, connection.

In addition to support a network across official standards, HTML linking might be used to provide access from the standards to other methodological material that clarify or interpret them in different contexts (like compilation guides, clarification notes or research notes). Finally, HTML hyperlinks and the HTML capacity to embed different media resources might be used to enhance communication, explanatory or training material related to the standards. This extension, in particular if the additional material is provided as part of the standards' network, would require a careful design of the web pages hosting the manuals, which would likely yield a look-and-feel substantially different from the traditional flat physical or PDF versions of the manuals.

3. Concentric network model for handbooks on economic statistics

Recognising the knowledge network structure of the system of economic statistics, irrespective of its implementation in a specific set of handbooks, is key for improving its serviceability via navigation facilities. At the same time, the specific way in which the methodological content is distributed across the handbooks, i.e. the design of the system of manuals itself, might reinforce such network quality, and/ or make it simpler from a topological point of view, and so facilitate the implementation of the navigation functionalities using the HTML technology. We propose here a concentric model for the organization of content to empower the system as a network of resources and facilitate their implementation through HTML technology.

Although the current system of manuals already presents features of a concentric network having the SNA at its core, the handbooks present as well numerous overlaps that make the interlinks often intricate and obscure. This considerably complicates the implementation of the navigation solutions sketched in Section 2. Figure 1 below (left panel, 1.1) provides a graphical representation of the relationships between manuals when overlaps are allowed, showing intersection areas of Venn diagrams that represent overlapping methodological requirements.

A more efficient model for the distribution of content across manuals is presented in Panel 1.2 (right panel) where the central role of the core manual in not compromised by intersections with other manuals. The core body would be the repository of the central methodological requirements, including all fundamental principles, while the other elements would here only contain extensions to the core body for specific representation and analytical needs.

From the point of view of navigation across the network, this layout simplifies considerably the flow of references and facilitates its implementation via hyperlinks (this is illustrated in Figure 1.2 as arrows that only flow from the extensions to the core, as opposed to the two-direction, multi-handbook arrows represented in Figure 1.1).

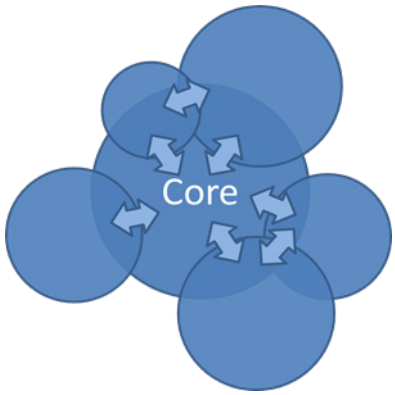
Apart from easing the implementation of navigation facilities, this topology brings clarity by avoiding the confusion potentially caused by overlapping requirements. The differences and inconsistencies that can currently be found in the

standards would be avoided by construction if an overlap-free model as sketched in 1.2 is followed.

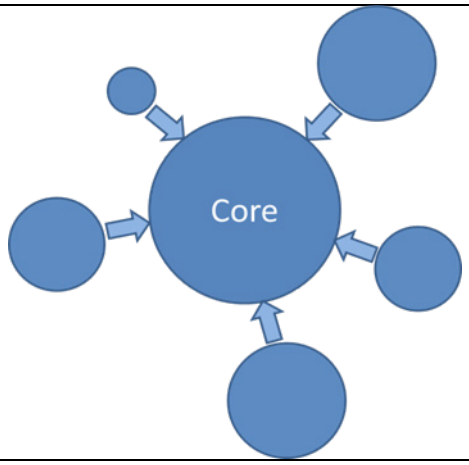
Moreover, the concentric topology provides methodological navigation certainty. In a context like that, methodologists and compilers easily find the area where they should look for the specific guidance they are looking for, diminishing the risk that relevant guidance is available in some other part of the system that they might be unaware of.

