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EUROSTAT REVIEW
ON NATIONAL ACCOUNTS
AND MACROECONOMIC
INDICATORS

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Luxembourg: Publications Office of the European Union, 2015

ISSN 1977-978X

Cat. No: KS-GP-15-001-EN-N

Theme: Economy and finance

Collection: Statistical books

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Printed in France

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Aims and scope

EURONA is an Open Access, peer-reviewed, scholarly journal dedicated to

- Methodologies, techniques and tools related to National Accounts and Macroeconomic indicators; and their use in supporting economic decisions;
- Standards, methods and practices used for the production of National Accounts statistics and Macroeconomic indicators;
- Analytical methods and results in subject fields making use of National Accounts data and Macroeconomic indicators.

EURONA aims to bring a distinctive perspective to tackle with different National Accounts related issues, also listening to oppositional voices and bringing in best practices and innovative perspectives from research and work at national and international level, in order to promote sustainable statistical information empowerment. EURONA's core objective is to provide a platform for the researchers, scholars, producers and users of statistics and other practitioners to come together and share their research findings, thereby facilitating progress and enhancement of National Accounts and Macroeconomic indicators.

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⁽¹⁾ Paulus.Konijn@ec.europa.eu

⁽²⁾ sartore@unive.it

Editorial

In this first issue of EURONA in 2015, four excellent articles offer thought-provoking views on a wide range of important issues with often long histories.

The first article is by Walter Radermacher and Anton Steurer who discuss whether it is necessary to produce natural capital accounts in order to inform society about its progress towards sustainable development. The authors argue that great care is needed in using the term natural capital and in monetising natural assets, as the results may not provide useful information to policy makers. They believe that statisticians should focus on developing an integrated information system on the state of the natural environment, from which relevant policy indicators can be derived.

The second and third articles have in common that they examine the relationship between national accounts and two of their most important data sources: government accounts and business accounts, respectively. Concepts and definitions are often different between government and business accounts on the one hand and national accounts on the other. This is not only a theoretical issue but also one with practical implications, as the government and business accounts provide much of the basic data for the national accounts.

François Lequiller analyses in detail whether the standards covering government finance statistics and those covering public sector accounting could be brought closer together. Today government finance statistics play a central role in economic and monetary policy making in the EU. The author argues that having a unique system from micro level to macro level would significantly strengthen the accuracy and credibility of these statistics. He states that convergence of standards is possible if compromises are accepted on both sides.

Itsuo Sakuma discusses the concept of goodwill as used, over the years, in business accounting and as it is included in the subsequent instances of the System of National Accounts (SNA). Goodwill is an asset in SNA, included primarily to be able to register business acquisitions. It is very hard to measure for national accountants and the author argues that, effectively, the SNA could well do without the very concept.

The final article addresses another issue that has been the subject of debate for at least the last two decades, which is the use of direct or indirect methods to seasonally adjust aggregate economic indicators like GDP. Enrico Infante, Dario Buono and Adriana Buono present a method that can help to decide *a priori* whether to use a direct or indirect method by analyzing whether seasonal patterns of the underlying series are similar or not. This method could be of great benefit to practitioners faced with the wide array of available methods for seasonal adjustment.

I hope you enjoy reading this issue of EURONA.

Paul Konijn

Editor of EURONA, Eurostat

Do we need natural capital accounts for measuring the performance of societies towards sustainable development, and if so, which ones?

Walter Radermacher ⁽¹⁾ and
Anton Steurer ⁽²⁾

1

Abstract: The past 20 years have seen substantial progress in relation to measuring sustainable development both in the policy field and in the statistical measurement field. However, there has been little progress with regard to the fundamental economic theory. This aspect cannot be ignored when considering what sorts of natural capital accounts could be useful for policy making in the domain of sustainable development. This paper presents some conceptual and practical limitations in the valuation of natural assets and environmental services. The authors conclude that a ‘narrow’ capital approach (i.e. monetising natural capital and adding it up to a total for wealth with the aim of making statements about past performance of societies) is not adequate for monitoring sustainable development. However, this approach can still be useful for assessment in specific cases at a smaller scale. Correspondingly, great care is needed when using the term ‘natural capital’ and associated monetary valuation outside of the scientific debate as it raises expectations that cannot be fulfilled and as it carries unintended but powerful connotations. Instead, the focus should be on establishing an integrated information system about the state and condition of the different components of nature, and the services derived from these components. Such a system could provide indicators for monitoring sustainability and for modelling the consequences of policy options.

JEL Codes: Q01, Q56, Q57

Keywords: natural capital, sustainable development, policy cycle, valuation of natural resources

⁽¹⁾ Walter Radermacher, Director-General, Eurostat.

⁽²⁾ Anton Steurer, Head of Unit ‘Environmental statistics and accounts; sustainable development’, Eurostat

1. Introduction

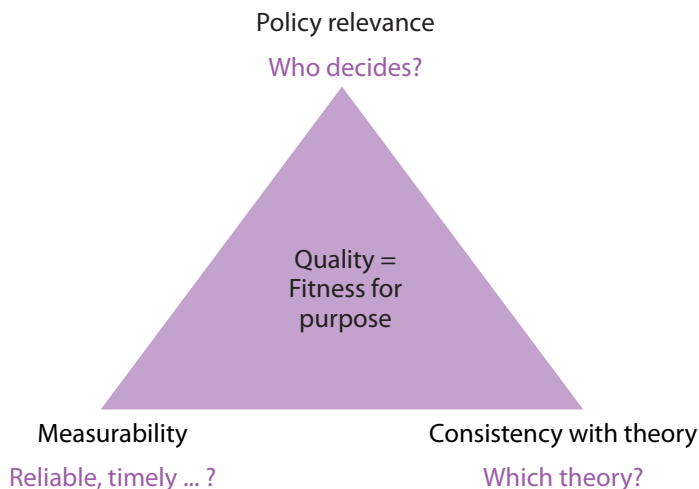
As humanity approaches the limits of the planet, there is an increased need to know more about where these limits are and for information that helps manage society's use of nature, as well as the need for information about natural assets. In the past 20 years, substantial progress has been seen in relation to measuring sustainable development both in the policy field and in the statistical measurement field. A major advance in statistics was the adoption as an international statistical standard of the System of Environmental-Economic Accounting (SEEA) — Central Framework by the United Nations Statistical Commission at its 43rd Session in 2012 (United Nations et al. (2014)). However, there has been little progress with regard to fundamental economic theory where the same old ideas are put forward to policy makers and statisticians.

The conceptual foundations of statistics are not a mere academic question. Statistics used for decision

making must be fit for purpose (see Lehtonen (2015)). It is thus essential to understand the stage or stages in the policy cycle for which natural capital accounts would be made (e.g. problem analysis, identifying and assessing measures, target setting or monitoring). This aspect determines key requirements such as reliability and the frequency which the accounts have to fulfil to be of use. In particular, the monitoring of performance requires much higher data quality than, e.g., the assessment of policy options.

The use of statistics for decision making faces potential trade-offs between statistical measurability, scientific soundness and political relevance (see Figure 1). The construction of information systems has to cope with these conflicting goals (Radermacher (2005)).

Figure 1: Fundamental aspects of quality in statistics used as evidence for decision making



This paper discusses, in particular, the question of natural capital, which is increasingly at the centre of the policy debate in the context of sustainable development. Relevant questions are: what do we mean by 'natural capital', how could we measure

it in physical terms and could we attach monetary values to it? The ultimate question is, to what extent the resulting statistics meet the expectations and needs of policymakers?

2. What do we mean by natural capital and by natural capital accounts?

The term ‘capital’ has very different meanings. In classical and neo-classical economics, capital is one of the factors of production (along with land and labour) and is produced, i.e. a stock of accumulated goods devoted to the production of other goods thus being able to generate income. In this meaning, capital excludes natural resources and human, social or institutional capital. Wider economic meanings of the term are broadly associated to stocks of goods or stores of value. Many in the general public would interpret ‘capital’ as money, government bonds, buildings or machinery for production.

The System of National Accounts 2008 (European Commission et al. (2009)) defines an asset as ‘a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time’. The System distinguishes between financial and non-financial assets. Financial assets are generally matched by financial liabilities. Non-financial assets are further divided into produced and non-produced assets. The category of non-produced non-financial assets includes items such as natural resources, licenses or goodwill. Natural capital is the extension of the economic notion of (produced) capital to the natural environment, i.e. the ‘stock’ of natural (eco-) systems that yields a flow of valuable (ecosystem) goods or services into the future.

Many somewhat different definitions of natural capital can be found. It is useful to look at a few of them. The outcome document of the UN Conference on Sustainable Development (Rio+20) in 2012 (see UNCSD (2012)) does not mention natural capital. Indeed, it does not contain the term ‘capital’ at all whereas the term ‘sustainable development’ occurs several hundred times. According to the Natural Capital Declaration, which was launched at the UN Conference on Sustainable Development, natural capital comprises Earth’s natural assets (soil, air, water, flora and fauna), and the ecosystem services resulting from them, which make human life possible.

The concept of natural capital features prominently in the European Union’s seventh Environment Action Programme to 2020 ‘Living well, within the limits of our planet’ (European Parliament and Council (2013)). The first priority of the 7th EAP is ‘to protect, conserve and enhance the Union’s natural capital’. The 7th EAP defines natural capital as the Union’s ‘biodiversity, including ecosystems that provide essential goods and services, from fertile soil and multi-functional forests to productive land and seas, from good quality fresh water and clean air to pollination and climate regulation and protection against natural disasters’. The programme also includes under its terms marine, coastal and fresh waters, land and forests, as well as air.

Neither the international System of National Accounts 2008 nor the SEEA Central Framework of 2012 defines natural capital. The term is not defined in the SEEA Experimental Ecosystem Accounting handbook completed in 2013 either. The SEEA Central Framework does define environmental assets, however. Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity. In the SEEA Central Framework, environmental assets are viewed in terms of the individual components that make up the environment, and are classified as follows:

- (1) Mineral and energy resources (oil, gas, coal, metallic and non-metallic mineral resources)
- (2) Land
- (3) Soil resources
- (4) Timber resources (cultivated and natural)
- (5) Aquatic resources (cultivated and natural)
- (6) Biological resources other than timber and aquatic resources (livestock, orchards, crops and wild animals)
- (7) Water resources (surface, groundwater and soil water resources)

In principle, for the assets listed above, monetary as well as physical asset accounts can be made. These accounts would describe the opening and closing stocks as well as the changes in these assets. For the aforementioned assets one can assume that they can be quantified ('counted') in physical terms and that their quantitative 'depletion' can in principle be calculated with relevance for economic accounts and decision making. However, for a number of these assets, producing reliable monetary estimates is very difficult. This is not only for practical reasons but also for conceptual ones, as we will see in the next sections. Even physical accounts are difficult to make in a number of cases, especially when qualitative changes (i.e. 'degradation') prevail. For example, the extent or quality of certain assets is not well known (e.g. ground water, soil or oil and gas in the ground).

Commonly, natural capital is used to refer to all types of environmental assets as defined in the SEEA Central Framework, but including also ecosystem assets not covered by the components above. Often the term natural capital incorporates broad notions of a range of assets that supply a broad set of services, including ecosystem services. For example, a forest would be seen as an ecosystem that not only provides timber but also sequesters carbon (thus protecting the climate), cleans the air, filters water, mitigates water runoff (and thus provides flood protection), or provides recreation. Finally, 'planetary' systems (mainly the sea and the atmosphere) could be added:

- (8) Ecosystems
- (9) Planetary systems

For these ecosystem and planetary assets, making accounts becomes even more challenging. The basis for monetary valuation becomes very limited and the meaning of aggregate results becomes at least unclear. Physical data about the extent, status and capacity of some types of ecosystems are still limited. A few countries are experimenting with pro-

ducing natural capital accounts, trying to compile the easier accounts first (see e.g. UK ONS (2014) or Australian Bureau of Statistics (2013) and (2015)).

The various assets listed above have very different characteristics. This matters for several reasons. First, there is the central question about accounting at the right level of aggregation. Secondly, we must address the heterogeneity of the types of natural assets. In this latter sense, two characteristics may be particularly relevant for the long-term temporal perspective that is at the heart of the idea of sustainable development. The first is whether an asset is used up by using it ('non-renewable') or not ('renewable' or permanently able to deliver a level of service). Many important natural assets are of the second type (e.g. climate, water, soil). The second key feature is that of interdependence or complexity. Often, 'non-renewable' assets are simple systems (e.g. natural gas fields or fossil ground water in a desert) but this does not mean that their extent or quality is well known. Complex interdependent systems pose additional challenges for predicting the impacts of human actions. Non-linear behaviour, tipping points, etc., suggest that risk considerations are more important than efficiency here. And, most importantly, even if all of these points could be solved, it would still not be clear how natural capital, say in Brazil, could be statistically accounted as a factor input for production of economic goods, say in France.

To sum up, the very compelling idea — for some — of using the notion of 'capital' in a broader sense, thus referring to the essential role of other production factors than produced capital for the long-term economic success of societies, seems to be faced with substantial obstacles, when it comes to its realisation. This could be seen as a minor problem, as long as the basic theoretical idea is good. However, as soon as we are in the aforementioned triangle of evidence based decision making, a theory without the possibility of real life application remains without relevance.

3. Capital accounts and measuring sustainable development

In Europe, the main discussion about frameworks for measuring sustainable development was in the period 2000–2005. After 2005, the focus shifted to measuring sustainable development with indicators. The capital approach was one of the frameworks discussed, in two very different senses. We can call them the ‘mainstream economic’ (or narrow) capital approach and the ‘framework’ (or wide) capital approach.

The basic idea of the **mainstream economic approach** is to measure whether (national) wealth is non-declining. To determine this, all types of assets (human, natural, economic...) need to be monetised and added up. Key features of the application of this approach are its national focus (i.e. it ignores cross-border effects) and the assumption of substitutability. Hence the approach works best for simple cases such as natural gas or crude oil reserves where the proceeds of extracting the natural resource are invested in the education of people and other forms of capital. The approach is of little use for natural assets such as the climate system or biodiversity.

The basic idea of the **capital approach as an organising framework** is that the asset base secures the future, so indicator systems must cover all main areas of assets in a wide sense (human, cultural, natural...). The approach recognises that monetisation at the scales involved is neither possible nor meaningful. Capital stocks and changes in stocks are measured with physical indicators (often proxies), e.g. human capital is described using the number of university graduates etc. This is a useful pragmatic approach for organising information but is not further discussed here.

In 2009–2012 a UNECE task force worked on statistical frameworks for sustainable development. The final result was adopted by the Conference of European Statisticians in 2013 (UNECE (2013)). The result seems to be a compromise acceptable to all and presents alternative ways to present sustainable development indicators including the capital approach as organising framework and the so-called

policy approach. The UNECE report does not advocate the narrow capital approach.

To mitigate some of the flaws of the narrow capital approach, the concept of critical natural capital⁽³⁾ has been introduced already in the 1990s. Critical natural capital is that part of the natural capital that delivers ecosystem services that cannot be substituted by other types of capital. Examples are freshwater resources, climate regulation and fertile soils (Millennium Ecosystem Assessment (2005)).

The mainstream economic capital approach is called ‘narrow’ as it has a very limited focus in applying standard neo-classical capital theory to the wide set of assets listed above. Many of these assets have characteristics that are not compatible with neo-classical theory. Nonetheless, the approach has been applied e.g. by the World Bank (e.g. World Bank (2006) and World Bank (2011)), by Costanza et al. (1997) and in the Stern review report (Stern (2007)). The main achievement of the reports has been one of raising awareness⁽⁴⁾. The relatively large monetary numbers support the view that the issues at stake are important. Some of the criticism these reports received has therefore been that the numbers are exaggerated and alarmist.

However, the more fundamental issue is that the values are neither necessarily reliable nor meaningful. Regarding the quality of the estimates, the reports have received criticism at many levels, including the assumptions used, the use of scientific data, the omission of key assets and the economic valuation (discount rates, cost and price estimates etc.).

⁽³⁾ For a summary overview see Brand (2009).

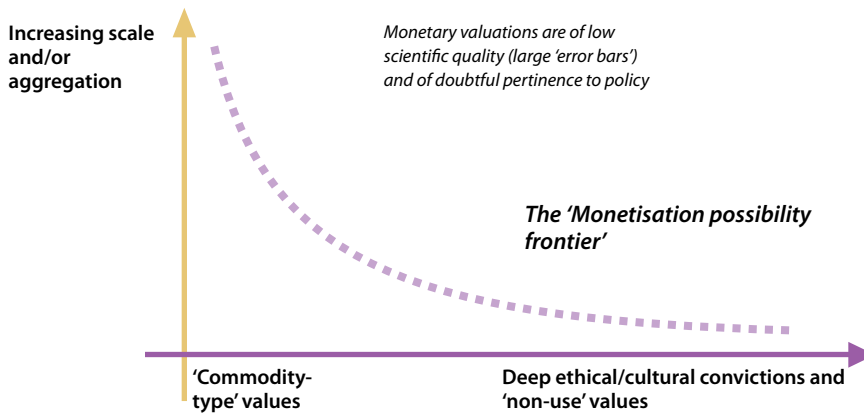
⁽⁴⁾ This is a key reason put forward by the WAVES initiative (<https://www.wavespartnership.org/en>): that ignoring the value of natural capital is likely to lead to decisions that endanger the poor.

This reflects the basic problems involved in such exercises:

- There is a massive lack of knowledge about the state and functioning of the phenomena at stake in physical terms (e.g. extent and characteristics, tipping points, etc.)⁽⁵⁾. The classic example is ecosystems. Soil is another example where much more and more systematic knowledge is needed (see, for example, Dominati, Patterson and Mackay (2010)).
- The valuation of these phenomena is both conceptually and practically very difficult. Some elements can be valued relatively easily, for others this is nearly impossible which makes any estimate incomplete.

These issues have led to the formulation of a 'monetisation possibility frontier' (O'Connor and Steurer (1999)), which uses two main dimensions (see Figure 2). Valuation works well for phenomena where both issues of scale and complexity, and cultural and ethical issues play no significant role. Valuation becomes problematic where the physical or temporal scales of the phenomenon, its interdependencies with other phenomena and the scientific uncertainties are large, and where ethical issues are important (issues of distributional fairness across space and time, existence value and heritage).

Figure 2: A stylised map of the 'Monetisation possibility frontier'



Beyond the 'monetisation possibility frontier', valuation adds an extra layer of complication and uncertainty and increases the error margins in the results. Furthermore, it creates a paradox and conflicts with basic economic thinking, when at a larger scale the functioning of markets is assumed to be

replaceable by technical-statistical experiments. In such a situation it is better to rely on management and monitoring purposes for the physical data, and concentrate scarce resources on reducing the error margins in this area.

⁽⁵⁾ This point is also made nicely in an article in *The Economist* (2002). The article underlines the importance of thinking in ecosystems rather than components and lays out a vision of an environmental data revolution based on remote sensing. The vision is still valid and advances have been made towards it but we are still largely flying blind.

4. Why is the 'narrow' capital approach not meaningful for (most) natural capital?

The main elements of the 'scientific DNA' of the 'narrow' capital approach are as follows:

- (1) A micro-economic view (i.e. the basic mainstream axiomatic setting in economics), in which the complexity of decisions is reduced to a one-dimensional choice that should be 'optimal' in terms of the most efficient allocation of scarce resources ('efficiency only').
- (2) It is assumed that all relevant components are valued, the impact of the choices is gradual (marginal), irreversibility doesn't exist and property rights of all commodities and capital goods are clear. In this world, the efficient allocation of scarce resources (financial, natural, labour etc.) is achieved through the invisible hand of the market.
- (3) For the most efficient choice between short-term consumption and long-term investments, the concept of 'capital' is introduced. The Hicksian income definition where income equals the net returns from capital fits here.
- (4) Sustainable development in this sense is nothing more than another term for the Hicksian income concept (See for example El Serafy (2013) or World Bank (2006)), which balances short term and long term interests. In a pure application this approach would lead to what is called 'weak sustainability', allowing unlimited substitution between all forms of capital (including natural). An assumption limiting the substitution of natural capital leads to a 'strong sustainability' concept.

At the macro-economic level, this conceptual frame is transposed to (macro-) economic-environmental accounting without any adaptations to the larger scale. If all interactions between stocks (all capital goods, assets, liabilities) and flows (activities like production, consumption including their internal/external effects on capital) are taken into account, the closing balance sheet in comparison to the opening balance sheet will tell us whether we have

performed sustainably.