Economic statistics handbooks: content distribution models Figure 1

1.1Current model with overlaps across manuals



1.2 Concentric, overlap-free network model



The current model (left panel) presents overlaps between manuals (intersection areas in the diagram), leading to two-directional conceptual links across handbooks (between the central manual and the rest, but also between noon-central manuals).

The concentric model without overlaps (right panel), avoids intersection areas. The non-core manuals are extensions of the core principles. Conceptual links go form non-core manuals to the core manual

The model in Figure 1.2 would also facilitate the drafting and amendment of the handbooks by clearly delineating the various areas to be prepared. A natural division of labour arises where separate editorial teams would be in charge of the various extensions, each of them presumably under the leadership of an international organisation. The design without overlaps avoids unintentional inconsistencies and the duplication of efforts.

At the same time, the core body could also be distributed across leading editors, always avoiding overlaps, ideally allocating to the same team those extensions and core sub-areas more closely related to one another. Thus, for example the team and international organisation in charge of the extension for balance of payments purposes would at the same time be leading the drafting of the elements in the core body more closely related to that domain, like for instance the residency principle or the treatment of income for foreign direct investment links. The more cross-cutting aspects would also be distributed across editors and international organisation after mutual agreement, with the strict requirement that no overlap arises

4. The new standards: 2025 SNA and BPM7

The current process of review of the Economic Accounting Statistical Standards offers the opportunity to take into account the advantages (and costs) of digitally enhanced manuals since the beginning. The Communication Task Team (CMTT), one of the technical groups set up to provide support to the review process for both the SNA and the BPM, has the development of digitally enhanced manuals as part of its remits.

The development of digital manuals is not only, and even not fundamentally, an IT issue. As argued in this paper, the design of the distribution of methodological content across and within the manuals is key for taking full advantage of what the HTML technology can bring to the standards. In particular, the development of a content topology similar to the one presented in Section 3 would both facilitate the deployment of the digital versions and result in a system of interlinked methodological prescriptions of high serviceability.

The review processes are currently entering in the drafting phase, and the various stakeholders are already discussing on the corresponding outlines and associated distribution of contents. The outlines are being designed with a high degree of cooperation between the SNA and BPM editors, and as agreed at the beginning of the review process, there is a firm intention to share text across manuals, with minimum divergence between them. This goes in the direction of a concentric topology, the shared text constituting the content of the core body.

However, to fully embrace the topological concept, the shared text should present no discrepancy at all, and therefore be prepared with a more ambitious objective than the current intention to have "minimum divergence". At the same time, the shared text should have a certain degree of internal cohesion, so that the core body can be seen as a separate methodological manual and lie in a separate digital repository. Inter alia, the implementation of a separate repository requires then that the outlines under development consider separate chapters only containing common text and avoiding chapters that cover both common and specific text.

The review processes have focused on certain thematic areas which have been attracting the interests of methodologists over the last years. While this approach made sense in the review phase in order to identify the changes needed in the standards to correctly cope with emerging economic trends, it is dubious that a theme-oriented approach should be followed for the development of the manual outlines.

There is the temptation to include thematic chapters in the manuals to cover areas like globalisation or digitalisation, which are not per se methodological domains, but economic trends (which indeed might require certain changes in methodology, but do not constitute separate conceptual fields). This would inevitably lead to overlaps, just the opposite to what a concentric topology both requires and tries to avoid. This should be avoided.

This doesn't mean that there is no value in developing specific material on economic trends, but that those should rather be interpretations, basically of compilation nature, of methodological prescriptions that strictly follows a concentric topology. Such compilation guidance should rather be developed in separate manuals which as such would be part of the wide concentric topology an reside in the more external layers of it.

At the same time, it should be noted that not all priority areas followed in the reviews' research phase refer to economic trends. Thus, discussions on wellbeing and sustainability rather try to widen the scope of standard macroeconomic statistics and as such the theme constitutes a new methodological corpus that certainly deserves a separate methodological repository in the inner layers of the concentric topology.

5. Conclusion

The traditional way to disseminate statistical methodology, based on long, thick volumes devoted to the specific domains, falls short of the needs of the methodologist and compiler nowadays, and above all, of the possibilities that new technologies bring.