The global financial crisis has already indicated some limitations of this approach. Even ignoring natural capital, the balance sheet at the macro-economic scale, based on market values, will not tell us much about sustainability. Indeed, the crisis has triggered some work that emphasises the dynamic and systems nature of the economy, which works much like an ecosystem with interdependencies, thresholds and tipping points. The crisis has also shown that unrealistic model assumptions can generate unrealistic results (Colander et al. (2009)) (or even dangerously misleading results that result in massively sub-optimal decisions). Applying the same logic to natural capital does not seem wise. Or in the words of Reinhard Selten: 'it is better to make many empirically supported ad hoc assumptions than to rely on a few unrealistic principles of great generality and elegance' (Selten (1991)). Herman Daly in the early 1990s (Daly (1992)) underlined that this ambition and focus on efficiency only is an example for a fallacy of misplaced concreteness, since the underlying assumptions are altogether not fulfilled in reality. In his view, three dimensions are relevant for the decision process ⁽⁶⁾:

- (1) Scale: When changes are not marginal, where is the turning point in the behaviour of systems, beyond which risks might explode? He explains this with the Plimsoll line of a boat. One can put more and more weight into a boat, without any increase of risk. If however the maximum weight is achieved, further loading would very quickly lead to a catastrophe.
- (2) Distribution: The use of natural goods and services leads very often to questions related to the (unclear) property rights of public goods. The oceans, global atmosphere, rainforests, ecosystems could be seen as global public

⁽⁶⁾ These principles are described in different words in an article by Daily et al. (2000). This includes that fundamental steps in valuation are the identification of possible alternatives and of the impacts for each alternative, and that political decisions are about incremental and not revolutionary changes.

goods. Their use and degradation is first and foremost a difficult point for political negotiations at international level.

- (3) Allocation: Once the problems of scale and distribution are solved, one might internalise externalities by the establishment of market mechanisms (taxes, trading schemes of politically defined limited pollution rights) in the most efficient way. This is the moment where economic efficiency comes in.

Global climate policy in principle follows this sequence: First, setting of global turning points for temperature increase ('2 degrees') and corresponding thresholds for greenhouse gas emissions; second, distribution of these global aggregates to national targets; and third, creation of market and other mechanisms.

The framework for the decisions of individuals is set in a system (scientific, political) that is external to markets. For the setting of these frames other mechanisms and tools are more necessary than market tools. Markets do their work within these frames and find an efficient allocation of scarce resources. What scarcity concretely means, was prepared in a step-by-step procedure that incorporates knowledge and assessment of natural sciences (i.e. scale) and political choices concerning fairness of distributions.

This is not a surprising result, neither theoretically (the conditions for the operation of a system cannot be set by the system itself) nor practically (market conditions such as tax and social insurance and legal frameworks are the prerogative of politics; they follow their own political logic).

While (or because) the political decision making process follows its own logic, economic theory and economic models do of course play a role in this process. In the example of climate policy, the decision makers will try to predict what the economic (and other) impacts of their decisions (or indecision) might be.

Scenario techniques, including econometric modelling of alternative pathways to sustainability, could provide valuable evidence of sufficient quality for the choices that societies have to make on their way

towards sustainable development. This approach would centre on methods for quantifying the opportunity costs associated with meeting specified targets or performance standards. These models should be closely synchronised with the available statistical database (See for example Bockermann et al. (2005)).

It is well known that such predictions carry large error margins and are subject to the same kinds of problems listed above for valuation. Nonetheless, for making the decision, even knowing the broad order of magnitude, is useful information.

However, trying to predict the economic impact of political decisions to help make these decisions is fundamentally different from setting up monetary accounts that should track whether we acted sustainably in the past. The former does not put a value on nature. It makes an estimate of the economic impact of a decision. The latter requires a much greater precision and comprehensiveness to be fit for the purpose of tracking development over time.

In summary, the 'narrow' capital approach seems to offer a nice, simple consistent theory for the integrated preparation of decision making at the political level. However, it has been demonstrated that this promise cannot be delivered. The elegance and appeal of the mathematical model contrasts sharply with the manifold difficulties of linkage with the real world: systems such as nature or societies don't behave in the necessary smooth, linear manner; abrupt changes, complexity and nonlinearity are characteristic features. Causal chains in terms of one-to-one relationships between activities and observable impacts are more the exception than the rule. Qualitative degradation of natural systems cannot be easily quantified or even counted in inventory lists. Monetary valuation of non-market goods (and services) is, at least when applied to goods of non-marginal size, reflecting more the model parameters than societal values.

A final point relates to the role of science and scientific advice in democratic societies. Valuation as part of making choices between different options and directions is fundamental for the transparency and functioning of democratic decision making processes. However, too much reliance on (non-

transparent) technocratic-scientific modelling for determining the outcome of such societal valuation can undermine and unduly limit the public debate (see for example Oxford Martin Commission (2014)).

This leads us to the conclusion that the capital approach remains an unfulfilled hope and promise for monitoring sustainable development. While valua-

tion is useful for assessing an incremental change, the total value of all ecosystems of the planet has no meaning. Instead of helping decision makers progress towards sustainable development, this approach is an obstacle because it does not generate useful and impartial information while it distracts from and discredits those approaches which are feasible and helpful in reality.

5. Conclusions

To determine whether natural capital accounts are useful or not we need to specify what they describe (which components of nature) and how to measure them (data in physical quantities or monetary data). The authors are of the view that great care is needed when using the term ‘natural capital’ outside of the scientific debate as it raises expectations that cannot be fulfilled and as it carries unintended but powerful connotations for some (financial capital, substitutability of elements of nature...) which others may consider unethical. To varying degrees, these considerations would probably also apply to social, human and other similar forms of capital.

In our view, the ‘narrow’ capital approach (i.e. the monetisation of natural capital with the aim of making statements about past performance of societies) is not adequate for monitoring sustainable development. Monetary asset accounts (balance sheets) that would be fit for the purpose of monitoring ‘sustainability’ are completely unrealistic for many key natural assets. The simple idea of monetising ‘everything’ and then adding it up to a total for wealth — for the purpose of monitoring performance — is misleading policy makers rather than providing useful information.

However, the ‘narrow’ capital approach can still be useful for assessment in specific cases at a smaller scale, e.g. where countries deplete their sub-soil assets (such as oil and gas or diamonds), to deter-

mine the amounts that should be invested in other forms of assets. Monetary valuation will play a role in assessing individual policies and individual projects rather than in target setting or monitoring. Even at the early stages of the policy cycle (where low quality data sets can still be useful), getting monetary estimates that are fit for purpose is not easy for many natural assets.

What else can statisticians do to support policy-making decisions in the domain of sustainable development? Scenario techniques and modelling the consequences of policy options provide valuable information for the choices that societies have to make on their way towards sustainable development. Therefore, natural capital accounts in the sense of integrated information systems about the state and conditions of the various components of nature are a very useful tool as part of environmental-economic accounting that should be further developed, starting with the layers expressed in physical units. With increasing population and increasing income, the management of nature becomes ever more important whereas the establishment of good quality information systems takes a long time. It is therefore appropriate to start investing in such integrated information systems now. In the meantime, indicator approaches should be further improved (see e.g. Eurostat (2013) or Eurostat (2015)).

Acknowledgments

The authors would like to thank Arturo de la Fuente, Marleen De Smedt, Jukka Jalava, Joachim Recktenwald and John Verrinder (all from Eurostat) as well as two anonymous reviewers for their valuable contributions.

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Towards convergence between government finance statistics and public sector accounting standards

2

François Lequiller ⁽¹⁾

Abstract: In the European Union, the macro monitoring of fiscal policies conducted by the European Commission is based on the national accounts (SNA 2008/ESA 2010). The best known indicators of these so-called ‘Government Finance Statistics’ (GFS) are the two famous ‘Maastricht criteria’: deficit should be lower than 3 % of GDP and debt should be lower than 60 % of GDP. At the same time, many EU countries want to introduce accrual public sector accounting practices at micro level for their public entities, more or less inspired by International Public Sector Accounting Standards (IPSAS). The paper explores the changes that would be necessary to both accounting systems in order to obtain, in the long run, an ideal and unique set of accounting rules which would apply from the micro to the macro levels of accounting. This requires that public sector accounting standards take into account the constraints enshrined in two EU Treaties and many EU Regulations, such as the definitions of the perimeter of consolidation and of the surplus/deficit, among several others. But it needs also, conversely, that GFS compilers take into account the public sector rules, when they are more relevant, such in the case of provisions, among others.

JEL codes: E62, H60, H83, M41

Keywords: accounting, government finance, national accounts, public sector, public deficit, public debt.

⁽¹⁾ François Lequiller is currently counsellor in the OECD Statistics Directorate. This paper only reflects his personal opinion and does not commit the OECD. The author comes from the national accounts/GFS world. He would like to apologise in advance to experts in public accounting for any possible misinterpretation of their standards.

1. Introduction

National accounts have adapted to changing user needs over time. This adaptation took the form of successive changes to the System of National Accounts — SNA (1953/1968/1993) up to the last version, the SNA 2008 (see European Commission et al. (2009)) and its brother system, the ESA 2010 (see Eurostat (2013a)), which was implemented in October 2014. At the same time, in Europe, the use of indicators based on national accounts for common EU policies, already widespread, has expanded further. The latest illustration is the ‘Macro-economic Imbalance Procedure’, based on a ‘scoreboard’ of 11 indicators, most of them coming from national accounts and/or the balance of payments. Within government accounts, the so-called European ‘6-pack’ regulations have nailed down the national accounts concept of ‘general government’ right to the heart of EU fiscal policy. This makes the use of ESA based government finance statistics (GFS) in EU fiscal monitoring ever more sophisticated, necessitating an unprecedented commitment by Eurostat to quality assurance and cross-country comparability⁽²⁾. This increased sophistication has also opened a process of establishing European Public Sector Accounting Standards (EPSAS), based on International Public Sector Accounting Standards (IPSAS) as a starting point, but modified and adapted to Europe⁽³⁾.

This paper is not meant to lead to immediate changes in the current national accounts: the SNA 2008/ESA 2010 have been just implemented! It expresses some long-term views in the domain of GFS and public sector accounting, focusing on a possible future convergence between the *macro* account-

ing standards (today presented in the framework of SNA/ESA) and the *micro* accounting standards (defined as public sector accounting standards applied to accounts of individual entities). The government, and in particular the central government, is the best candidate for this micro/macro convergence. Isn't central government the obvious case of an economic agent being at the same time a *micro* agent and a *macro* agent?

In this context, it is the (naïve?) belief of the author that, someday, a common accounting framework could be developed, applicable to micro government accounts as well as to macro government statistics (see Box 1)⁽⁴⁾. Compromises are necessary in order for the two systems to converge. Some necessitate a change of public sector accounting (perimeter of government, definition of balancing items, ...), some a change of GFS (control, provisions, ...).

The differences between the two systems have been for many years the on-going concern of the IPSAS board and the GFS community (see Milot (2012), IPSASB (2005), IPSASB (2012a), IPSASB (2012b), IPSASB (2012c), Dabbico (2013a), Dabbico (2013b))⁽⁵⁾. The contribution of this paper is that it discusses these problems in the context of the macro fiscal monitoring in Europe, which is quite unique. There is indeed no other group of countries where there is an agreement on specific quantitative indicators (‘Maastricht’ deficit and debt) enshrined in two international Treaties and, where the degree of comparability in fiscal data is as demanding.

⁽²⁾ See: https://webgate.ec.europa.eu/fpfis/mwikis/gfs/index.php/Main_Page

⁽³⁾ This paper does not consider the EPSAS project in any detail, but discusses the general interaction between national accounting and public accounting standards in the context of the EU.

⁽⁴⁾ In the rest of the paper, the term ‘GFS’ will refer to the SNA/ESA/EDP macro framework and their implementation manuals such as the Eurostat Manual on General Government Deficit and Debt (see Eurostat (2014)). The terms ‘public accounting’ or ‘public sector accounting’ will refer to the micro framework.

⁽⁵⁾ In Europe, it is the Excessive Deficit Procedure Working Group of Eurostat (EDPWG) which is the reference body for GFS.

BOX 1: 'STATISTICS' VERSUS 'ACCOUNTS'

At the centre of this paper is a discussion of the differences between GFS and public accounting standards. The simple fact that the former is called 'statistics' (the 'S' of GFS) and the other 'accounts' (the A of IPSAS) can be also discussed. The term 'statistics' is sometimes, at least in some people's minds, derogatory. On the contrary, 'accounts' has a positive sound. It sounds like 'accurate to the euro'. However, are we doing really 'statistics' in GFS in Europe and are 'accounts' really accurate to the euro? The response to both is: no. In European GFS, the data, at least in the October notification, are based on exhaustive sources, themselves based on public accounts. GFS is therefore quite far ahead of some other statistical domains, such as unemployment surveys or even the household accounts of the national accounts. The latter 'institutional sector' is only obtained indirectly, while the general government sector is based on direct and exhaustive sources, at least for 'final' data. Of course there remain some 'statistical' discrepancies between government non-financial accounts and financial accounts, or difficulties created by the very complex consolidation exercise that is necessary to derive consolidated data for the entire general government (one should keep in mind that there are tens of thousands of entities in the general government sector). But the numerous accountants working for complex multinational companies also encounter significant difficulties in consolidating the accounts of the group. These consolidated group accounts are far from being 'accurate to the euro'. But accountants would never accept being called 'statisticians', while they are doing something close to what GFS teams in National Statistical Institutes (NSIs) are doing. Overall, the right word to qualify 'GFS' would not be 'statistics' but 'macro-accounting'.

2. The special context of Europe as regards fiscal policy monitoring

The creation of the Euro currency came naturally with constraints on the fiscal policies of the Members of the currency area. These constraints were not sufficient and did not help to avoid the deep crisis that the Euro zone has experienced since 2009, but from which, hopefully, it is currently getting out. We will leave to economic historians to discuss what is the pure European responsibility in this crisis, and what is the relative importance of the fiscal imbalance relative to other imbalances (such as housing bubbles and/or loss of competitiveness). After all, the financial crisis started in the USA, not in Europe; and Spain and Ireland respected the European fiscal constraints. Nevertheless, these constraints have been reinforced after the crisis with the '6-pack' regulations, augmented by the '2 pack' for the Euro area. In addition, on the top of the 'Stability and Growth Pact' (SGP) of 1997, a new inter-governmental Treaty on Stability, Coordination and Governance (TSCG) entered into force on 1 January 2013. Overall, EU Member States have now to abide to a very complex set of rules based on indicators,

thresholds and sanctions. Only the future will tell if they are more efficient than the old ones. Nevertheless, from a statistical point of view, the originality of these indicators is that they are all based on GFS.

Everybody knows the two 'Maastricht criteria': public deficit should be lower than 3 % of GDP and general government debt lower than 60 %. Both are defined based on GFS. As a consequence GFS, NSIs and Eurostat have been propelled to the forefront of fiscal policy monitoring to the point that a renowned expert in national accounts said that, in Europe, national accounts can be 'summarised by GDP plus S13-B9', the latter being the code used by GFS experts to refer to the general government surplus/deficit ('*net lending/net borrowing*' in national accounts jargon). It is to be noted that the great importance given to 'S13-B9' is a European phenomenon, which is not reflected in non-EU OECD countries: while 'S13-B9' exists and is published in North America or Japan, it is not a headline indicator for policy makers at the national level. They

use their own national definition, generally directly derived from public sector accounting and not from national accounts.

However, things should not be overly simplified as regards the central role of GFS in EU fiscal monitoring. While the rules based on GFS indicators have indeed become more of a constraint, they have, on the other hand, also become more sophisticated. In particular, the so-called 'preventive arm' of the SGP is not directly based on 'S13-B9' but on the concept of 'structural deficit', which is defined as the 'cyclically adjusted deficit, net of one off and temporary measures'. This measure can be quite different from the pure 'S13-B9' ⁽⁶⁾. Also the TSCG is based on the structural deficit rather than on the 'pure' deficit:

'the budgetary position of the general government shall be balanced or in surplus, if the annual structural balance of the general government is at its country-specific medium-term objective, as defined in the revised SGP, with a lower limit of structural deficit of 0.5 % of GDP' ⁽⁷⁾.

The more economically relevant 'structural deficit' will be more widely used as the real target for

European fiscal policy. Technically speaking, this partly moves the responsibility of compiling the fiscal target from statisticians/accountants (NSIs and Eurostat) toward economists (National Treasuries and DG ECFIN). Indeed, the cyclical adjustment is traditionally done by economists, who, also, have the exclusive responsibility of defining what a 'one-off' measure is.

Nevertheless, the pure deficit, 'S13-B9', remains in use in the so-called 'corrective arm' of the SGP and the opening of a formal Excessive Deficit Procedure (EDP) remains linked to it. Also, S13-B9 remains the starting point for the calculation of the structural deficit. More importantly, the GFS concept of 'general government' is the cornerstone of the definition of all fiscal targets in the EU. The US Department of Commerce has qualified GDP as 'one of the greatest inventions of the 20th century'. In the context of European fiscal monitoring it would be fair to say that 'general government' is the second greatest invention!

3. The three essential definitions for public sector accounting standards in Europe

There are three complementary concepts/definitions that are essential to EU fiscal monitoring, and therefore would, by necessity, have to be taken into account when examining a possible converged micro/macro framework: (1) the concept of 'general government', as explained above; (2) the concept of gross, when measuring of debt; (3) the definition of surplus/deficit corresponding to SNA/ESA (S13-B9). They are essential because they are simply carved in the stone of two Treaties (SGP and TSCG) and it is extremely difficult to change a Treaty. Also,

there may be good economic reasons for the choices that were made in the Treaties. In any case, if public accounting standards are to be relevant for macro fiscal monitoring in Europe, they will have to adapt to these three major concepts/definitions ⁽⁸⁾:

- *General government:* The definition of the 'perimeter' of the government, also called the 'consolidation issue', is the primary issue for convergence and it therefore comes first in the technical discussion further down this paper.

⁽⁶⁾ One extreme example of this difference is Ireland for 2010. The 'pure' S13-B9 was - 32.4 %. The structural deficit was - 10.0 %! The enormous difference of 22.4 percentage points between the two was due for 20 p.p to the correction of 'one off and temporary measures' (the capital injection into failing Irish banks), and only 2.4 p.p for the cyclical component.

⁽⁷⁾ Emphasis added by the author.

⁽⁸⁾ There is a fourth essential concept/definition: the principle of accrual accounting. However, it is a principle that is fully common to GFS and public accounting (even if there are differences in its practical interpretation, see section 11). This is why we have not retained it here.

- *Gross debt*: *Gross debt* is the central target measure for debt in the EU and the term ‘gross’ is in the Protocol of the SGP. Accountants, whether private, public or national, would rather spontaneously propose a *net* debt concept. But, in the context of this paper which discusses the convergence of GFS and public accounting, the fact to use a gross concept or a net concept for debt is not really an issue. The gross concept is present in the standard financial statements of both systems and it is thus easy to obtain it without changing anything else in both systems. If *gross* is the policy makers’ preference, it is their responsibility (and they may have good reasons for it). In any case, both public sector accounting and GFS can easily deliver gross data. This is why this issue will not be discussed further in this paper.
- *Surplus/Deficit* (synonyms: *EDP surplus/deficit, net lending/net borrowing, S13-B9*): the wording of the Protocol to the SGP is clear: surplus/deficit is defined as the ‘*net borrowing as defined in the ESA*’. Thus the GFS definition prevails in the EU. Contrary to the concept of *gross*, the use of this specific balancing item as a target is problematic for convergence between GFS and public sector accounting. Indeed, despite the fact that there is a balancing item with exactly the same name in public accounting (*surplus/deficit*, also called *statement of financial performance*), it does not correspond to the concept of *net lending/net borrowing* of the ESA. In the GFS sequence of accounts, net borrowing is a balancing item which comes *after* non-financial investment, but *before* financial investment. The public sector accounting concept for measuring performance does not have this asymmetry between non-financial and financial investment (it intervenes *before* both non-financial and financial investments while, on the other hand, it includes depreciation). The other big difference is that the public accounting variable includes some holding gains/losses, while its GFS counterpart voluntarily excludes these. This item will therefore be one of the most discussed issues of this paper.

At this stage, we have pointed to two major issues for convergence: the perimeter of the government, which will be discussed in section 4, and the definition of the target surplus/deficit, which will be discussed in section 5.

While not as central as the two discussed previously, there are unfortunately many other sources of non-convergence between the two systems. They appear in the list below which is inspired by the several studies conducted on this issue (see IPSASB (2005), IPSASB (2012a), IPSASB (2012b), IPSASB (2012c), Dabbico (2013a), Dabbico (2013b)):

- Valuation of assets/liabilities
- Provisions
- Pension provisions
- Revisions, retroactive application of changes, correction of errors
- Accrual of taxes
- Detail of timing of accrual expenditure (e.g. timing of military expenditure)
- Treatment of Service concessions and Public Private Partnerships (PPPs)
- Super-dividends
- Research and development and software
- Chart of accounts and detailed classifications
- Timeliness and frequency of reporting (quarterly accounts)

These items will be discussed in the sections 6 to 12.

4. Consolidation: the ‘perimeter’ of government and the concept of control

The issue of ‘to which extent public entities are to be consolidated?’ is generally seen as the largest conceptual difference between GFS and public sector accounting ⁽⁹⁾ as the internal logic of the two systems leads to very different consolidation ‘perimeters’. It is the most important item which public accounting standards in Europe would have to address, when moving from individual entity accounts (*micro* level) to a consolidated view of ‘government’ (*macro* level). While this consolidated concept (sometimes referred to as ‘whole of government’) is addressed by IPSAS 22 (see IPSASB (2011)), in practice, most public sector accounting standards do not require the presentation of such a globally consolidated account, but rather focus on accounts

of individual entities (each set of accounts consolidating the bodies controlled by that entity) ⁽¹⁰⁾.

In order to develop a set of relevant financial statements respecting the Treaty constraints for macro fiscal monitoring in the EU, public accountants would have to work on developing such globally consolidated government accounts, strictly based on the ESA concept of *general government*. As is shown below, this is not technically difficult. It only needs public accounting standard setters to accept the principle of it, avoid imposing any rule obstructing this adaptation, and ask preparers to closely coordinate with NSIs to implement this concept in practice.

BOX 2: DEFINITION OF ‘GENERAL GOVERNMENT’

General government in GFS is fundamentally composed of a collection of units, the accounts of the general government being the result of the consolidation of the accounts of these units. Using a definition based on functionality, general government is composed of the consolidation of ‘institutional units’ having two principal functions: (1) to assume responsibility for ensuring the provision of goods and services to the community or to individual households, financing these provisions principally out of taxation; (2) and to assume responsibility for redistributing income and wealth by means of transfers. Moving from this theoretical definition to a simple pragmatic list of units, general government is composed of: (1) the administrations of government at every level of the organisation of a country (central, regional, and local), and, (2), other institutional units which carry out functions of government under the control of the entities under (1). These two categories encompass the central Budget, extra-budgetary units, all regional and local governments, social security funds, plus, marginally, a number of agencies/public corporations controlled by these government entities and having specific ‘non market’ characteristics. The consolidation of the accounts of all the entities of this list constitutes the accounts of the general government. Such a list is available in all EU Member States. It is closely monitored by NSIs and Eurostat.

4.1. The concept of general government

Despite years of debate, there is still a major difference of approach between GFS and public sector accounting as regards the ‘perimeter’ of the con-

solidation of public entities’ accounts. On one side, GFS has (very successfully) marketed the concept of ‘general government’ (see Box 2) to the extent that, as mentioned earlier, the concept is included in two EU Treaties. On the other side, public sector accounting methods of consolidation do not allow spontaneously to consolidate accounts under this perimeter (see Box 3).

⁽⁹⁾ The present paper will frequently use the term ‘consolidation’. GFS generally prefers the term ‘aggregation’. ‘Consolidation’ means, in accounting jargon, the netting out of all flows and stocks between the consolidated entities. GFS does not generally consolidate all the flows and stocks, contrary to public accounting. However, the GFS balancing items (such as surplus/deficit) are, by definition, consolidated. Also the Maastricht debt is consolidated. Therefore the two main indicators of the SGP are consolidated. Thus this difference between ‘aggregation’ and ‘consolidation’ is a minor issue in the context of this paper.

⁽¹⁰⁾ The IPSAS Board is currently reviewing IPSAS 22.

BOX 3: CONSOLIDATION IN PUBLIC SECTOR ACCOUNTING

The approach of public sector accounting for consolidation is different from GFS. Public sector accountants do not see themselves as consolidating the accounts of a pre-defined list of units. Public sector accountants see themselves as building the accounts of a 'reporting' entity (e.g. a given government, for example a regional government) and consolidating in its account the accounts of all units that are 'controlled' by this reporting entity. The concept of control is fundamental in this consolidation process. In public sector accounting, a government controls an entity if: (1) it benefits from it, and, (2), if it has the power to govern the financial and operating policies of the entity. In this sense, public sector accountants do not consolidate governments that have no control relation one over the other. For example, a state (Bundesland) would not be consolidated with the Federal government of Germany, as the former is not controlled by the latter. Conversely, all entities controlled by a reporting government entity are entirely consolidated with the latter. Thus, for example, all public corporations controlled by a state are to be consolidated within the state's account.

Behind this lie, first, a difference in approach and, second, the issue of whether the monitoring of government policies is to be based on the limited perimeter of the general government or be extended to the entire 'public sector', which is the general government *plus* public corporations controlled by the general government (see Box 4).

BOX 4: WHY NOT THE 'PUBLIC SECTOR'?

GFS excludes from its consolidation many public corporations despite the fact that they are controlled by a government entity. This may be seen as illogical, as government controls directly or indirectly their deficit and debt. Why is that? In national accounts, all corporations that are 'market oriented' are classified in the sector of corporations, whatever their status: private or public. In other terms, national accounts give more importance to the behaviour of the corporation than to its controlling entity. Even if a corporation is controlled by the government, as long as its operations are financed mostly through market activities, its economic behaviour may be much closer to the behaviour of private corporations than of government entities. This is why GFS classifies these public corporations outside of the general government sector. It classifies public corporations inside the general government sector only when the price at which they sell their product is obviously 'non-market' oriented (i.e. that their behaviour is very different from market oriented companies) ⁽¹⁾

However, technically, it is possible under GFS to consolidate all the government controlled public corporations. In fact some Member States publish such global consolidations. It has even a name in ESA/SNA: it is called the 'public sector'. But there are at least two important reasons justifying the choice to not use this concept in fiscal monitoring in Europe. First, the central objective of the SGP is the sustainability of government debt. It would not be efficient to include in the scope of the target public companies that can sustain their debt by themselves. Only those that cannot sustain their debt by themselves and thus structurally need government support should be included in the target (this justifies the low level of the 50 % test). Second, to include all public corporations (and in particular publicly controlled banks!) would lead to add enormous amounts of liabilities potentially obscuring the core debt of the government. Systematic inclusion of all public corporations within the perimeter of the general government would need to move from a target of gross debt to a target of net debt, which is certainly preferred by accountants, but more difficult to interpret, and thus, not preferred by policy makers. In any case, moving to 'public sector' would need a change in the EU SGP Treaty.

⁽¹⁾ In practice, only government controlled public corporations whose selling prices do not cover half of their production costs are reclassified within the general government sector. This is often referred to as the '50 % test'.

There are two main differences between the two approaches. On one hand, in public sector accounting, the perimeter of government is smaller (and more fragmented) compared to the GFS, which does not hesitate to consolidate all ‘governments’, whether one controls the other or not. On the other hand, the public sector accounting consolidation can be larger than the GFS consolidation because it consolidates all units controlled by a given government, including all public corporations that are controlled by it. GFS consolidates those public corporations that are controlled by a government only if these corporations are ‘non-market’. This leaves many publicly controlled corporations outside the perimeter of general government.

The debate between the two approaches has been resolved, in Europe, by policy makers. They have decided that macro monitoring of fiscal policy will be made using indicators derived from the accounts of the *general government*, based on GFS definitions. This is engraved in the stone of the EU SGP Treaty, and more than a dozen EU Regulations refer to it explicitly. All EU fiscal policy indicators are based on it. Thus, at this stage in Europe, one could consider it irrelevant to continue to discuss the advantages and disadvantages of one approach compared to the other.

In essence, the underlying assumption of the SGP, of the EU Excessive Deficit Procedure (EDP) and all the many attached Regulations, is that the central government need to ‘control’ *de facto* the other levels of government in terms of fiscal targeting. This could be illustrated for example for Spain. As for other countries, the Commission has set a global target for the deficit of the general government. Because of having the responsibility of respecting this global target, the central government has itself set a system obliging the ‘autonomous’ regions to respect a certain deficit target. Without these regional targets, the central level would not be able to abide by the global target set by the Commission for the general government of Spain. In this context, the issue of whether the central government of Spain ‘controls’ or not, in terms of public sector accounting, the ‘autonomous regions’ becomes irrelevant for policy making at EU level.

Thus, if public sector accounting standards are to be relevant for macro fiscal policy in Europe, it is necessary that they pragmatically allow for the consolidation of all units that are classified by GFS as part of the general government sector. Conceptually speaking, this does not even need to change the public sector accounting standards. It needs simply for them to accept the principle of this different consolidation and closely coordinate with NSIs. Public accountants should simply be aware of the list of entities included in the general government by NSIs and prepare their accounts respecting the constraint of its consolidation, consolidating all entities of this list and avoiding consolidating entities that are not in this list. Thus an ideological debate would be resolved in a pragmatic way!

4.2. The concept of control

While the concept of general government should be a compromise accepted by public accounting standards, the GFS concept of control could be fruitfully totally aligned on the public sector accounting one.

The concept of control in GFS remained quite general within the old SNA 93/ESA 95. It was simply summarised by the ‘ability for the controlling unit to determine the general policy of the controlled unit’. The definition of control has been made more precise in the SNA 2008/ESA 2010, and one can now say that GFS and public accounting are nearly completely in line. In this context, the author proposes that the GFS makes the final step towards convergence and completely aligns itself to the public accounting approach of control, which is in fact well adapted to the use made in GFS. This would eliminate a small but annoying and artificial difference between the two systems.

Control in public accounting is based on two main criteria: (1) does the entity benefit from the activities of the other entity? and (2) does the entity have the power to govern the financial and operating policies of the other entity? In public accounting, the power element does not mean that an entity absolutely needs to hold a majority shareholding in the entity in order to control it. Already sufficient

would be the power to remove a majority of the members of the board of directors.

In the delicate context of special purpose entities (SPEs), control may, under public sector accounting, arise through the predetermination of the activities of the SPE, or if, in substance, the activities of the SPE are being conducted on behalf of the controlling entity according to its specific needs so that the controlling entity obtains benefits from the SPE. In this context, the financing of one entity by another entity might be a criterion for the control of the former by the latter.

All these conditions are extremely close to those developed in the SNA 2008/ESA 2010. There should be therefore no difficulty for the GFS to completely align on the public accounting definitions of control, for example the IPSAS one.

4.3. Would all problems pertaining to the perimeter of consolidation be resolved?

Overall, while the issue of the perimeter of government was considered to be the most problematic difference between GFS and public sector accounting, the author is convinced that a pragmatic convergence is possible. The question remains: will this resolve all borderline cases? As for all accounting systems, there is an important gap between the principles, and their practical implementation. This is why, besides an accounting 'board' which discusses principles, all efficient standard setting systems have an 'interpretation committee' in order to bridge theory and practice. Borderline cases would be discussed by this type of interpretation committee.

One particularly interesting borderline case to be submitted to such an interpretation committee is the situation of 'multiple control'. Let's imagine a

public water treatment company offering water services to inhabitants of several municipalities, each municipality having an equal share of the company. Let's imagine that the company is 'non-market' (using the GFS terms), in the sense that households do not pay for water consumption but that the company is financed through subsidies paid by the municipalities, themselves financed by tax. Would this company be inside the general government perimeter?

Under GFS, the answer is definitively yes. The company would be considered as being part of the general government sector because it is controlled exclusively by general government units *and* is non-market. Under current public sector accounting rules, the answer is unclear. This company would be consolidated within none of the municipalities, as none of them has a determining control on the company. Finally, it is not clear whether proportional consolidation would be recommended. This is an illustration of the difference between the approach of GFS and public sector accounting as regards the basic principle of consolidation. The objective of public sector accounting is to compile the consolidated accounts of one single reporting entity. The objective of GFS is to compile the consolidated accounts of a global macro sector, the general government, which regroups many entities having the same economic behaviour. In this regard, in GFS thinking, the fact that no single municipality controls the water company does not preclude the company being consolidated inside the general government sector. How would each municipality's account reflect this 'partial control' under GFS? By 'proportional consolidation': the transactions and balance sheet of the company would be fragmented by municipality, probably based on each one's share of ownership. As a matter of fact, the recent treatment of the European Financial Stability Fund (EFSF) has followed the same rationale (see Box 5).

BOX 5: THE CASE OF EFSF

EFSF was a transitory entity (now replaced by ESM) which organised the financial rescue of Greece, Portugal and Ireland. Formally, EFSF is a Luxembourg financial corporation, owned collectively by Euro area governments, with none of them having majority control. Going beyond this formality, Eurostat considered that EFSF was only an accounting and treasury tool used collectively by Euro area governments in order to access financial markets with the same conditions and forward the financing to other members of the Euro area. In particular, EFSF can only function because its borrowing on the markets received the collective guarantee of Euro area governments. This was the only reason EFSF successfully achieved in borrowing and lending around 176 Bn euros while having a capital of 300 Mn ⁽¹²⁾! Therefore Eurostat decided that, under GFS, EFSF was to be 'cut' into pieces, each one attributed to each of the Euro area governments, in proportion to the level of guarantee for each loan transaction. Thus each time EFSF borrowed, it increased the Maastricht debt of the guarantors. Such a treatment would not have been possible in current public sector accounting standards, because of their rules on 'control'. As none of the EU government had, on its own, control of the company, EFSF could be consolidated within the accounts of none! This example illustrates the necessity for the rules of consolidation in public accounting to adapt to the case of control by multiple government entities.

5. Definition of surplus/deficit

In section 2, we explained that the GFS definition of *surplus/deficit* is, on the one hand, carved in the stone of the EU Treaties, and, on the other hand, significantly different from its corresponding public accounting concept, despite their similar name. This section discusses this difference and the way to overcome it, keeping in mind that, as explained above, the definitions adopted in the Treaties cannot be changed. It appears that, overall, there is no insurmountable difficulty for public accountants who would simply have to create an additional balancing item. However, there may be need of a common reflection between the experts of the two systems to obtain full convergence as regards the impact of holding gains/losses in the measure of surplus/deficit.

5.1. Differences in the treatment of capital expenditures

GFS 'surplus/deficit' (i.e. 'net lending/borrowing' or 'S13-B9') is the difference between revenues and expenditures, themselves taking into account current *and* capital expenditures (and not taking into account depreciation). It is meant to measure whether the government will need to borrow more (or run

down its financial assets) to conduct all its operations, including its capital expenditures.

Public accounting 'surplus/deficit' is equal to the difference between revenues and expenditures, where expenditures are limited to *current* expenditures, taking into account depreciation, but not taking into account *capital* expenditures. As illustrated by the title of the account of which it is the balancing item ('Statement of Financial Performance'), the objective is to measure the current financial 'performance' of the year. It corresponds to the classical 'profit and loss' balancing item of the private sector ⁽¹³⁾.

Some may consider that this public account definition is better than the GFS one. Indeed, the GFS definition treats asymmetrically non-financial assets and financial assets. For example, if a government sells a building, this reduces its GFS deficit. If the government sells shares in a real estate company which owns this same building, this does not reduce its GFS deficit. This may seem awkward. In public sector accounting, this asymmetry does not exist and the public accounting surplus/deficit is an indicator perfectly suited to measure the respect

⁽¹²⁾ A leverage ratio of 587!

⁽¹³⁾ Only the wording has been changed, probably because the term 'profit' does not 'sound' well in the context of the public sector.

of the so-called ‘golden rule’ (*current* expenditures must be financed by *current* revenues).

In fact, there is a (less well known) balancing item in GFS which corresponds exactly to the definition of the ‘surplus/deficit’ of public sector accounting. It is called ‘net savings’ (‘S13-B8N’). It could therefore also be used to monitor the golden rule⁽¹⁴⁾. Similarly to the surplus/deficit of public sector accounting, it takes into account *current* revenues and expenditures, including depreciation⁽¹⁵⁾, and excludes capital expenditures. So there is, on a technical basis, a possibility of convergence.

But policy makers in the EU have chosen ‘S13-B9’ rather than ‘S13-B8N’ to be the main indicator of the SGP. It is not fully clear why this choice was made, and, in fact, the indicator chosen on the SGP is regularly criticised as being a disincentive for governments to invest in non-financial assets, while they may be productive for the future. Given that the rationale is never provided, one is forced to make assumptions as to why this choice was made. Maybe it was because net lending/borrowing is closer to the traditional definition of surplus/deficit in cash budget accounting? Or, more pragmatically, because the only concern of policy makers is whether or not the government will need to borrow? Or is it because EU policy makers do not consider non-financial assets of government as ‘real’ assets, because they are neither ‘productive’ nor ‘sellable’? Or is it because the measurement of the depreciation of government non-financial assets is considered unreliable? Or is it because, more broadly, EU policy makers do not believe in a measure of performance for the public sector based on a private sector approach?

On the other hand, it is to be noted, much more pragmatically, that the choice of a balancing item such as S13-B9, which intervenes *after* capital expenditures and not *before*, has the advantage over S13-B8N of avoiding the inevitable difficult debate

of what is a *current* expenditure versus a *capital* expenditure. In fact, there have been several attempts by Member States in the last decade to propose the exclusion of capital expenditures from the measure of the EDP deficit. Some even argued that expenditure in education is capital (it creates human capital!). This line of thinking was opposed by the European Commission. Finally, one can note that, in a recent paper presented in an important economic committee in the OECD (see OECD 2015), S13-B9 was considered as the best tool, associated to an expenditure target, for establishing a sound and practical target for maintaining sustainable public debt.

Whatever the reason and even if one considers that the concept of surplus/deficit of public sector accounting is a better one, there is hardly any chance of amending the reference to S13-B9 as it is in the EU Treaty. Thus, similarly as in the case of the definition of general government, it would be up to public accounting to adapt as, today, there is no exactly corresponding balancing item in public sector accounting⁽¹⁶⁾. But this is not difficult. It does not even need to modify the current definition of surplus/deficit in public sector accounting. It needs to add a new balancing item corresponding to S13-B9 in the sequence of accounts.

5.2. Differences in the treatment of holding gains/losses

Unfortunately, the issue would not be completely closed by this simple addition because of the differing approaches as regards the inclusion or not of holding gains/losses (i.e. revaluations) in the surplus/deficit. Public accounting includes some impacts of holding gains/losses while GFS excludes it totally. This difference is not only between GFS and public sector accounting, but more generally between national accounts globally (whatever the sector) and accounting globally (whether private or public). National accounts constitute a system in which the measure of ‘production’ (a concept that does not exist in accounting, whether private or public) is supposed to match the measure of income and the measure of final demand. This is il-

⁽¹⁴⁾ It would also have the advantage, compared to S13-B9, of being closer to the concept of structural deficit, in the sense that it is not affected by exceptional expenditures or revenues (i.e. the so-called ‘capital transfers’ in GFS).

⁽¹⁵⁾ We do not discuss here that depreciation in GFS (called Consumption of Fixed Capital – CFC) is quite different in practice from its counterpart in public sector accounting standards, as CFC is based on replacement value, while depreciation is usually based on historic value.

⁽¹⁶⁾ The closest, but not equivalent, would be the balancing item of the Cash Flow Statement of the IPSAS. However, it is a cash figure and not an accrual one.

illustrated by the well-known equality between the ‘three approaches’ to GDP. In this context, the treatment of holding gains/losses in national accounts is constrained by its measure of production (i.e. ‘GDP output’). Since holding gains/losses, whether realised or not, cannot be considered economically as the result of a production process (they result from effects outside the reach of producers⁽¹⁷⁾, they are thus excluded from the measure of global output (‘GDP output approach’) thus, by extension, from the measure of global income (‘GDP income’). This principle extends to all sectors and balancing items of the national accounts, in particular, to S13-B9 (and also S13-B8N).