HTML- based resources interlink concepts in an agile way, facilitating the navigation through a given body of knowledge, and allowing moving from the general to the specific and the other way around at the will of the one accessing the information. The Economic Accounting Statistical Standards constitute and ideal field to apply this concept.

It is important to insist that when we talk about HTML- powered or digitally enhanced statistical standards we do not merely refer to the provision of additional digital versions of traditional manuals that are otherwise the same as they used to be before HTML technologies were available. We rather talk about a new paradigm in the design and distribution of methodological content that is geared by two objectives: facilitating the expression of the methodological content via HTML technologies and, more importantly, exploiting the benefits that such technology brings to the maximum in order to eliminate some of the drawbacks that the system of standards currently has. This includes the presence of overlapping and potentially contradicting methodological prescriptions, and the difficulties to promptly find all prescriptions relevant for a specific case study.

The ongoing reviews of the 2008 SNA and BPM7 is an opportunity to incorporate this concept in the design of macroeconomic statistics methodology for the forthcoming 15 years. We entertain in this context a concentric topological model where common principles and concepts would lie in a central repository accessible to all users of the system, and specific separate extensions would cover specific statistical domains. No overlap would be present throughout the inner layers of the topology.

In order to approximate this concentric model, some practices are suggested to the manuals' drafting teams. First, common, identical texts should be developed whenever possible, and such texts must constitute a coherent body so that they can all reside in a single repository. Second, chapters in the manuals should avoid sharing common and specific text to facilitate the separation of the two subsets and reinforce the overlap-free concentric structure. Finally, thematic content would rather lie in compilation guides, and not in the main manuals, to thus further contribute to avoiding the presence of conflicting prescriptions.

EUROPEAN CENTRAL BANK

EUROSYSTEM

Digitally enhanced macroeconomic statistics manuals: the quest for methodological serviceability and compilation synergies

Celestino Girón

***11th Biennial IFC Conference** on Post-pandemic landscape for central bank statistics*

26 August 222

What are we discussing?

On the surface (and partially wrong): ways to express traditional methodological manuals through digital resources, and, in doing so, increase serviceability by facilitating navigation

In reality: how to distribute methodological content across and within manuals seeking for maximizing serviceability. This is…

- Independent of (navigation) technologies, but
- Technologies make innovative answers to this question feasible

What are we after?

No overlaps within and across manuals	To avoid contradictions, conflicting recommendations, uncertainty on the methodological requirements
Structured multi-level organisation, from the general to the specific, from core principles to domain extensions	To facilitate “navigation” by compilers and users; to add certainty on where to seek for methodological advice
Unidirectional referencing within and across manuals, direct and indirect	To avoid convoluted “search paths”, potentially leading to inconclusive outcomes

What is proposed?