Some consider this exclusion as inappropriate, in particular when holding gains/losses are not only potential but ‘realised’. For example, it may look strange that the surplus/deficit is not affected by the realisation of a holding gain on the sale of shares by the government⁽¹⁸⁾. After all, this is an additional cash obtained which is as ‘real’ as cash received from tax! Others, on the contrary, may consider this exclusion as an advantage, as including holding gains/losses in S13-B9 would reduce its quality as a target for active fiscal policy, because realising holding gains are outside the direct reach of fiscal policy makers and look more like an opportunistic windfall.

The approach of public sector accounting is more open to include holding gains/losses inside its measure of performance. In particular, *realised* gains and losses are systematically included in it.

In public sector accounting, revenue and expense are defined as the result of changes in assets and liabilities. Revenue is defined as:

‘the gross inflow of economic benefits or service potential during the reporting period when those in-

⁽¹⁷⁾ Some have questioned this in the context of units whose sole activity is the buying and selling of assets, and where most of their ‘income’ arises from holding gains. In such cases it can often be observed that value-added as measured in the national accounts is negative, and therefore there has been an observed habit amongst some national accountants of estimating the production of such units as the sum of their costs.

⁽¹⁸⁾ As an aside, there is an interesting question here about the treatment of dividends. A government may wait to receive dividends before selling its shares, or sell (presumably at a higher price) just before a dividend distribution. Since dividends are treated as deficit-impacting revenues, there is a potential impact on the deficit/surplus of the implicit holding gains depending on the timing of the sale of shares.

flows result in an increase in net assets/equity’.

Expenses are defined as:

‘decreases in economic benefits or service potential during the reporting period in the form of outflows or consumption of assets or incurrence of liabilities that result in decreases in net assets/equity’.

With these definitions, and when considering that assets/liabilities will most probably not have their original price when *transacted* upon (i.e. realised), realised holding gains/losses on assets will systematically be recorded as part of revenues and/or expenses, with (contrary to GFS) a substantial impact on the public accounting surplus/deficit.

However, the same is not true for *unrealised* holding gains/losses. First, the unrealised holding gains and losses occurring on financial instruments classified as ‘available for sale’ are, similarly to national accounts, directly recognised in the balance sheet and not in the revenue/expense accounts. Second, because, contrary to national accounts, public accounting standards are quite conservative as regards the valuation of assets and liabilities.

Indeed, on the asset side of the balance sheet, non-financial assets are mostly valued at historic costs (less provision for depreciation). Also, financial assets such as deposits, loans, and securities meant to be kept until maturity are valued at historic costs, except for provision for impairment. As for liabilities, similarly to the practice followed in the Maastricht definition of debt, the valuation of deposits, securities and loans issued by government is, in public sector accounting, based on nominal value. The only exception is derivatives which is systematically valued at market value⁽¹⁹⁾.

Thus, the impact that unrealised holding gains/losses have on the public account surplus/deficit is essentially limited to impairments of assets when their fair value begins to be lower than their carrying value (usually equivalent to historic cost less depreciation). While, in some cases, a reporting entity may elect to use ‘the revaluation model’ (where assets are revalued systematically upwards), this upward impact does not impact surplus/defi-

⁽¹⁹⁾ But derivatives are not part of the Maastricht debt nor intervene any more in the Maastricht definition of surplus/deficit.

cit but is added to a revaluation ‘surplus’ (reserve). The revaluation reserve can then be called on if the value of the same class of asset is subsequently revised downwards, thereby excluding the downward impact on the entity’s surplus/deficit up to the value of the reserve ⁽²⁰⁾. Overall, it is only when an asset is sold that realised gains can have an impact on the statement of financial performance. Under this first analysis, it seems that the impact in public sector accounting of changes in valuation on the surplus/deficit of government is less prevalent than initially thought for *unrealised* holding gains/losses.

On the other hand, the issue of *realised* holding gains, which are included by the public sector accounting standards in surplus/deficit but excluded by GFS remains. Is this a case where GFS could per-

haps align on public sector accounting? It is indeed perfectly possible to imagine keeping unchanged the production boundary (GDP) in the national accounts while building an income boundary differing from it by the inclusion of realised holding gains/losses. The so-called ‘equality of the three approaches to GDP’ is not carved in the stone of the system, but is simply a technical shortcut.

Already, the concept of GNI is increasingly used as a better concept than GDP when measuring the global revenue of a country. One could imagine the introduction in the SNA/ESA sequence of accounts of a line ‘realised holding gains/losses’ that could come just before the calculation of disposable income (and thus, further down, affect the calculation of S13-B9) ⁽²¹⁾.

6. Valuation of assets and liabilities

The differing approaches as regards the valuation of assets and liabilities are often presented as a major obstacle for convergence between the two systems. Indeed, on one side, GFS is based on the principle of valuing, in general, assets and all liabilities at ‘market price’. On the other side, despite a move towards fair value accounting, public accounting remains more prone to value balance sheet elements at historic cost, as explained in the previous section. The special case of concessionary loans is discussed in Box 6.

However, once more, one should not overestimate the importance of this difference in practice. First, on the liability side, the debt indicator used in the fiscal monitoring in Europe is not taken directly from GFS. The really important indicator in the EU

is the Maastricht definition of government debt, which is at nominal value and not at ‘market price’ ⁽²²⁾! Therefore, EU GFS and public sector accounts therefore already converge *de facto* on this point. On the contrary, it is true that, on the asset side, GFS values non-financial assets at ‘market price’ while public accounting prefers the use of historic costs. But, once again, one should not overestimate the importance of this difference in practice: indeed, there is no balance sheet indicator in EU fiscal monitoring which is based on assets! As seen earlier, the exclusive balance sheet indicator is *gross* debt, not *net* debt. So the valuation of government assets has no real importance in practice.

Overall, convergence in this field needs only presentational changes. GFS should continue to publish debt at nominal value and reserve its measure of debt at ‘market value’ for ‘off balance sheet’ information ⁽²³⁾. As regards assets, GFS can continue its current measure at market price while public sector accounts could include a valuation of assets at ‘market price’ as an information item in the notes.

⁽²⁰⁾ See IPSAS 17 (see IPSASB (2011)) for further detail on the ‘revaluation model’; the approach is mirrored in other IPSASs dealing with valuation of assets.

⁽²¹⁾ In fact such a proposal was already made, in particular in the end of the 90s, during the new economy bubble. Indeed, some economists questioned the fact that, while taxes on holding gains are subtracted from disposable income, the tax base (realised holding gains) is not included in it, thus artificially lowering the saving ratio! However, the proposal was rejected because of the sort of fascination by national accountants on the symmetry of their tables. Indeed, if holding gains/losses are included in disposable income, this item will become asymmetrical, as a holding gain (respectively loss) of one agent is not a holding loss (resp. gain) of another agent.

⁽²²⁾ To be exact, Maastricht debt is recorded at ‘face value’. The difference between nominal value and face value is limited to zero-coupon bonds and to unpaid accrued interest.

⁽²³⁾ This is already the case in EDP notifications and in the ‘Public sector debt’ published by the IMF.

BOX 6: CONCESSIONARY LOANS

The case of concessionary loans is very specific in the sense that the situation is reversed compared to the general case: for concessionary loans, GFS recommends a valuation at nominal value, while public sector accounting seems to recommend a valuation at 'market price' (i.e. at net present value). To understand this point, one needs to be precise on the rules for valuation of debt in the SNA. The SNA does not recommend valuation at market price when there is no market! It recommends valuation at 'market value' exclusively for tradable debt. As a result, loans (including concessionary loans) are to be recorded at nominal value ⁽²⁴⁾. On the other hand, IPSAS seems to be open to a systematic valuation of concessionary loans at net present value (which is a form of market price).

This issue is not a theoretical one. It has been raised recently about the Greek public debt. There has been a side discussion in late 2014 that the Greek debt was in reality much lower than as measured by the Maastricht debt (175 % of GDP). This idea was based on the calculation of the Greek debt at net present value, using the high interest rate on Greek bonds on the secondary market as the discount factor. If one can understand the use of such a valuation for the tradable bonds issued by the Greek government (which have indeed, on the secondary market, a market value under their face value due to the risk premium assigned to Greece in the financial markets), it is wrong to extend this type of calculation to the bulk of the Greek debt which is detained by EU governments and the ECB in the form of loans. These loans are not tradable. They are bilateral or multilateral loans that are not exchanged in the markets. To calculate a net present value for these loans is, in the view of the author, absurd at least for two reasons: (1) the creditors (the EU governments) have strictly no intention to sell these 'assets'; (2) to use the market interest rate on tradable bonds as the discount factor in the calculation of the net present value of these non-tradable loans is akin to implicitly recognise that Greece will default on them! This is of course not the official view of the creditors...at least at the moment this paper is finalised. This discussion extends to the general valuation of debt instruments. Is it reasonable to calculate debt at net present value for a country confronted to big risk premiums when this has the very strange consequence that the closer to default, the more the debt disappears in the statistics? Valuing debt instruments at nominal value seems much more reasonable, in particular on the liability side!

7. Provisions, capital transfers and guarantees

The case of 'provisions' is one for which the author is convinced that it is clearly up to GFS to adapt to the approach of public accounting. Today the concept of 'Provisions' is not really recognised by the SNA. By including it in its scope, GFS methodology would gain in logic and solidity. Furthermore, no Treaty opposes the inclusion of 'provisions' in the scope of the GFS measure of surplus/deficit!

'Provisions' are an essential category in business or public sector accounting ⁽²⁵⁾. Despite a fledg-

⁽²⁴⁾ This treatment was confirmed by Eurostat as recently as 2013 (see Eurostat (2013b)). To be noted that there is an item in the research agenda of the SNA on this issue (see <http://unstats.un.org/unsd/nationalaccount/r/issue.asp?rID=9>, paragraphs A4.41 and A.4.43).

⁽²⁵⁾ Provisions are a category of liabilities. The discussion in this section can be extended to 'impairment of assets' (e.g. non-performing loans), which is a provision, but on the asset side.

ling debate during the preparation of the SNA 2008 (see Lequiller (2004), Vanoli (2004)), 'provisions' remain essentially unrecognised in GFS ⁽²⁶⁾. The only small step which was achieved during the process of the preparation of the SNA 2008 was to introduce this issue in the 'research agenda' of the future SNA. Better than nothing, but not sufficient in the view of the author!

This non recognition is going to be increasingly difficult to live with, as governments are moving progressively towards adopting accrual accounting principles, inspired from IFRS/IPSAS, in which the concept of 'provision' exists. Statisticians will there-

⁽²⁶⁾ Only some limited categories of provisions are recognised (insurance provisions, provisions for standardised guarantees).

fore be confronted by the question: what to do with the provisions recognised by the government entities ⁽²⁷⁾? Ignore them? But is it reasonable to ignore a recognition made by a government that it has a form of liability? Even if provisions are usually challenging to measure — often based on key assumptions — the auditors of financial statements have enough confidence in them to ‘sign off on them’.

In public sector accounting (as in business accounting) there are three degrees of obligations: liabilities, provisions and contingent liabilities. Their definitions are the following:

- a. A *liability* is a present obligation of the entity arising from past events, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits or service potential.
- b. A *provision* is a liability of uncertain timing or amount.
- c. A *contingent liability* is a possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity.

As can be seen in this definition, a provision is a *liability*. As such, it is to be recorded on balance sheet, contrary to a contingent liability, which is recorded off balance sheet. A provision is simply a liability of *uncertain* timing and amount. While the concept of provisions is not recognised as such in GFS, the ‘uncertainty’ and the ‘timing’ of some obligations are frequently discussed inside the GFS community in Europe. Statisticians are indeed regularly, and inevitably, confronted to have to answer to questions such as ‘when should a certain liability be recognised, and for which amount?’ This issue is closely linked to the timing of the recording of ‘capital transfers’ from/by government.

The author of this paper thinks that, faced with these questions, statisticians would gain by looking

into the response given by public sector accountants. The answer of accountants is ‘provisioning’.

Many statisticians still consider ‘provisions’ more or less as taboo, for two reasons. First, national accounts are supposed to be symmetrical by construction. A financial liability of one agent has to be an asset of another agent. Some national accountants go as far as saying that there is no necessity to have a national accounts definition of a ‘liability’. One simply needs a definition of financial assets, as, by construction, one economic agent’s financial asset automatically corresponds to a liability of another economic agent. However, this argumentation is not sustainable: the point of view of one agent on another agent can be different when looked at from the opposite direction. For example, banks may have non-performing loans which they need to provision (a better word in this case is ‘impair’) because they consider that they will not recover such loans. But this does not mean that the corresponding liabilities of debtors should be reduced. In other terms, it is not because I, as a bank, recognise now that I will probably lose part of the value of the loan that I made to you, that you, as my debtor, should be allowed to reduce your debt to me in your accounts. The symmetry argument of the GFS is a technical constraint that does not sustain economic analysis. There is therefore a need to go beyond this technical limitation and show the correct financial position of each agent, even if it is not ‘symmetrical’. There are means to do that without putting in question the famous principle of quadruple entry (see Box 7) ⁽²⁸⁾.

The second argument traditionally used by national accountants is that provisions are not reliable. Some go as far as saying that ‘provisioning’ paves the way to window dressing. While of course there can always be abuse, this argument is wrong: provisions are accounting categories that are defined and controlled by auditors, based on written recommendations and jurisprudence. It would need compelling justification for a statistician to reject the estimate of a provision after it has been certified by competent auditors.

⁽²⁷⁾ As an illustration of the importance of provisions, the accounts of the Central government for France for 2011 show an amount of 114 bn euros of provisions, to be compared with liabilities of 1 339 bn, thus not a major item, but still a significant one. These provisions do not include pensions.

⁽²⁸⁾ For the unconditional supporters of symmetry, one could envisage a memo item in the counterpart entity’s accounts. However, this would mean that there is an identifiable counterpart, which is not always the case for provisions.

BOX 7 : DOES THE RECOGNITION OF NON-SYMMETRICAL OPERATIONS FUNDAMENTALLY QUESTION THE NATIONAL ACCOUNTS FRAMEWORK?

The present paper proposes several changes to the GFS framework that could be seen by national accounts purists as putting in question the fundamental principle of national accounts known as the 'quadruple entry system'.

The national accounts framework has been extremely successful in good part because it is at the same time global and consistent. Like all accounting systems since the 16th century, the SNA is a double entry system (each transaction is recorded twice, in the non-financial accounts and in the financial accounts). But going beyond classical accounting systems, it is a quadruple entry system in the sense that, with the aim of being global, the SNA records transactions in the accounts of both parties. For example the payment of compensation by a firm to its employee is recorded four times: twice in the accounts of the employee, twice in the accounts of the firm. This is very valuable to users of national accounts data because this leads to a set of very consistent data, allows multiplying economic correlations in a consistent macro-economic setting and, finally, explains the success of the SNA with macro-economists.

However, this consistency should not preclude some flexibility in presentation. Indeed, as explained in the paper, it happens that relations between agents are not always 'transactions' and that the view of one agent on another agent may not be reversible. This is the case for 'provisions' as explained in the main text. It happens also in other specific cases such as, to give a famous example, licenses issued by government for a mobile phone spectrum. The recording of this special (and large in money terms) operation is well known by experts of national accounts to have given rise to several conflicting treatment proposals. The reason for this difficulty is that such a license is not viewed in the same way by the issuer (Government) and the buyer (Telephone Corporation). For the former, it is a tax. For the latter, it is an asset. The national accounts had to imagine a complicated and artificial recording system to respect its quadruple entry system in this non symmetrical case.

The objective of this paper is not to destroy the global consistency of the SNA framework. It simply promotes some flexibility in the system to avoid cases where the sequence of accounts of the SNA would not allow delivering the good message about the situation of one agent because of another agent. For example, it is not a good thing that one cannot reflect under the SNA the complete debt situation of an agent simply because the tables should be symmetrical. This is what happens when refusing to record a provision recognised by one agent simply because there is no counterpart to the provision in the accounts of another agent. The same would be true in refusing to accept that realised holding gains/losses are included in an alternative measure of surplus/deficit simply because it would not be symmetrical or it would go against the equality of GDP output and GDP income!

The author is sure that national accountants have sufficient imagination to develop additional lines, tables and/or memorandum items avoiding such rigidities. It can be done without putting in question the overall principle of quadruple entry. The reverse would lead users to move away from the SNA as the reference framework system for the macro-accounting of governments.

In public sector accounting provisions have three characteristics: (1) they are an estimate, (2) they affect surplus/deficit; (3) changing the estimate of a provision affects the surplus/deficit of the period of the change (and not the initial estimate). The following sections illustrate that the introduction of this concept and of its three characteristics would strengthen the rationale of GFS while not creating havoc in the system.

7.1. The introduction of provision in GFS is not a revolution for GFS...

First, provisions are liabilities of 'uncertain amount'. So by definition a provision is an 'estimate'. To quote public sector accounting:

'the amount recognised as a provision shall be the best estimate of the expenditure required to settle the

present obligation at the reporting date.'

Is this a problem for GFS? No, GFS is used to make estimates, in particular for the first publication of the accounts of year Y, in spring Y + 1.

Second, provisions are already, whether explicitly or implicitly, included in GFS. A good example of this is the case of guarantees. The SNA explicitly recommends recording a '**provision for calls under standardised guarantees**'⁽²⁹⁾, in particular when the government is itself recognising a provision in its own accounts. There is now even a special code in SNA for this provision: F66. Moreover, the section on guarantees of the Eurostat Manual on Government Deficit and Debt (MGDD, Eurostat (2014)) contains an explicit mention of 'provisions'. It is stated that a guarantee is to be changed into a debt assumption when '*a provision is recorded in public accounts that shows that the probability that government will repay the debt is very high*'. Finally, and even more interesting, the same MGDD section presents the rule of 'three guarantee calls' in the following way:

'as practical guidance, if government pays part of the guaranteed debt in three consecutive years, and this situation is expected to continue, then the whole of the guaranteed debt is to be considered assumed in its entirety.'

This resembles very much a practical and simple way of recording a 'guarantee provision'. Indeed, it could be translated into: after three consecutive calls, a 'provision' should be recognised and the best estimate at this stage of the provision is simply the rest of the remaining amount of the guarantee.

It is to be noted that the recognition of these (quasi-)provisions in GFS has a direct impact on net lending/borrowing, via a capital transfer (as debt assumptions impact net lending/borrowing). The resemblance with public sector accounting thus increases, as the recognition of a (quasi-)provision affects the headline figure of surplus/deficit in both systems.

The resemblance even increases further when, in certain cases, there is implicit recognition by the GFS that such a capital transfer can be reversed. In-

deed, the MGDD (see MGDD (2015), & VII.4.2.6) mentions that, when there has been previously a 'judgment' that government will repay the debt thus leading to a capital transfer, this capital transfer is to be 'reversed' if circumstances change and it appears that the first capital transfer has proven wrong. This is typically the mechanism of a provision.

7.2. ...but the present situation remains unsatisfactory, stopping at 'mid-stream', thus leading to a proposal to incorporate a full fledged concept of provision in GFS

However, while recognising these provisions implicitly, the GFS methodology does not openly recognise that the provision is asymmetric and does not mention that the 'capital transfer' relating to the provision is, in fact, not 'received' by the other party, and therefore is not a transaction as defined by the SNA. Indeed, it is not because the government has recognised a provision for standardised guarantees that each concerned individual receiving the guaranteed loans can record that it has received a capital transfer from the government. It is only a probabilistic future transaction. Thus it would be beneficial to fully clarify the special nature of this 'capital transfer'.

Also, GFS is not always clear on what happens if the anticipated estimate (e.g. the amount of estimated future assumed debt) is not confirmed in the future. In some cases, such as the one mentioned above (three calls), the guidelines allow for such a capital transfer to be reversed, but in other cases the issue is ignored. The proposal put on the table by the author is therefore the incorporation of a fully-fledged concept of provisions in GFS, including the three characteristics that they have in public sector accounting: (1) they should be recognised as soon as they are known with sufficient certainty (best estimate); (2) their recognition should impact net lending/borrowing of the entity recognising the provision, but not of the counterpart entity⁽³⁰⁾; (3) when the estimate needs to be changed, it should impact

⁽²⁹⁾ Emphasis added by the author.

⁽³⁰⁾ This needs the introduction of new 'non-symmetrical' entries in GFS (see example below).

the net lending/borrowing of the entity recognising the provision at the period of change (and not the original period).

Let us illustrate this proposal using an example based on the provision 'after three guarantee calls'. Let us suppose that government issues a guarantee on a liability of 1000 for a public company. In three consecutive years, the company partially calls the guarantee, each time for 100. Thus a traditional capital transfer (D9) of 100 is recorded for each of these years. However, in the third year, based on the 'three calls rule', a provision is passed for the entire amount of the remaining guarantee (700), anticipating that the whole amount will be called. Figure 1 reflect the accounts at the time of the provision is recognised (in the third year). Note that we have named the code of this provision as F67, a new code invented by the author.

As will be seen in this example, there is also need to create two new accounting entries, 'D9P' and 'B9P', which are not 'symmetrical' as they are only recorded in the government accounts (and not in the accounts of the public corporation). Similarly to F67, the codes D9P and B9P are invented by the author in the context of this paper (they cannot be found in SNA and ESA). In this new presentation, B9P is equal to the traditional B9 *plus* the special (non-symmetrical) 'capital transfer' D9P. In other words, the change in provisions for guarantees to be called is incorporated in a new definition of surplus/deficit. This does not mean forcibly that we would exclude the impact of provisions from the headline GFS surplus/deficit, as B9P could replace B9 as the reference concept for the GFS surplus/deficit (respectively B9Pf and B9f in the financial accounts).

Figure 1: Example of T-accounts for a 'third call' provision — year of the third call

Government		Public corporation		
Third call:				
D9	100	D9	100	
Provision:				
D9P	700			
B9	- 100	B9	+ 100	
B9P	- 800			
<hr/>		<hr/>		
	F67	+ 700	F4	- 100
	F4	+ 100		
	B9f	- 100	B9f	+ 100
	B9Pf	- 800		

What will happen in subsequent years? Imagine first that a fourth call intervenes in the next year. A capital transfer is to be recorded as:

Figure 2: Example of T-accounts for a ‘third call’ provision — year of the fourth call

Government		Public corporation		
Fourth call:				
D9	100	D9	100	
Provision:				
D9P	- 100			
B9	- 100	B9	+ 100	
B9P	0			
<hr/>		<hr/>		
	F4	+ 100	F4	- 100
	F67	- 100		
	B9f	100	B9	+ 100
	B9Pf	0		

As can be seen, the new concept of deficit B9P is not impacted by the fourth call. This is logical, as the value of the provision is decreased in parallel to the fourth call. Imagine now that in the next period, it appears that the provision was totally wrong and

that, in the end, the company has reimbursed the remaining of its liability without having the need to call for the remaining of the guarantee. The recording as in Figure 3 would be introduced:

Figure 3: Example of T-accounts for a ‘third call’ provision — year when initial provision appears wrong

Government		Public corporation		
Provision:				
D9P	- 600			
B9	0	B9	0	
B9P	+ 600			
<hr/>		<hr/>		
	F67	- 600	F2	- 600
	B9f	0	F4	- 600
	B9Pf	+ 600	B9	0

These series of T-accounts illustrate that the change in the provision affects the accounts of the period when the provision is changed. In this example, the deficit including provisions (B9P) was first impacted negatively by an amount of 800 (the year the provision was made) but, in a subsequent year, as it appeared that this estimate was to be revised, it is compensated by a surplus of 600 ⁽³¹⁾.

Other interesting cases should be analysed using this prism of provisions. In the MGDD, there is a recommendation to record a 'capital transfer' in case a capital injection is made in a public corporation to cover losses. What is the nature of this 'transaction'? It is in fact an 'impairment provision' (i.e. government accountants estimate that the value of the shares bought are lower than their nominal value). This implies the recording of a (non-symmetrical) 'capital transfer' at inception but also the possibility that, if this initial estimate was wrong, a reverse (non-symmetrical) 'capital transfer' to be recorded later. It is to be noted that none of this should affect

the accounts of the company, which remains with the same amount of shares in its accounts. In other words, this is a provision.

Overall, the inclusion of the mechanism of provisions would make GFS more logical. It would also resolve problems that were hidden before, and would make GFS more consistent with public sector accounting.

Does it mean that GFS should accept all types of provisions recognised by public accounting? To this question, the answer must be prudent. Pension obligations technically correspond exactly to a provision (i.e. a liability of uncertain timing or amount). But one knows how sensitive the issue of recording pensions is to the network of European public finance experts (see next section). This issue should be disconnected from the issue of agreement on the principle of provisioning. In other words, accepting the principle of provisioning does not oblige GFS to recognise all types of provisions.

8. Pension provisions

This item is, in some way, an outlier in this paper, because, in this case, the issue is not convergence between the GFS and public sector accounting, but convergence within each camp (inside the GFS camp itself and inside the public sector accounting camp itself)! The main substantive, and unresolved, issue at the origin of this double internal split is how to record the unfunded pension obligations of government to its own employees, and, as a sub-issue, how to record social security pension obligations.

⁽³¹⁾ One could illustrate the difference of these new T-accounts with the current ones, by showing also the latters. To simplify, let us just say that this would show that the existence of a fourth call cannot be recorded in the current system, as, by definition, the current system records the initial capital transfer of 700 as a transaction, and not as a provision. Indeed, in the current system, after the third call, the debt does not 'exist' any more in the corporation's accounts. So a fourth call cannot exist! As regards the reversal intervening in the third T-account, the case of three calls for guarantees is one for which GFS itself envisages the possibility of this reversal, whereby the corporation, finally and contrary to the assessment made by the accountants after the third call, may be in fact, some time later, in a position to 're-assume' its debt (see Eurostat (2014), & VII.4.2.1.6). In this case, GFS recommends reversing the transaction (this is that a capital transfer is recorded from the company to the government). This confirms the nature of the initial capital transfer of 700, which is not a transaction, but a provision.

We have, on one side, a majority of non-European OECD statisticians, joined by IPSAS and part of public sector accountants, in favour of recording the *unfunded* pension obligations of government to its employees *on* balance sheet; and, on the other side, a majority of experts of continental European countries and Japan, whether statisticians or public accounting standard setters, wanting to keep it *off* balance sheet. The difference can be massive in terms of data: for example the gross general government debt of the USA (which includes these liabilities) is reduced from 122.5 % of GDP to 102.1 % (2012 data) when applying the European approach. The conceptual origin of these diverging views is explained in Box 8.

The issue has led to innumerable exchanges during the preparation of the SNA 2008 in the years 2004–2006, but remained unresolved, no camp wanting to accept a compromise. At the end, the SNA left the issue open, allowing both recordings. As a result, even inside the GFS community, there is

currently (and very unfortunately) a massive non-comparability at the OECD level (i.e. when comparing non-European OECD members to European OECD members). The OECD is currently obliged to exclude from the figures transmitted by USA, Canada or Australia the value of these government pension obligations in order to make non-EU members' debt figures comparable to EU members' debt figures.

Fortunately, inside the EU, there is full comparability as the ESA, contrary to the SNA, did not leave any option and the ESA is compulsory for EU member states! But the comparability has been obtained by excluding the liability for these pension schemes from the core accounts of the general government.

BOX 8: THE CONCEPTUAL ISSUE OF GOVERNMENT PENSION OBLIGATIONS

The issue in terms of accounting for pension obligations has always been a difficult one. It is only in recent decades that, starting with IAS 19, business accounting standards resolved to systematically impose the inclusion of all pension obligations in the balance sheets of sponsor companies, based on a full-fledged actuarial calculation of the pension obligations, whether for defined contribution schemes or defined benefits schemes. On the GFS side, the SNA 93 had restricted the recording of these liabilities to the case of funded pension schemes. By definition, defined contribution schemes are funded (even if they may be underfunded). So under SNA 93, pension liabilities under defined contribution schemes were recorded on balance sheet. On the contrary, most defined benefits schemes are unfunded and Pay As You Go. Thus, under SNA 93, pension obligations of defined benefits schemes were not recorded as liabilities, and this applied in particular to government schemes for their own employees (and social security schemes).

Based on progress made by IAS 19 and on the strong logic that it should not be the fact of whether it is funded or not which should determine whether the sponsor of the scheme should record a liability but the strength of the commitment to have to pay pensions in the future, many statisticians proposed to incorporate the IAS 19 recommendation to the SNA 2008, even if they stepped back from proposing the extension to social security schemes. They proposed to extend the recognition of a pension liability to all 'employer schemes', including government as an employer and including unfunded defined benefits schemes. As in IAS 19, the pension obligations would have to be calculated using actuarial methods.

To make a long and complex debate short at the risk of hurting some parties, the problem posed by this approach to some major European countries was its inherent contradiction between the treatment of government civil servant schemes and the treatment of social security schemes. In some major continental European countries, there are no substantial independent employer schemes but a general collective social security scheme which constitutes the major protection scheme for employees and to which all employers are obliged to participate⁽³²⁾. Historically, in some countries, the only employer scheme autonomous from social security is the government one for its civil servant. In this context, these countries were shocked by the fact that the only scheme for which there would be recognition of liability in the SNA would be the government one. Some even raised a real issue which is that this difference in accounting treatments could be easily circumvented by governments by simply changing the institutional setting of its scheme by merging it to the general social security scheme. To be completely honest, this conceptual discussion in Europe was also dominated by a fear of showing major increases in the level of general government debt (which was already a problem, even if it had not reached the extreme of the post 2008 financial crisis).

The good news for future convergence is that the SNA and the ESA jointly recommended compiling and publishing an additional table (but *off* balance sheet) in which all pension obligations of governments would be recorded whether funded, unfund-

ed, for civil servants or for social security. Based on this table, which should be available in 2017 for

⁽³²⁾ On the contrary, in the USA, Canada or Australia, the main pension schemes are private employer sponsored schemes, the social security being only a scheme limited, to make it simple, to the poor. Thus the contradiction is not apparent for these countries.

European countries, there will be the possibility of better international comparability on the basis of an extended definition of pension liabilities, including these contested ones. In particular, the OECD will be in a position to improve the international comparability of its debt figures.

The issue for European countries is not that it is technically difficult to estimate by actuarial methods these often called ‘implicit liabilities’. Even the public accountants of the two largest euro area countries (Germany and France) now officially publish an estimate of these amounts, keeping them prudently *off* balance sheet. The issue is ‘political’ in the sense that a majority of European policy makers prefer a concept of general government debt excluding these liabilities.

In this context, it is essential to keep in mind that the Maastricht definition of general government debt excludes pension liabilities *in general* (even when the scheme is funded!), so this is a non-issue in terms of concrete European public debt monitoring.

It is easy to criticise the Maastricht approach: as a principle, the pension of civil servants correspond indeed to the definition of a liability and thus are not ‘implicit’ but ‘explicit’ and should be included in the debt of their employers, the government entities, similarly to what is requested from private corporations. However, is it really useful to include them in the definition of an operational public debt target? In a forthcoming paper, OECD economists are in favour of such an inclusion (see OECD (2015)). Also, the definition of public debt in the IMF Public Sector Debt manual includes those liabilities. At the same time, all the OECD Economics’ Directorate calculations on the sustainability of public debt are

made excluding these liabilities.

Also, for example, what would the current hot debate on the sustainability of the Greek debt gain from *adding* to the already massive 175 % ratio of debt over GDP the large amount of ‘implicit’ debt that the government owes to its employees? Of course, this liability exists. Of course, there is, at the time of writing, this dramatic decision for the Greek government, confronted to a liquidity crisis, to have to choose between paying its pensioners and reimbursing its international creditors. So the two debts are linked. However, the nature of the pension debt is different: (1) the ‘creditors’ are Greek government employees, not banks, central banks or European governments! (2) this debt is not tradable; (3) the current cost of this debt is already included in the deficit (pensions payments are included as expenditures)⁽³³⁾. In this condition, is it really useful to discuss the sustainability of the public debt based on a single number which adds two very different types of debt?

In any case, if it was decided one day that pension obligations were to be recorded *on* balance sheet in the EU, there would be two necessary technical conditions which would need to be implemented:

- (1) the use of a common discount rate. Considering the massive impact of the choice of the discount rate on the amount of the actuarially estimated obligation, and its arbitrariness, it would be irresponsible to allow using different discount rates among Member States;
- (2) the headline surplus/deficit should be protected from the volatility of the changes in the estimate of pension obligations. If not, it would be made even less useful for fiscal target making.

9. Revisions, retroactive application of changes and correction of errors

This issue may look like a marginal one, but, in the day to day life of compilers of government data, it is an important one. Factually, GFS are often revised, while public accounts are not. While it may

look at first sight that GFS and public accounting completely diverge on this point, this is an invalid simplification. Their principles are consistent, even

⁽³³⁾ Albeit not on an accrual basis.

if their practices are different. It is the author's view that, while the practice of GFS is better, GFS can still gain significant clarity by inspiring itself from the principles of public accounting which, in this case, are more extensive and precise.

In GFS, high importance is (rightly) given to the publication of consistent time-series. It reflects the fact that users of national accounts (macro-economists) use these data with a historical perspective⁽³⁴⁾. For the most sophisticated users, the data even feed econometric models that need long and consistent time-series in order to obtain the parameters of the model. Thus, GFS compilers feel compelled (even if it is costly in time) to revise as much as possible past data to avoid breaks in time series, even sometimes very old historical data. As a result, it is quite impossible to say that a national accounts figure for a given period is, in the end, 'definitive'. It can always be revised! National accountants are used to live with this uncertainty, a sentiment which goes with the fact that national accounts are 'statistics', and not, despite their name, 'accounts'. For example, a substantial part of GDP is indirectly estimated and the parameters of this estimation evolve in time.

This is less true of GFS (despite the 'S' at the end), which relies on direct and exhaustive sources. However, these sources are not all available at the moment the first GFS account is published (in Europe, this is, for the annual accounts, end March $Y + 1$), and thus estimates must be made for the missing parts which must be corrected when the source data are made available later in the year. In European GFS, the sources are quasi-complete for the second notification (October $Y + 1$). But even in this case, there is no assurance that the data cannot be revised later because of errors, whether they are purely technical errors, late discovery of misinterpretation of methodological rules, or changes in methodological rules (e.g. implementation of ESA 2010).

This constant revision of past GFS data is annoying for some users. It gives an impression of fragility, which harms the credibility of GFS. Moreover it is even seen as heretical by some pure accountants

⁽³⁴⁾ Even if, for the purposes of EDP, it seems that almost all attention is on the latest year.

who, on the contrary, consider their accounts as definitive the first time they are published. Public accounts for a given year are indeed, like business accounts, seen as being published only once, and (nearly) never revised. This is essentially because, contrary to statisticians, public accountants generally publish their accounts (and auditors give an opinion) only when they have all the information on all the individual entries of the entity for the given period, including (presumably for precautionary purposes) events in the early part of the following accounting period. Second, the use of these accounts is not seen in a time series perspective by public accountants. Priority is given to the latest income account and balance sheet.

Does this mean that, contrary to statisticians, accountants are perfect and there are no errors, or even fraud, discovered later? The answer is NO. Accountants (and their auditors) are not perfect. However they simply do not feel it necessary to correct the old accounts when the need for correction arises, and usually limit themselves to incorporate the indirect impact of these late discovered errors in the most recent accounts. For example, if unpaid expenditures are discovered after the publication of the accounts (whether error or fraud), the already published account for this given past year will not be revised. However, the opening balance sheet of the current year will take into account this additional payable. Confronted to such a case, GFS are much more transparent. They will not only revise the opening balance sheet of the current year but they will surely revise the account of the year that was already published, in order to incorporate these expenditures into the period in which they belong. This is consistent with the priority of avoiding breaks in the time series. These late-discovered expenditures were indeed part of the expenditures of this past year, and should be recorded as such, so that the time series of expenditures is correct.

It is however very important to understand that, while GFS may be better in correctly revising the past, the principles are common to the two systems. It is simply that the public accounting community seems to be ... lazy. It remains that, even if it can look strange to the GFS community, the principles regarding revisions are better expressed in pub-

lic sector accounting standards than in GFS ⁽³⁵⁾ and the following paragraphs will explain how the transposition of these principles could improve the practice of GFS compilers.

First, we need to define and distinguish between ‘prior period errors’, ‘change in accounting estimates’, ‘events posterior to the closing date’, and ‘changes in accounting policies’.

9.1. Prior period errors

‘Prior period errors’ include pure errors, misstatements, including voluntary misstatements such as fraud. Public accounting recommend in that case to ‘correct the prior error retrospectively in the first set of financial statements authorised for issue after their discovery by: (1) restating the comparative amounts for prior periods presented in which the error occurred; or (2) if the error occurred before the earliest prior period presented, restating the opening balances of assets, liabilities and net assets/equity for the earlier period presented’ (IPSAS 3, see IPSASB (2011)). In more mundane terms, this means that the error is to be corrected in the past accounts, but if no past account is published alongside the current account (which is mostly the case in public sector accounting) to limit oneself correcting the opening balance of the current account.

This principle of correcting past errors is totally in the spirit of GFS, as GFS is open to revise past accounts and systematically publishes time series. By revising past GFS accounts, the opening balance sheet of the current account is automatically revised. However, there have been discussions in the European GFS community on whether correction of errors that may sometimes be voluntary (a possible case of manipulation of data) should rather impact the current account and not past accounts. The underlying idea was to ‘punish’ the bad reporting entity by impacting the current surplus/deficit as this ‘hurts’ more than impacting past surplus/deficit. However, this idea confuses accounting principles and deterrence of manipulation of data. Manipulation or fraud or serious negligence is to

be sanctioned by appropriate means ⁽³⁶⁾ but not by modifying the economic substance of the accounts. If previously non recorded expenditures are found later, whether deliberately hidden or not, they still belong economically to the period in which they were made. This idea of ‘post punishment’ being discarded, we can conclude that for the correction of errors, GFS follows the same principle as public accounting, and is even more efficient.

9.2. Change in accounting estimates

But GFS is not so clear on this second field. In public sector accounting, ‘changes in accounting estimates’ cover the cases where an estimate has been made about an accounting entry (essentially provisions) at the time of the publication of the accounts, and, in a subsequent period, the economic or legal parameters that governed this first estimate change and modify the initial estimate. In this case, public accounting standards recommend not to revise the past, but to impact the current account:

‘The effect of a change in an accounting estimate shall be recognised prospectively by including it in surplus or deficit in the period of the change.’ (IPSAS 3, see IPSASB (2011))

This is where the practice of GFS probably differs most from public sector accounting standards. Indeed, GFS compilers are so used to revise past data, that they will tend in all cases to systematically revise the past surplus/deficit, and not the current one. For example, some Member States record in their GFS accounts two entries on tax revenues: (1) they have solid information on taxes due and record it as such as a revenue; (2) but they recognise that part of it will be never collected and so they (correctly) record, at the same time, an implicit ‘tax provision’ (so-called ‘taxes unlikely to be collected’) which comes in deduction of taxes due. This latter entry is typically, in accounting terms, a provision, in the sense that, as time passes, this uncertain value becomes more certain and this changes its estimation. However, contrary to the mechanism of provisions which was explained in section 7 and

⁽³⁵⁾ It is to be noted for example that there are two entire IPSASs (IPSAS 3 and 14) on these issues but no chapter of the MGDD.

⁽³⁶⁾ Which now exist: see Article 8 of Regulation 1173/2011 which allows Eurostat to propose to Council a financial sanction in case of manipulation of deficit and debt figures.

to the recommendations of public sector accounting standards for ‘changes in accounting estimates’, the revision of this entry is made, in GFS, in the accounts of the *original* period, rather than in the *current* period. In other words, GFS tend to correct the estimated provision in the *original* period, while using economic information which is *posterior* to the date of reporting.

For the defence of GFS, one must note that much more ‘estimation’ needs to be done in GFS reporting than in public accounting. Indeed, when compiling the first GFS results for a given period, not all individual source accounts are available. For example, in many Member States, accounts are not available for all municipalities for the first publication in April $Y + 1$. A global estimate has to be made, based, for example, on a sample of municipalities. Of course, this estimate needs to be revised later in the year, when the public accounts of all municipalities are finally available.

This type of estimation should not fall under the principle of public sector accounting relating to ‘changes in accounting estimates.’ This would totally confuse the users of GFS data. So in GFS things are more complicated and one needs to distinguish two cases: (1) the case of early estimations due to the unavailability of some accounts, which should not fall under the principle of changes in accounting estimates; (2) the case of estimations relating to the value of assets or liabilities at the reporting date of the accounts, which should fall under the principle of accounting estimates.