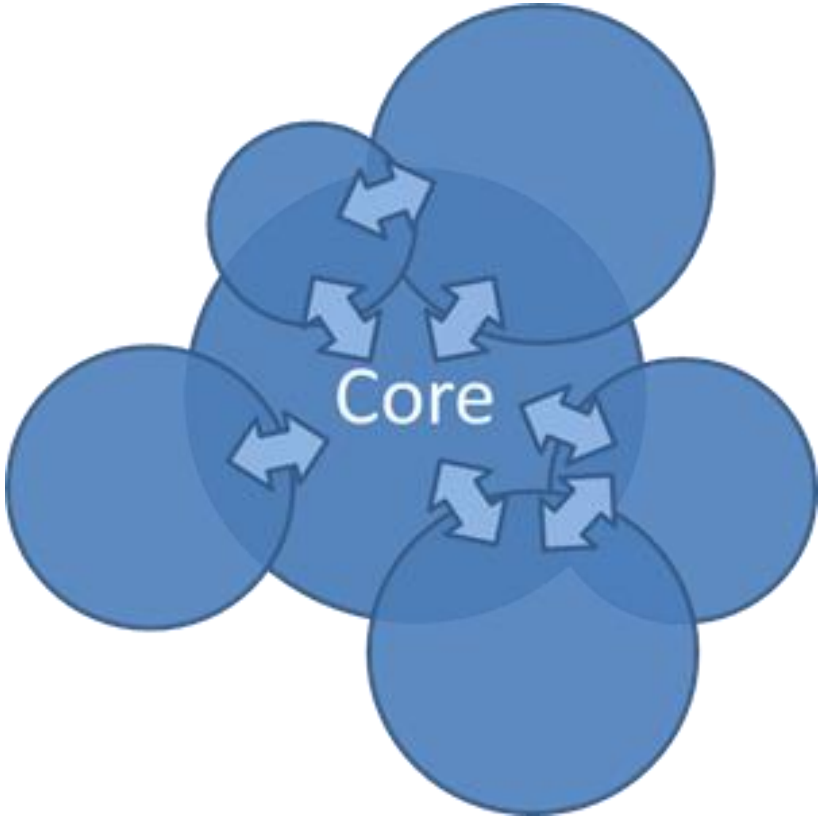
Concentric overlap-free, unidirectional topology, entailing a hierarchical structure with:

1. Core principles
    2. Specific domains
        3. Extensions
            4. Interpretations, clarifications
            5. Thematic manuals

… other material …

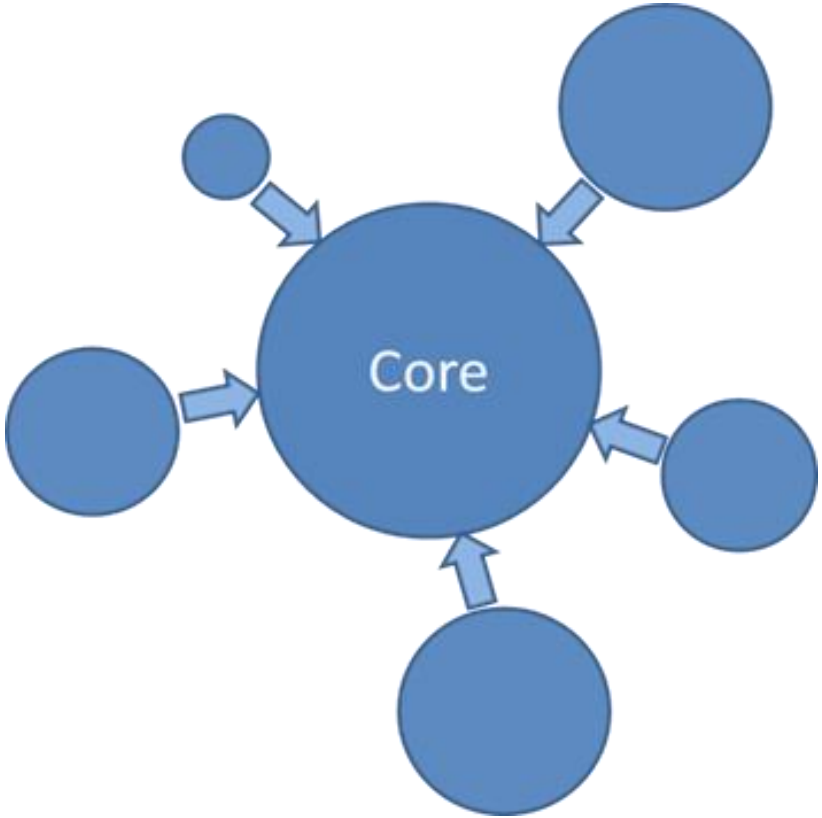
What is proposed?

What we have now



What is proposed?

Concentric topology



Recommendations (?) for future manuals

- ✓ *Separate more general content from more specific content when designing the content of the manuals*
- ✓ *Develop common text for common methodological questions*
- ✓ *Develop single, shared digital repositories for common content*
- ✓ *Avoid thematic chapters in the more central manuals*

Thank you for your attention !