It is important to understand the difference in the rationale between the two cases. In the first case, the data are simply not available. In the second case, the rationale is that the accounts should show the situation of the entity, including its ‘uncertain accounting entries’, based on the economic environment at the date of the reporting. Taking as an example the tax provision (‘unlikely to be collected’) case mentioned above, existing information at the date of the reporting period led to a given first estimate. This estimate which was attributed to the initial period, should not be changed later, when the economic environment changes, because this change in economic environment was not known at the date of

reporting. On the contrary, the change in the estimate should be attributed to the later period. In other words, the initial estimate was wrong but not because of an error at inception, but because of a change in the economic environment that occurred in the following period. In this context, it is the later surpluses/deficits which should be impacted.

The conclusion is that GFS should continue to revise their first estimates as long as this is due to the late availability of accounts, but modify their practice as regards variables that are similar to provisions, where changes could impact the following period(s).

9.3. Events occurring after the reporting date but before the date of issuance

In public accounting standards (IPSAS 14, see IPSASB (2011)), one distinguishes between two dates: the ‘reporting date’, which is the date reflected in the balance sheet (generally 31/12/Y), and the ‘date of authorisation of issue’, which is the date the accounts are certified by the auditors (generally, at least for central government, between March and July of year $Y + 1$). Public sector accounting standards give recommendations about how to deal with events occurring between the two dates. During this short period, errors may be discovered, new information may be obtained, and economic parameters may vary. The very practical issue is: should this new information affect the accounts of year Y (which are in the process of being compiled but are not finalised) or the accounts of year $Y + 1$? The two preceding sections give a clear answer for the case of errors (they should affect Y) or change in accounting estimates (they should affect $Y + 1$). But some other cases may be debatable, in particular events that confirm, during this short period between the two dates, that what could be considered at 31/12/Y as a contingent liability, has become in fact a liability. In particular, ‘*the settlement after the reporting date [and before the date of authorisation to issue] of a court case that confirms that the entity had a present obligation at the reporting date*’ (IPSAS 14). In this very particular case, the rationale is that, if, during this short period, there is confirma-

tion that what was contingent on 31/12/Y has now become non-contingent, then, prudent accounting implies to immediately recognise this in the balance sheet of Y, not waiting for the account of Y + 1. This is a sensible approach because it recognises liabilities as early as possible.

The difficulty in implementing this good principle in GFS is that there is no real 'date of authorisation to issue' in GFS. Currently there are two important dates in the year for EU GFS: 21/22 April and 21/22 October, which are the dates of the publication by Eurostat of the two notifications. But can 21/22 April be considered as the date of authorisation to issue consolidated GFS data? This is not realistic as each country's accounts are the consolidation of tens of thousands of accounts which have individually different 'dates of authorisation to issue', many of them posterior to this date. The only realistic way to transpose the sensible approach of public accounting in GFS is therefore to apply the principle on a case by case basis, based on the recording in the underlying individual public account, as long as the latter respects IPSAS 14 or a similar public accounting standard⁽³⁷⁾. For example, if a court case confirms that, for this particular local government, what was recorded as a contingent liability is now a full fledge liability, then GFS should apply the principle of IPSAS 14 for the accounts of this local entity, using as date of authorisation the date corresponding to this local government account. This would mean that IPSAS 14 would apply to GFS only when (correctly) applied by each individual entity and at the date of authorisation for issue corresponding to the specific one of this individual entity.

9.4. Change in accounting policies/ methodologies

This is a field in which both systems already completely converge. In public sector accounting, 'accounting policies' are defined as '*the specific principles, bases, conventions, rules and practices applied by an entity in preparing and presenting financial statements*'. Transposed to GFS, which prefers the terminology of '*methods*' or '*methodological*

framework', this translates very pragmatically into the rules, recommendations, methods set by (or derived from) the current operational version of the SNA/ESA and its accompanying interpretative methodological guideline, which is the current operational version of the MGDD.

Both systems agree in recommending that changes in accounting policies/methodological framework are applied retrospectively as much as possible, as if this new accounting policy had always been applied. IPSAS 3 (see IPSASB (2011)) states: '*Users of financial statements need to be able to compare the financial statements of an entity over time to identify trends in its financial position, performance and cash flows. Therefore, the same accounting policies are applied within each period and from one period to the next.*' Practically the same words would be applicable to the GFS/MGDD, which, for example, requires that the change from ESA 95 to ESA 2010 is applied retrospectively. The difference with public accounting is that the meaning of 'retrospective' in GFS is much deeper than in public accounting. Where public accounting would be satisfied of an application '*from one period to the next*', the ESA 2010 transmission program makes it compulsory to implement retrospective application of the changes introduced by ESA 2010 for a minimum period of nearly 20 years! Some (rare) Member States even revise their accounts further back than that.

However, while no flexibility should be authorised in GFS when there are massive and organised changes such as the move from ESA 1995 to ESA 2010, some flexibility could be authorised for changes decided on a one-off basis. This is what Eurostat did once, in June 2007, when it published a methodological decision on securitisation operations. The decision specified that its application was non-retroactive and applicable '*only after January 2007*'⁽³⁸⁾. It would be reasonable for the future GFS decisions to replicate in some way what is systematically done in IPSASs, which is to indicate whether the application of the change is retrospective or not, and if not, when it starts to apply.

⁽³⁷⁾ By definition, the verification respect of the standards is left to the national audit authority.

⁽³⁸⁾ See http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/2-25062007-AP1/EN/2-25062007-AP1-EN.PDF

10. Accrual recording of taxes

GFS and public sector accounting share one fundamental principle: accrual accounting. However, in practice, there are nearly as many interpretations of the term ‘accrual’ as experts in accounting. The project of creating a harmonised micro/macro accounting framework cannot satisfy itself with general principles which would have a number of different interpretations. This would be a complete regression compared with the current situation of GFS data in Europe. In the EU, the implementation of GFS under Eurostat supervision in the last 15 years has led to an extremely important ‘acquis’ in terms of very precise interpretation and jurisprudence, allowing to put concretely in practice the essential principle of *equal treatment* of all Member States⁽³⁹⁾. This ‘acquis’ would need to be taken into consideration for any future interpretation committee of any harmonised public accounting standards in the EU.

The recording of tax and social contribution revenues of government is the most important domain in which this harmonised and precise interpretation would have to be agreed upon⁽⁴⁰⁾. Tax is the largest revenue for public entities, while never being revenue for a private entity. Tax is imposed by government on the rest of the economic agents, it is not an exchange. Thus the accounting treatment of taxes cannot be transposed from private accounting and needs a specific approach. In this context, one must note that, during the discussion leading to the Commission report on the suitability of IPSASs (see Eurostat (2013c)), the corresponding IPSAS (IPSAS 23, ‘Revenues from Non-Exchange Transactions’, see IPSASB (2011)) appeared to be the most contentious IPSAS among EU Member States. This shows how much this issue needs continued clarification.

GFS or public sector have more or less the same *theoretical* approach: record a tax asset when the taxable event occurs and the asset recognition criteria are met (i.e. when the fair value of the asset can be

reasonably estimated). But this remains too general. The devil is in the detail. There are at least two main practical issues⁽⁴¹⁾: (1) the exact time of recording: should it be strictly the time of the generation of the tax base? Or should it be the time of the declaration to the tax authority? In some cases, the tax authority cannot estimate reasonably the tax asset before declaration by the future tax payer; (2) the amount to record: on an accrual basis, taxes *due* should be recorded, however, there is a danger of systematically overestimating taxes if one does not take into consideration that part of the taxes will statistically never be collected (failing businesses, etc.).

In European GFS, three options were considered to avoid a possible systematic overestimation of tax revenues: (1) record taxes due, but add an additional negative entry called D99 ‘Uncollectable taxes and social contributions’, which is more or less the equivalent of a provision (in the terminology of public sector accounting, see section 7). This needs modelling this provision based on past data; (2) determine coefficients that can be applied to taxes due to obtain a reasonable amount of net taxes and social contributions that represent the ‘collectable’ revenues, based on historical observed data on taxes due and taxes collected. This is different in presentation to option 1 but similar in substance (it requires modelling of the coefficients from past data); (3) use tax receipts (and not taxes due) as the main source and simply apply time lags on observed revenues to take into account the delay in the collection of certain parts of the taxes. This third option is particularly adapted to taxes on products, such as VAT.

The experience in the last decade has led Eurostat to strongly recommend to use time-adjusted cash receipts (option 3) as it appeared that the models used for options 2 and 3 could be somewhat arbitrary and keeping them relevant through time extremely challenging — where business cycles can have major impacts on collection of taxes. To achieve convergence between GFS and public sector account-

⁽³⁹⁾ The acquis is materialised by the MGDD but also by the many Eurostat decisions, and specific ‘ex-ante’ or ‘ex-post’ advices (see <http://ec.europa.eu/eurostat/web/government-finance-statistics/statistics-illustrated>)

⁽⁴⁰⁾ In order to lighten the wording of the rest of this section, the term ‘tax’ will cover both ‘taxes’ and ‘social contributions’.

⁽⁴¹⁾ Besides these two, there are numerous more minor practical issues to clarify around taxes, of which, for example, payable tax credits.

ing, one needs a serious and common methodological investment by both parties to clarify these two issues: exact timing of recording and amount to be recorded. The author is convinced that, in this do-

main, the practical experience accumulated by GFS experts in Europe should usefully be taken into consideration by public sector accountants.

11. Other differences of more minor importance

In sections 3, we have listed an extensive set of differences between the two systems. At this stage of the paper, around half of them have been discussed. The paper would be much too long if one wanted to discuss the remaining items in detail, and the author has not the sufficient specific expertise to do it. We will therefore limit ourselves to some short comments simply aimed at launching future discussion.

- *Detail of timing of accrual expenditure (e.g. timing of military expenditure):* both GFS and public accounting record expenditure on an 'accrual' basis. But, if a common micro/macro convergence is sought, there is a necessity to define what is the exact timing of 'accrual': is it at delivery, at reception of the bill, at another time? This applies in particular for military expenditures in which GFS has taken a special position, which needs to be compared with the public accounting practice.
- *Treatment of Service concessions and Public Private Partnerships (PPPs):* the current divergence between the two systems is artificial and probably only due to the fact that the systems

have not evolved at the same rhythm. In the future, GFS should probably simply align on IFRS/IPSAS.

- *Super-dividends:* all issues relating to the specific relations between a government and its controlled (but not consolidated) public corporation are completely specific to GFS and foreign to public accounting. Indeed, public accounting consolidates all controlled public corporations within the reporting entity! However, as the common micro/macro system which is envisaged by this paper will have, as explained in section 4, to adapt to the perimeter of 'general government', these issues will resurface, and the experience gained by GFS should prevail.
- *Research and development and software:* GFS capitalises R&D and software expenditures, while public accounting does not. However, this difference has no importance if, as discussed in section 5, the balancing item used as the main target for fiscal monitoring remains 'S13-B9' rather than the public accounting surplus/deficit (close to 'S13-B8N').

12. Enhancing the analytical usefulness of public accounting standards

During the discussions that led to the Eurostat report on IPSAS (see Eurostat (2013c)), one participant in the relevant Task Force made the quite interesting and logical point that, as in Europe GFS was more and more the really important framework because of the increasing monitoring of fiscal policies directly by the Commission, GFS could become

the framework to be applied not only at the *macro* level, but also at the *micro* level!

This idea, however sympathetic it is to the GFS community, is unrealistic, because GFS (i.e. SNA/ESA/EDP) has not been created in this spirit. No basic accountant will find in the SNA, or even in

the MGDD, the concrete guidelines necessary to allow him/her to record a basic tax receipt, or a basic bill in the correct way. The GFS system has been thought from the beginning as *macro*, based on the use of existing public accounts that are only *macro* transformed.

Thus if one really thinks, like this author, that it will be possible one day to have a unique micro/macro framework, one must admit that the public accounting standards will constitute the core of it, as they are constructed with the objective of creating the precise guidelines adapted to the tens of thousands of basic accountants in charge of building up the accounts of public entities in Member States, in a *bottom-up* approach. These guidelines should be precise, adapted to individual transactions, controllable and auditable at the lowest level of transactions.

This objective is completely foreign to statisticians. So the *micro* standards would necessarily be at the core of any unique micro/macro system, even if they have to adapt as discussed in this paper on some *macro* issues such as consolidation, balancing items, accrual accounting of taxes, etc.

13. Conclusion

As announced in the introduction, this paper does not intend to have an impact in the short-term. The table below summarises the domains for which there would need to be compromises in order to achieve, in the long-term, convergence in the EU context. The table indicates who, in the view of the author, should move towards the other, and the difficulty of the task. As can be seen, the program of work is quite impressive, even deterring. But it should not deter those who have the strong objective of improving the collective tools for the monitoring of fiscal policies in Europe.

In the 1990s, GFS was chosen as the accounting framework for this fiscal monitoring in part because it was the only harmonised system of accounting for government across Europe. If European harmonised public accounting standards benefit from the qualities of both its parents (GFS

However, the GFS macro system has some very interesting structural features that the micro system could benefit from, including at the lowest level of transactions and of accounting systems. There are at least four of them ⁽⁴²⁾:

- (1) detailed classifications (by nature/by function of expenditures — i.e COFOG);
- (2) the principle of a developed and harmonised chart of accounts, greatly facilitating the international comparability of the published accounts;
- (3) a timeliness adapted to the EU fiscal monitoring agenda ⁽⁴³⁾ and a quarterly frequency (with lower detail) in addition to an annual one;
- (4) at the maximum, the absence of implementation options, as the principle of options goes against international comparability.

By adopting these four important structural features, public accounting standards would greatly enhance their analytical usefulness and the convergence between the two systems would be even more complete.

and current public accounting standards) could be adopted in the EU, this would make a default choice become a fully rational one.

If this does not happen, the author would be at least satisfied if this paper could have contributed to incite national accountants to systematically look at the practice of public accounting standards before making new methodological decisions, and justify any departure from it, and if, conversely, public accounting standard setters could take more into account the fiscal rules of the EU in order to remain relevant for macro fiscal policies in Europe.

⁽⁴²⁾ More on this can be found in Dabbico (2013a).

⁽⁴³⁾ The availability of accounts developed under current national (or future harmonised) public accounting standards in time for the first notification is essential for their relevance in EU macro fiscal monitoring. Today, the first notification is end March. This is early for any accounting system, in particular if one wants to use the accounts verified by auditors. June would be more realistic.

Table 1: A synthesis of the issues discussed in the paper

Domains of divergence	Who should move?	Level of difficulty of convergence
Definition of perimeter of consolidation	Public accounting	Low
Concept of control	GFS	Low
Definition of surplus/deficit	Public accounting	Low
Treatment of holding gains	GFS	Medium
Valuation of liabilities	Public accounting and GFS	Low
Concessionary loans	Public accounting	Medium
Provisions	GFS	Medium
Pension provisions	GFS and Public accounting	High
Revisions, retroactive application of changes, errors	GFS	Low
Accrual recording of taxes	Public accounting	High
Detail of definition of timing in accrual accounting	GFS and public accounting	High
Service concessions, PPPs	GFS	Medium
Super-dividends, relations between GG and public firms.	Public accounting	High
R&D and software	Public accounting	High
Detailed classification	Public accounting	Low
Chart of accounts	Public accounting	Medium
Timeliness	Public accounting	Medium
Options in implementation	Public accounting	Low (as a principle) but may be High (in practice)

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Will the concept of goodwill go well with national accounting?

Itsuo Sakuma ⁽¹⁾

3

Abstract: The purpose of the present paper is to examine the concept of goodwill in the context of national accounting. Goodwill, originally a business accounting concept, was incorporated into the SNA in its 1993 version as a category of intangible non-produced assets, even though Japanese national accounts have never included it. The 2008 SNA introduced a composite category called goodwill and marketing assets and included it in the list of non-produced non-financial assets. By recognising that goodwill is just essentially net worth (as a national accounting concept) with the sign reversed, it may be very natural to ask whether it is necessary or not for national accounts. This paper gives a negative answer to the question and seeks to show that national accountants can fully and reasonably deal with business acquisitions without the concept. Some facts from business accounting history about the concept may bring insight into the problems involved.

JEL codes: E01, M41, G34

Keywords: SNA, Goodwill, Net worth, Tobin's Q

(¹) School of Economics, Senshu University.

1. Introduction

Goodwill is a business accounting concept that is used in national accounts, although this concept has never been included in Japanese national accounts. Business accountants would understand that the concept of goodwill is defined in national accounting in the same way as in business accounting by reading the following citation from the SNA ⁽²⁾:

‘Potential purchasers of an enterprise are often prepared to pay a premium above the net value of its individually identified and valued assets and liabilities. This excess is described as “goodwill” ...’ (2008 SNA, paragraph 10.196)

In the 2008 SNA, a composite category called *Goodwill and marketing assets* is introduced, which includes marketing assets such as brand names, mastheads, trademarks, logos and so on, as well as goodwill. The description of this composite item is as follows:

‘The value of goodwill and marketing assets is defined as the difference between the value paid for an enterprise as a going concern and the sum of its assets less the sum of its liabilities, each item of which has been separately identified and valued. Although goodwill is likely to be present in most corporations, for reasons of reliability of measurement it is only recorded when its value is evidenced by a market transaction, usually the sale of the whole corporation. Exceptionally, identified marketing assets may be sold individually and separately from the whole corporation in which case their sale should also be recorded under this item.’ (2008 SNA, paragraph 10.199)

Here, special attention should be paid to the meaning of the term ‘liabilities’. In the citations above, as business accountants understand the term, it is defined as excluding shares and other equity issued by the enterprise to be acquired. However, when national accountants define net worth as the value of all the assets owned by an institutional unit or sector, less the value of all its outstanding liabilities,

they regard shares and other equity as liabilities ⁽³⁾.

Thus the term ‘liabilities’ is given two different meanings in the 2008 SNA. In defining goodwill (and marketing assets) as described above, shares and other equity are excluded from the list of liabilities (as in the business accounting definition of liabilities). However, when net worth is defined in the context of national accounting, shares and other equity are included in the list of liabilities (i.e. national accounting concept of liabilities) ⁽⁴⁾.

By comparing the two concepts, goodwill and net worth (in the context of national accounting) ⁽⁵⁾, you can find a close relationship between the two. That is, in the case of a corporation that has just been purchased and merged by another corporation acquiring the whole equity ⁽⁶⁾.

Net Worth (national accounting) = Assets – Liabilities (business accounting) – Equity (issued ⁽⁷⁾),

and

Goodwill = Equity (issued) – [Assets – Liabilities (business accounting)],

therefore,

Goodwill = – Net Worth (national accounting).

Then, a natural question may be whether the concept of goodwill is necessary or not in the SNA as it is just *net worth with the sign reversed*.

The purpose of the present paper is to examine the concept of goodwill in some detail. The above question will be answered negatively. It will be shown that national accountants can deal with business

⁽²⁾ It may be easily understood by taking a glance at Table 13.1 in the 2008 SNA, for example.

⁽³⁾ Note that in United Nations (1977), the balance sheet version of the 1968 SNA, liabilities except shares and other equity are called ‘third-party liabilities’ while equity including shares is called ‘second-party liabilities’.

⁽⁴⁾ The term ‘net worth’ is used in business accounting as well, though in the context of business accounting, the list of liabilities excludes shares and other equity. The net worth formulated this way may be called the business accounting concept of net worth.

⁽⁵⁾ It is presupposed that the former corporation has not experienced any acquisition before so that goodwill does not appear in its balance sheet.

⁽⁶⁾ Shares and other equity owned are included in the list of assets in both accounting systems.

⁽⁷⁾ Three versions of the SNA will be referred to in this paper. They are United Nations (1968), Commission of the European Communities et al. (1993), and European Commission (2009), which are referred to as 1968 SNA, 1993 SNA and 2008 SNA, respectively.

acquisitions fairly reasonably without this concept.

The present paper is organised as follows. The next section is devoted to business accounting history concerning the concept of goodwill, as some facts from history may provide insights into challenges we face. Four theories of, or views on, goodwill in business accounting context will be surveyed, on the basis of which, for example, it will be examined whether the introduction of the newly arrived category ‘goodwill and marketing assets’ may be considered to be reasonable or not.

In the third section, the treatment of goodwill in the SNA will be described more fully. In doing so, several important points will be made clear. It will be shown that ‘internally generated goodwill’, another business accounting concept, is not adopted in the SNA (as well as in any business accounting standard) and that goodwill is recorded only when a business (or part of it, as in the case of Sony Corporation’s selling its VAIO-PC business) is traded, so it is called ‘purchased goodwill’. In addition, we will go through topics such as amortisation/impairment

issues, problems related to the treatment of transfer costs involved with the business acquisition, etc. It should be noted that at this stage, the rationale for the concept of goodwill itself will not be challenged.

In the fourth section, focus will be on the rationale of the business accounting concept of goodwill in the national accounting framework. As previously noted, it will be shown that a business acquisition may be fairly reasonably and more naturally described, by regarding it as the purchase of equity, rather than the acquisition of goodwill. It may be noted that a business or part of it to be acquired may be regarded as a quasi-corporation, if not a fully incorporated business. (Purchased) goodwill is, after all, just a *token* of the fact that the business experienced a business acquisition in the past. Finally in this section, a very interesting relationship between the concept of net worth and Tobin’s Q, a macroeconomic concept, will be examined.

Lastly, conclusions will be drawn and proposals will be put forth.

2. Four theories of goodwill: a historical perspective

According to Yamauchi (2010), historically, there have been four views on ‘goodwill’ as a business accounting concept. They are: 1) intangibles theory of goodwill; 2) super-profit theory of goodwill; 3) residuals theory of goodwill; and 4) synergy theory of goodwill. They will be taken up in turn. For the sake of convenience, in what follows, historical cost valuations often found in business accounting will be totally ignored. Instead, the valuation at current prices including valuation at current replacement cost will be presupposed.

2.1. Intangibles theory of goodwill

When an economic entity acquires a business (incorporated or unincorporated), it may pay a sum of money that exceeds the amount of the tangible and identified intangible assets it owns net of related liabilities, if any. This excess amount of money was, according to this theory, deemed to be the sum of

the value of unidentified ‘intangibles’ including, among others, customer loyalty in the current business terminology. These types of payments were legally recognised and established by the late 19th century and called ‘goodwill’. A well-known remark ‘(the goodwill is) nothing more than the probability that old customer will resort to the old place’ was made by Lord Eldon in 1810⁽⁸⁾. More (1891) (p. 282) writes:

‘We all know — in a general way at least — what Goodwill is. It is, I take it, just another name to designate the patronage of the public.’

Thus, the continued patronage of customers including the factor of location was considered to be the essential elements of goodwill in the 19th century. However, by the early 20th century, various items such as good business management (if the old management is retained), excellent reputation, mo-

⁽⁸⁾ As cited in Yang (1927), p. 28.

nopolistic privileges, trademarks (if not separately traded), unidentified knowhow, and favourable attitudes toward the firm on the part of employees, as well as bankers and investors⁽⁹⁾, came to be recognised as intangibles involved in goodwill.

That is, the value of goodwill G may be expressed as the sum of the values of unidentified intangibles I_j ($j = 1, 2, \dots, n$); so that

$$G = I_1 + I_2 + \dots + I_n.$$

It should be stressed that in the 19th century, enterprises were seldom acquired by purchasing their shares in the organised stock exchange. So, it was necessary to evaluate the business itself without resorting to market evaluation. However, for valuation purposes, it may not be so helpful to assume that the value of goodwill must be the total value of intangibles involved.

2.2. Super-profits theory of goodwill

Dealing with the question ‘How the goodwill attaching to a business may be valued as between a willing seller and a willing buyer?’⁽¹⁰⁾, some accountants purported to find another seemingly better definition of goodwill by the early 20th century. Thus, among others, Greendlinger (1925) (p. 166) writes:

‘Good-will has been defined as that intangible quality of patronage which attaches to an established business and is presumed to continue, irrespective of any change of ownership. Perhaps, a better definition would be that good-will represents the present worth or capitalised value of the estimated future earnings of an established enterprise in excess of the normal results that it might be reasonably assumed would be realized by a similar undertaking established anew.’

The term ‘super-profits’ is due to Leake (1914) (p. 82). A pioneering contribution by More (1891)

(p. 285)⁽¹¹⁾ gives a very simple numerical example:

‘A trading company with tangible assets, the full going value of which is ascertained to be £100,000, and suppose it is earning, and is likely to earn, eight per cent., or £8,000 a year. I would say that the total price should not exceed the value of the tangible assets, viz., £100,000, because no more than an ordinary return is being got.

But suppose the concern is earning, and is likely to earn, thirteen per cent., or £13,000 a year, then I think a fair price might be seven annual payments of the extra £5,000, or a present payment of £26,030, being the amount of seven annual payments of £5,000, less eight percent discount. In this case, the price would be the above £100,000 plus £26,030, or together, £126,030.’

Why thirteen percent? The P&L statement of the firm may provide some information needed. Why seven years? While this may be a matter of negotiation between the buyer and the seller, it may be understood that it was taken for granted that goodwill should be depreciated (or amortised). For the superior earning power was considered to decline over time, say, due to competition.

Note that this definition is not contradictory to the older, intangibles theory of goodwill. In fact, Yang (1927), by maintaining basically the older theory, sought to show that the value of intangibles is essentially an expression of the superior earning power of the specific concern. However, it may be stressed that the two theories are logically independent, though some argue that goodwill in the super-profit theory is just a measurement concept.

2.3. Residuals theory of goodwill

The residuals theory of goodwill appeared in the early 20th century and came to be established in the second half of the century. According to this theory, goodwill may be defined as the excess of the value of the business as a whole over the valuations at-

⁽⁹⁾ Concerning the three categories of goodwill, consumer’s goodwill, industrial goodwill, and financial goodwill, see Yang (1927) (pp. 41–56) for example.

⁽¹⁰⁾ This question can be found in More (1891) (p. 284).

⁽¹¹⁾ More’s paper was revised and published as More(1900–01) and the latter was reprinted and included in Lee (1984). According to the introductory note in the reprinted version(p. 65), ‘More’s contribution represents a scholarly paper, well ahead of its time — the usual practice for valuing goodwill being a multiple of total profits minus the valuation of tangible assets (a practice which More did not favour)’.

taching to its individual tangible and intangible net assets⁽¹²⁾.

The residuals theory is considered to be originally due to Canning (1929) (pp. 42–43). He preferred to regard goodwill as ‘a master valuation account’. He wrote:

‘Goodwill, when it appears in the balance sheet at all, is but a master valuation account’.

That is, goodwill is the balancing item for the sub-account, which appears in the balance sheet when a business combination occurs. So, naturally, goodwill becomes a ‘catch-all’ item. More importantly, he also wrote:

‘It cannot under any circumstances be called an “asset”’.

This definition of goodwill is considered to be important in that it is adopted by international and national business accounting standard setters including the Accounting Standards Board or ASB in the United Kingdom, among others. In fact, ASB (1997) (paragraph 2) defines (purchased) goodwill as ‘the difference between the cost of an acquired entity and the aggregate of the fair values⁽¹³⁾ of the entity’s identifiable assets and liabilities’.

At the same time, it may be noteworthy that this definition is quite generally accepted when the concept of goodwill was first introduced into the System of National Accounts in its 1993 version. No less important is the fact that by the second half of the 20th century, the number of incorporated businesses had increased drastically and acquiring businesses by purchasing the outstanding shares on the stock exchange became more common practice. In fact, MacNeal (1939) (p. 233) wrote:

‘The total value of a business as a whole is best expressed by the price of its equities in the market place.’

However, as to the above three views on goodwill, Hendriksen (1977) (pp. 435–369) remarks as follows:

⁽¹²⁾ This definition is found in Hendriksen (1977) (pp. 43–59).

⁽¹³⁾ According to the 1982 version of IAS 16 (IASC (1982)), ‘fair value’ in the context of business accounting may be defined as the amount for which an asset could be exchanged between a knowledgeable, willing buyer and a knowledgeable, willing seller in an arm’s length transaction.

‘The attempts [...] to provide goodwill with semantic interpretation have basically failed. Furthermore, little or no evidence has been found to indicate that the reporting of goodwill provides relevant information for investors or creditors in their decision making. Because goodwill lacks real-world interpretation and cannot be measured independently, it should be omitted from financial statements. This does not mean, however, that aggregations of resources should not be reported separately from measurement of individual assets. Aggregations of resources may have valuations greater or less than the summation of identifiable parts because of synergism among the resources acquired or with resources already owned.’

2.4. Synergy theory of goodwill

According to the *Oxford Dictionary of English*, ‘synergy’ means the interaction or cooperation of two or more organisations, substances, or other agents to produce a combined effect greater than the sum of their separate effects.

By noticing that (purchased) goodwill is recorded when an event of merger and acquisition occurs, it is not difficult to find that there may be some synergistic effects involved. As Hendriksen suggested, there may also be synergistic effects among a number of asset items in the balance sheet of the acquired enterprise as well as the acquiring firm. Because of this, as Schmalenbach⁽¹⁴⁾ correctly argued at latest as early as 1910s, if resources are tied up in a business, they do not possess individual values. Instead, a collection of resources has only a collective value. The following somewhat long citation is from Schmalenbach (1959) (p. 26).

‘If a landlord owns ten houses, he can list their values on the assets side of his balance sheet, the liabilities, including mortgages, on the liabilities side, and the result is a balance sheet which shows the value of his capital. The accuracy of this value depends upon accuracy of the individual valua-

⁽¹⁴⁾ Eugen Schmalenbach (1873–1955) is a versatile German academic whose fields include economics, sociology as well as business accounting. Schmalenbach (1959) is an English translation of his famous book *Dynamische Bilanz* (Dynamic Accounting), which first appeared in 1919 and went through several impressions.

tions. This apart, there is nothing wrong with the procedure.

However, if a man owns a business which is made up of buildings, machines, tools, office equipment, stocks, debtors, creditors and more, he cannot arrive at a true value for his capital by means of the above accounting procedure, no matter how the individual values are arrived at; for the value of a business does not equal the total of the values of its individual parts.

The value of business depends upon its suitability for the manufacture or sale of useful things. If a collection of buildings, machines and stocks are needed for this, then there is a collective value. As long as they are tied up in the business, they do not possess individual values.

The machines had individual values once, before they were installed, when they were still in the hands of a dealer. They can have individual values again, if they are dismantled and sold as used machines. But as long as they are tied up in the factory there can be no talk about individual values.'

The synergy theory of goodwill emerged as the newest theory of goodwill in the late 20th century. Thus, Miller (1973) (p. 281) wrote:

'The essential characteristics of a system is a collection of functioning elements, such as the parts of an automobile engine, that work together as a unified whole because of relationships among the elements of the system. [...] Systems may be most complex. Some are almost incomprehensible as aggregates of elements because interaction of the parts results in synergy.'

In recent decades, this new theory made a big step toward winning general acceptance in wider accounting circles. Many authors, including Ma and Hopkins (1988), Johnson and Petrone (1998), and Yamauchi (2010) among others, have contributed to the development of the theory. At present, no one can deny that the measure of goodwill includes synergies in its core component. In fact, Johnson and Petrone (1998) (pp. 295–296) propose that the term 'core goodwill' exclude intangible elements as well as overpayment (or underpayment) due to any valuation error or fire sale (and so on), but just in-

cludes 'going concern goodwill' and 'combination goodwill'. The former refers to the synergies which may be generated from tying up the assets in the balance sheet of the acquired enterprise and the latter refers to the synergies from combining the two businesses.

Yamauchi (2010) (pp. 146–157) clarifies that the measure of goodwill actually brought into the accounts may include the values of unidentifiable intangibles that are not deemed to be assets in the business accounting standard (human capital, for example), as well as the values of unrecognised intangible assets (certain R&D assets that were recorded as costs incurred as corresponding R&D expenditures were made). Thus, by excluding these values, the purification of the concept of goodwill is possible, at least theoretically.

This may be the right place to consider the newly coined composite item 'goodwill and marketing assets'. Here, a full description of the term 'marketing assets' is given in paragraph 10.198:

'Marketing assets consist of items such as brand names, mastheads, trademarks, logos and domain names. A brand can be interpreted as far more than just a corporate name or logo. It is the overall impression a customer or potential customer gains from their experience with the company and its products. Interpreted in that wider sense it can also be seen to encompass some of the characteristics of goodwill, such as customer loyalty.'

From the historical point of view, we understand that the author is dubious about this treatment, even on the presumption that we would accept the concept of goodwill. For synergies involved in the measure of goodwill and marketing assets such as logos, etc. are so different to be wrapped up in an item.

Understanding goodwill as a synergy is not contradictory with the residuals view on goodwill, as the latter could be seen as a measurement concept. However, as noted earlier, the central claim in Canning (1929) is that goodwill is not an asset, which does not seem to be shared with advocates of synergism.

3. Treatment of goodwill in the SNA revisited

3.1. The introduction of the concept of goodwill in the SNA and challenges confronted

As noted earlier, the 1968 version of the SNA (the 1968 SNA as well as United Nations (1977) as the balance sheet version of the 1968 SNA) lacks the concept of goodwill⁽¹⁵⁾. It was the 1993 version that introduced the concept for the first time, though it is somewhat different from that in the 2008 SNA. What follows is from paragraph 12.22 in the 1993 SNA:

‘When an enterprise is sold at a price that exceeds its net worth, this excess in purchase price over net worth is the asset, “purchased goodwill”’.

However, this definition cannot be applied to the purchase/sale of a corporation if the definitions of liabilities and net worth are to be retained through the system. In fact, in the 1993 SNA, purchased goodwill was necessarily calculated differently depending on whether the business to be acquired was an unincorporated enterprise or a corporation. The following is also from the same paragraph:

‘Two cases must be distinguished. For the sale/purchase of an unincorporated enterprise not treated as a quasi-corporation, the purchased goodwill represents the excess of the purchase price of this enterprise over its net worth (derived from its separately identified and valued assets and liabilities) [...] For the sale/purchase of a corporation or quasi-corporation, the purchased goodwill represents the excess of the purchase price of its shares and other equity over their value just prior to the sale/purchase.’

Accounting procedures for the purchase/sale of incorporated businesses were described in the same paragraph as follows:

‘This excess enters the balance sheet of the seller of shares and other equity prior to the sale as a revaluation of a financial asset so that the shares and other equity can be sold at their purchase price. At the same time, the purchased goodwill enters the other changes in the volume of assets account as an economic appearance of an intangible non-produced asset and is recorded as such in the closing balance sheet of this corporation or quasi-corporation. The sales and purchases of the shares and other equity are recorded in the financial accounts of the seller and the purchaser.’

Thus, in the 1993 SNA, goodwill for the purchase/sale of incorporated businesses was defined differently from the concept in the original business accounting context. This definition of goodwill (specifically for the purchase/sale of incorporated businesses) may sound ridiculous to business accountants. In fact, they have never encountered a treatment of goodwill like that in the 1993 SNA. Thus, the 1993 SNA failed to introduce the concept of goodwill in a way that would satisfy business accountants, although it seems that it did try not to disturb the conceptual framework of the SNA. In passing, it introduced a new category called ‘intangible non-produced assets’, inclusive of goodwill, replacing the older term ‘non-financial intangible assets’.

The 2008 SNA took a different approach. That is, it tried to incorporate goodwill just as business accountants understand the term. However, as a matter of course, the strategy resulted in inconsistencies brought into the system, as was noted earlier. Thus, there were challenges to be met. That is, in order to include goodwill in the list of intangible assets of the conceptual system of the SNA, national accountants need to modify the business accounting concept of goodwill or to tolerate inconsistencies brought in. Incidentally, a new category ‘non-produced non-financial assets’ was created in the 2008 SNA, making the tangible-intangible distinction a fringe one.

⁽¹⁵⁾ Although no mention was made of goodwill in the 1968 SNA or United Nations (1977), it might be quite likely that national accountants had no choice but to use business accounting records to estimate the figures for intangible assets except claims (non-financial intangible assets) so that goodwill could be mingled with intangible assets like patents and copy rights.

In what follows in this section, some additional descriptions of goodwill in the SNA will be given and examined.

3.2. The exclusion of internally generated goodwill

With regard to the definition of goodwill in the 2008 SNA cited earlier in the present paper, it may be noted that goodwill is recorded only when a business (or part of it) is actually traded. This type of goodwill is called ‘purchased goodwill’⁽¹⁶⁾. It is the case with the 1993 SNA version of the concept as well. In fact, according to paragraph 12.22,

‘Goodwill that is not evidenced by a sale/purchase is not considered an economic asset: the only way that goodwill enters the System is for such a purchase to occur’⁽¹⁷⁾.

However, goodwill, which is defined as the excess of the sale/purchase price of the business over its net worth (business accounting concept), may be conceivable even when an actual sale/purchase does not occur, by estimating the sale/purchase value of the enterprise. It may particularly be the case when the incorporated enterprise is listed and its shares are traded in the stock exchange. Goodwill in this case may be called ‘internally generated goodwill’. Business accounting standards uniformly rule out the concept. In fact, for example, Ma and Hopkins (1988) (p. 84) described the concept as an ‘Alice-in-Wonderland’ type of accounting concept. The SNA, in its 2008 version, excludes the concept as well.

The third chapter of Bloom (2008) gives an excellent account of how the goodwill write-up was temporarily condoned and brought an anomaly into the accounts in the early 20th century before the Depression era and how non-recognition of internally generated goodwill was established in the United States after the period.

⁽¹⁶⁾ The term ‘purchased goodwill’ may be used in another context in which the amount does not include the minority owners’ equity. The 2008 SNA is not so clear about how you can deal with it.

⁽¹⁷⁾ The first half of this sentence may be found in paragraph 12.26 in the 2008 SNA as well.

3.3. Negative goodwill

According to the definition of goodwill in the 2008 SNA, it may be understood that goodwill may well be negative. In fact, the 2008 SNA specifically accepts that the measure of goodwill can be negative. What follows is from paragraph 12.33:

‘The value (of goodwill) may be positive or negative (or zero). By its calculation and designation as an asset of the enterprise, the net worth of the enterprise at the moment it is bought is exactly zero, whatever the legal status of the enterprise.’

The treatment of negative goodwill in business accounting standards varies. Regarding it as a profit on acquisitions, seems to be a typical response to the situation by business accountants. From what is cited, again, it may be known that goodwill + net worth (in the sense of national accounting) = zero.

3.4. Appearance of goodwill in the accounts and amortisation/impairment

According to paragraph 12.34 in the 2008 SNA, the recording of the appearance of goodwill (and marketing assets) will be made as follows:

‘The value of purchased goodwill and marketing assets is calculated at the time of the sale, entered in the books of the seller in the other changes in the volume of assets account and then exchanged as a transaction with the purchaser in the capital account.’

The entries are as follows. Goodwill and marketing assets first appear in the balance sheet of the seller via the other changes in the volume of assets account. The entry is an economic appearance of a non-produced non-financial asset. Then the disposals (acquisitions) of the item are recorded in the capital account of the seller (the purchaser) as ‘disposals (acquisitions) of non-produced non-financial assets’. And then, goodwill and marketing assets are recorded in the closing balance sheet of the purchaser.

The next step is to record the amortisation of the asset in question. What follows is from the same paragraph:

‘Thereafter the value of the purchased goodwill and marketing asset must be written down in the books of the purchaser via entries in the other changes in the volume of assets account. The rate at which it is written down should be in accordance with commercial accounting standards. These are typically conservative in the amount that may appear on the balance sheet of an enterprise and should be subject to an “impairment test” whereby an accountant can satisfy himself that the remaining value is likely to be realizable in case of a further sale of the enterprise.’

Business accounting rules concerning amortisation (and impairment tests) vary over time, as well as from country to country. Thus, while the IFRS (International Financial Reporting Standard) prohibits amortisation and requires the implementation of an impairment test at least once a year, a regular amortisation of goodwill over its economic life (20 years at longest) is mandatory under Japanese business accounting standards. However, to enhance international comparability of business accounting records, voluntary application of the IFRS rules started from the consolidated fiscal years ending on or after March 31, 2010 in Japan. It may be worth mentioning that business circles in Japan claimed that the application of the IFRS rules to financial reporting would encourage M&A activities by Japanese companies.

Nevertheless, some business accounting specialists in Japan now argue that the application of the IFRS rules will make some accounting figures, including profits in addition to goodwill itself, rather unstable over time. Thus, if national accountants have no choice but to rely on business accounting records to estimate goodwill figures in national accounts, it should be understood that the figures will be highly

volatile and country-to-country comparability may be quite doubtful.

In any case, the 2008 SNA stipulates the use of an amortisation rule together with an impairment test approach. While the scope of asset items over which the impairment test should be applied is not clear in the above paragraph, a possible criticism against the treatment may be that some elements of internally generated goodwill could be mixed up in the measure because the futuresale value may include them.

3.5. Costs of ownership transfer

This point is related to costs associated with the acquisition (disposal) of goodwill. Of course, in the SNA, goodwill is one of the categories of non-financial non-produced assets, so that the costs of ownership transfer incurred with regard to the acquisition (disposal) of goodwill are treated as fixed capital formation. However, the acquisition (disposal) of goodwill can be done only through the acquisition (disposal) of a business, while the purchase of the business can be done by acquiring the controlling equity in it.

Because equity is in the list of liabilities in the SNA, the costs of ownership transfer involved with the acquisition (disposal) of equity are treated as intermediate consumption. For example, research costs (including fees paid to financial advisers) about the enterprise to be acquired may be incurred by the acquirer. Are they intermediate or final?

Japanese business accounting standards recently changed their position concerning the treatment of financial adviser’s fees. Previously, they were considered part of goodwill, but now they are regarded as current outgoings.

4. How you can do without the concept of goodwill

4.1. How to record business acquisitions

Regardless of whether the business is incorporated or not, the fact that it is sold, tells us that it can be deemed to be at least a quasi-corporate if not a fully

incorporated entity.

However, in practice, it is perfectly possible that the business (to be sold) is just part of a household, previously. In such cases, it is necessary for the busi-

ness in question to be reclassified to the corporate sector (from the household sector) prior to the sale/purchase. It is assumed that the household sector now has equity in the quasi-corporate. The equity in question must be introduced into the system via the other changes in the volume of assets account, as an economic appearance of financial assets/liabilities (assets of the household, liabilities of the quasi-corporate). Then, when a business acquisition occurs, the sale/purchase of the equity of the business is recorded. The value of the equity in question depends on the purchase price of the business that was formerly part of a household.

After the acquisition, the business is merged into the acquiring corporation; therefore the equity will disappear because the issuer of the particular liabilities is merged with the holder of it. The share price of the acquiring entity and hence net worth

(national accounting concept) of the corporation may increase or decrease depending on the market evaluation of the acquisition. It seems that there is no room for the entry of goodwill.

4.2. T-form presentations relating to purchased goodwill, internally generated goodwill and net worth

Table 1a shows the balance sheet of the business to be acquired by using national accounting concepts. Suppose that the business to be acquired has not experienced any acquisition before, and the purchase price of the business is the transaction value of its shares outstanding. In the table, this value is shown as equity⁽¹⁸⁾. The same situation is shown differently in Table 1b.

Table 1a: The balance sheet of the business to be acquired (by using national accounting concepts only)

Assets	Liabilities other than equity Equity Net worth
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Note: The business to be acquired has never experienced acquisition so that assets on the left-hand side do not include goodwill.

Table 1b: An alternative presentation of the balance sheet of the business to be acquired (with net worth as a business accounting concept)

(-) Net worth = Goodwill (to be recorded in the acquirer's accounts)	Equity (-) Net worth (*)
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Note: Purchased goodwill to be recorded in the account of acquiring business equals to (-) Net worth (national accounting concept) of the business to be acquired.

Let us suppose that an enterprise experienced acquisition once in the past. Goodwill was recorded then and has been written down at a certain previously-determined rate until now.

Tables 2a-d show the balance sheet of the enterprise in four different ways. Table 2a is a national accounting presentation of the situation, even though

the tangible-intangible distinction that you may find appearing on the debit side of the accounts⁽¹⁹⁾ almost ceased to exist in the 2008 SNA. In Table 2b, net worth is defined in the fashion of business ac-

⁽¹⁸⁾ In the T-forms in this section, asterisk (*) denotes that the item is a business accounting concept.

⁽¹⁹⁾ Computer software should be deemed to be tangible except for certain development costs. See Sakuma (2013) (pp. 564–65).

counting. In Table 2c, the situation involves the write-up of internally generated goodwill. In Table 2d, the same situation as Table 2c is presented in a somewhat different way.

Table 2a: The balance sheet of the acquiring business some years later (by using national accounting concepts only)

Tangible assets	Liabilities other than equity
Intangible assets other than goodwill	Equity
Purchased goodwill	Net worth

Note: A close relationship between purchased goodwill and net worth that existed at the time of the acquisition is not retained because of amortisation.

Table 2b: The balance sheet of the acquiring business some years later (by using a business accounting concept of net worth)

Tangible assets	Liabilities other than equity
Intangible assets other than goodwill	Net worth (*)
Purchased goodwill	

Note: The lack of equity data in the account makes business accounts less informative.

Table 2c: The situation involving the write-up of internally generated goodwill

Tangible assets	Liabilities other than equity
Intangible assets other than goodwill	Net worth (*)
Purchased goodwill	
Internally generated goodwill	

Note: The write-up of internally generated goodwill may make the business accounting concept of net worth less useful.

Table 2d: A presentation using national accounting concept of net worth

Tangible assets	Liabilities other than equity
Intangible assets other than goodwill	Equity
(-) Net worth	
(Purchased goodwill)	
(Internally generated goodwill)	

Note: Net worth that appears with the reversed sign on the left-hand side of the account is defined in a national accounting fashion, but the list of assets excludes purchased goodwill as well as internally generated goodwill. This form of presentation is somewhat similar to 'market capitalisation statement' in Bloom (2008).

From the presentations above, it may be concluded that it is quite difficult to measure purchased goodwill over time separately from internally generated goodwill. A particular business acquisition brings about a particular synergy which is subject to change over time. This cannot be estimated independently from synergy newly created after the acquisition. Thus, goodwill evidenced by a business combination will be inevitably mixed up with internally generated goodwill. It is net worth, (as a national accounting concept) not purchased goodwill, that is meaningful.

As already shown, business acquisition may be accounted for more naturally by regarding business acquisition as the purchase of equity rather than the acquisition of goodwill. An interpretation may be that purchased goodwill is, after all, just a token that shows the entity experienced a business acquisition in the past.

In addition to inconsistencies brought into the system as already mentioned, by considering practical difficulties about using business accounting data to estimate comparable figures for goodwill (and marketing assets), this author would like to propose to end the use of the concept.

4.3. Tobin's Q from the viewpoint of synergy

James Tobin, Nobel laureate in Economics, devised a ratio called Tobin's Q, which may be defined as:

$$\frac{\text{the market value of the firm}}{\text{the replacement value of the firm's assets}}$$

Here, the market value of the firm means the total market value of its shares and other equity and the firm's assets should be understood to be its net worth as a business accounting concept. The original formulation of Tobin's Q may be found in Tobin (1969). Although a prevalent adjustment-cost type of interpretations of the Q theory may be found in Yoshikawa (1980) and Hayashi (1982) among others, his own account of Tobin's Q may be found in an interview with *The Region*, a periodical issued by the Federal Reserve Bank of Minneapolis ⁽²⁰⁾:

⁽²⁰⁾ Tobin (1996).

'The idea is to think about the productive, physical assets of a company — maybe people think of it as book value of a company — but convert that into the replacement cost of the assets, not the original cost. How much would it cost to buy the assets again, new, off the production line? So, that's one valuation of the firm.

Looking at it that way, then, there's the market valuation, and one way of having a market valuation would be to have used capital goods markets — used car markets or used house markets. But for many things that's not a practical matter, so we have a used business market implicit in securities markets, stock and bond markets. And that's the ratio. The replacement costs are the denominator, the securities market valuations are the numerator.

Now, you might think that the value of this should be 1, that arbitrage would keep the two valuations the same. If people have a choice, they either buy new, build a new plant or buy another firm that already has a plant, in the securities market. That's arbitrage. Now, of course, there are going to be deviations from 1, obviously, even if the measurements were precise, which they're not — there would be deviations from 1 because of goodwill or monopoly value or things like that. But at any rate, it is possible to estimate this number on an aggregated basis as well as on a disaggregated basis.'

Tobin's Q, as a theory of the investment behaviour of a firm, may be most easily understandable by reading the paragraphs cited from Schmalenbach (1959) again. According to this citation, tying up the assets makes synergism. If a positive synergy is generated, investment in these assets may bring gains to investors. Thus, the fact that Tobin's Q > 1 may be regarded as a stimulus to investment ⁽²¹⁾. In fact, *by deleting goodwill from the asset list if necessary,*

$$\text{Tobin's } Q = \frac{\text{Equity}}{\text{Assets} - \text{Liabilities other than equity}} > 1 \text{ or } < 1$$

is equivalent to

(-) Net worth > 0 or < 0.

⁽²¹⁾ About the Q-theory of mergers, see Jovanovic and Rousseau (2002), for example.

Noteworthy may be the fact that Tobin suggested goodwill and intangibles may be regarded as disturbing factors to the functioning mechanism of Tobin's Q. In fact, in following the cited paragraphs above, he wrote:

'Now, it is true that there may be a change in the ratio between goodwill, human capital, things that are not in the commodity market, that are the basis for the valuation of firms — like Microsoft. Microsoft is not being valued at what it is now because of bricks and mortar and even chips-microprocessors. It is being valued as it is now because it has a kind of monopoly lead based on its ability to keep innovating and to have its hands on human capital of a superior kind — an organization of a superior kind. So, if that's the case, then the 'q' ratio, which requires a replacement cost calculation in the denominator, is not going to

be very informative for telling you about Microsoft. If more of the economy is like that, it's going to be different from what it used to be.'

Because intangibles including intangible assets (human capital, copyrights and so on) and tangible assets (machines, farm land, factories, computer software) have different positions in the production process of the firm that ties up these assets, they should be differently treated in the calculation of Tobin's Q. For example, deducting the value of intangibles as well as goodwill from the numerator and denominator may be one possibility. That is, modified Tobin's Q may be defined as follows:

$$\text{Modified Tobin's } Q = \frac{\text{Equity} - \text{the value of intangibles}}{\text{Assets less intangibles} - \text{Liabilities other than equity}}$$

5. Conclusions and proposals

Conclusions are as follows:

- (1) While there have been different views on goodwill, the synergy viewpoint may be most persuasive.
- (2) The concept of goodwill is not necessary for national accountants and goodwill should be excluded from the list of assets.

- (3) Business acquisition can be dealt with and analysed not by using the concept of goodwill, but by using equity (market capitalisation) and net worth as a national accounting concept.

In addition, the present paper showed:

- (5) There is a very interesting relationship between net worth as a national accounting concept and Tobin's Q.

Acknowledgements

This paper was originally prepared for the 33rd General Conference of the International Association for Research in Income and Wealth, Rotterdam, the Netherlands, August 24–30, 2014. Among his many debts, the author is grateful to Erich Oltmanns, who discussed the paper at the conference, as well as Peter van de Ven, André Vanoli, and Albert Braakmann, who gave valuable comments. In addition, he is deeply grateful to Aki Yamauchi; discussions with her on the business accounting treatment of goodwill was of great help for him to improve the previous version of the paper. This work was supported by JSPS KAKENHI Grant Number 24530233.

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A 3-way ANOVA a priori test for common seasonal patterns and its application to direct versus indirect methods

4

Enrico Infante ⁽¹⁾, Dario Buono ⁽²⁾
and Adriana Buono ⁽³⁾

Abstract: In this paper we propose a new a priori test to be used for the identification of a common seasonal pattern. The test is applied a priori to any running of a seasonal adjustment procedure. The test is a three way ANOVA, where the three factors are the series, the time frequency and the year. One of the possible applications of using such a test would be when selecting either the direct or indirect approach when seasonally adjusting. The Seasonally Adjusted series of an aggregate can be obtained by seasonal adjusting it (direct approach) or by aggregating the seasonally adjusted individual series (indirect approach). It should be noted that, to-date, the literature has been mainly focusing on an a posteriori comparison among the results achieved by applying different approaches. This paper seeks to set out an a priori strategy for the identification of the most effective seasonal adjustment of the aggregate.

JEL codes: C32, C43

Keywords: Seasonal adjustment; ANOVA; direct vs. indirect approach; moving seasonality; common seasonal pattern.

⁽¹⁾ Eurostat, unit C1: 'National Accounts methodology. Sector accounts. Financial indicators', Università degli Studi di Napoli Federico II, Department of Economics and Statistics.

⁽²⁾ Eurostat, unit B1: 'Methodology and Corporate Architecture'.

⁽³⁾ Università del Sannio, Department of Biological and Environmental Sciences.

1. Introduction

An aggregated time series Y_t can be expressed as follows:

$$(1) \quad Y_t = f(X_{1t}, \dots, X_{kt}, \dots, X_{St})$$

A special case is when f is an additive function, which can be generalized as follows:

$$(2) \quad Y_t = \omega_1 X_{1t} + \dots + \omega_k X_{kt} + \dots + \omega_S X_{St} = \sum_{k=1}^S \omega_k X_{kt}$$

Where $\omega_1, \dots, \omega_k$ are general weights.

An example of this kind of aggregate is the European Union GDP, which is the sum of the GDPs of the 28 EU countries.

Seasonal adjustment is a well-known topic that has been studied a lot in recent years (see, for example, Granger, 1979). Amongst others, two methods that are systematically used in Eurostat and in the various National Statistical Institutes (NSIs) of the European Union countries are: the model-based approach (TRAMO/SEATS, see Maravall and Perez (2011), or Gómez and Maravall (2001)) and the

filter-based approach (X11 family, see, for instance, Findley and Hood (1999), or Findley (2005)). For a practical analysis, consult Buono (2005) or Ghysels and Osborn (2001).

The aim of this paper is to propose a new test, based on a three-way ANOVA model, which aims at identifying whether disparate series present a common seasonal pattern. The main advantage of this test is that it gives information about which series have a common seasonal pattern before seasonally adjusting the series, so that it can be considered as an a priori method. A first elaboration of this idea is in Buono and Infante (2012). The need for such a test is also stated in Cristadoro and Sabbatini (2000).

Section 2 presents the new test. Section 3 presents its potential applications. Sections 4 and 5 include a simulation and a case study, respectively. Section 6 provides an assessment of the power of the test while section 7 indicates suggestions for future research.

2. The new test

The classical test for moving seasonality (Higginson (1975)) is based on a two-way ANOVA model, where the two factors are the time frequency (usually months or quarters) and the years, respectively. A Bartlett-type test for moving seasonality has been proposed by Surtradhhar and Dagum (1998). In order to test the presence of moving seasonality between different series (not between the years of the same series, as established by the classical moving seasonality test), we propose the use of a new test which is based on a three-way ANOVA model (see Cohen (2007)). The three factors are the time frequency, the years and the series.

The test variable in the classical test for moving seasonality is the final estimate of the unmodified Seasonal-Irregular differences absolute value (the Seasonal-Irregular ratios series is presented in the output table D8 of the tool X-12 ARIMA), if the de-

composition model is an additive one; or the absolute value of the Seasonal-Irregular ratio minus one, if the decomposition model is a multiplicative one.

As the test needs to be performed a priori (e.g. before running a seasonal adjustment procedure), it is not possible to use the Seasonal-Irregular differences (or ratios), as used in the test for moving seasonality. Thus, to create the trend series T_{kt}^{HP} , a Hodrick-Prescott filter is applied to each series X_{kt} . Such a filter is widely used, especially for macroeconomic series, and it seems to be the most appropriate for trend estimation when dealing with these kinds of series (see Hodrick and Prescott (1997), and Harvey and Trimbur (2008)). Other trend estimation methods may be applied for different types of series.

Thus it is possible to calculate the variable by subtracting the trend series from the original one:

$$(3) \quad SI_{ijk} = X_{ijk} - T_{ijk}^{HP}$$

We keep the notation *SI* to highlight the fact that it is a de-trended series. As such, the test variable is a three-dimensional array (cube), where in rows there is the *i*-th time frequency, in columns there is the *j*-th year, and in depth there is the *k*-th series.

As the series involved in the test can be added up before or after the seasonal adjustment procedure, it is evident that they must have the same scale.

The test is performed only on the part of the time series that covers all the observations of entire years.

The model is specified as follows:

$$(4) \quad SI_{ijk} = a_i + b_j + c_k + e_{ijk}$$

This equation implies that the value SI_{ijk} represents the sum of:

- A term a_i , $i = 1, \dots, M$, representing the numerical contribution due to the effect of the *i*-th time frequency (usually $M = 12$, for monthly series, or $M = 4$, for quarterly series);
- A term b_j , $j = 1, \dots, N$, representing the numerical contribution due to the effect of the *j*-th year;
- A term c_k , $k = 1, \dots, S$, representing the numerical contribution due to the effect of the *k*-th series of the aggregate;
- A residual component term e_{ijk} , assumed to be normally distributed with zero mean, constant variance and zero covariance. It represents the effect, on the values of the *SI* of the whole set of factors not explicitly taken into account in the model.

The test is based on the decomposition of the variance of the observations:

$$(5) \quad S^2 = S_M^2 + S_N^2 + S_S^2 + S_R^2$$

Denoting $\bar{x} = \frac{1}{MNS} \sum_{i=1}^M \sum_{j=1}^N \sum_{k=1}^S |SI_{ijk}|$ the general mean,

$\bar{x}_{i..} = \frac{1}{NS} \sum_{j=1}^N \sum_{k=1}^S |SI_{ijk}|$ the *M* time frequency means,

$\bar{x}_{.j.} = \frac{1}{MS} \sum_{i=1}^M \sum_{k=1}^S |SI_{ijk}|$ the *N* yearly means and

$\bar{x}_{..k} = \frac{1}{MN} \sum_{i=1}^M \sum_{j=1}^N |SI_{ijk}|$ the *S* series means, then we

can compute:

- $S_M^2 = \frac{NS}{M-1} \sum_{i=1}^M (\bar{x}_{i..} - \bar{x})^2$ is the between time frequencies variance. It is the effect that measures the magnitude of the seasonality.
- $S_N^2 = \frac{MS}{N-1} \sum_{j=1}^N (\bar{x}_{.j.} - \bar{x})^2$ is the between years variance. It is the effect that measures the movement of the seasonality in the same series.
- $S_S^2 = \frac{MN}{S-1} \sum_{k=1}^S (\bar{x}_{..k} - \bar{x})^2$ is the between series variance. It is the effect that measures the movement of the seasonality between different series.
- $S_R^2 = \frac{1}{(MNS-1) - (M-1) - (N-1) - (S-1)} \cdot \sum_{i=1}^M \sum_{j=1}^N \sum_{k=1}^S (|SI_{ijk}| - \bar{x}_{i..} - \bar{x}_{.j.} - \bar{x}_{..k} + 2\bar{x})^2$ is the residual variance.

Hence, the null hypothesis is the following:

$$(6) \quad H_0 : c_1 = c_2 = \dots = c_S$$

When H_0 is not rejected, it implies that there is no change in seasonality over the series, e.g. we cannot rule out the series have common similar seasonal patterns.

If the null hypothesis is true, the relative test statistic is required to follow a Fisher-Snedecor distribution with $(S - 1)$ and $(MNS - 1) - (M - 1) - (N - 1) - (S - 1)$ degrees of freedom and can be written as:

$$(7) \quad F = \frac{S_S^2}{S_R^2}$$

In the case that the null hypothesis is rejected, an option could be to run the test on sub-groups of the series, in order to discover which ones display similar seasonal movements. The use of cluster analysis

could also be explored in order to group these series which display common seasonal patterns. In any case, the number of series tested at the same time should not be too high.

3. Applications

One possible practical application of the test is to determine which approach to use for seasonal adjustment.

To obtain seasonally adjusted figures, at least two different approaches can be applied (see Mazzi et al. (2001a), (2001b), for more details):

- Direct approach: the seasonally adjusted data are computed directly by seasonally adjusting the aggregate Y_t .
- Indirect approach: the seasonally adjusted data are computed indirectly by seasonally adjusting data for each series X_{kt} . The seasonally adjusted Y_t is then given by the sum of these seasonally adjusted components.

A third option could be the mixed approach: if it is possible to define a criterion in order to separate the series into groups, creating sub-aggregates (e.g. these series have a common seasonal pattern), then it is possible to compute the seasonally adjusted figures by summing the seasonally adjusted data of these sub-aggregates.

The direct and indirect approaches have been discussed for many years, and there is no consensus on which is the best approach. See, for instance, Maravall (2006) or Hood and Findley (2001).

To date, many authors presented a posteriori analysis on the results of the different approaches. Consult, for example, Buš (2009), Hindrayanto (2004), Geweke (1979) or Otranto and Triacca (2000). For an overview of seasonality tests, refer to Busetti and Harvey (2003) and Rau (2006). As seasonal adjustment deals with unobserved components, the evaluation criteria of an a posteriori analysis depends on many factors (e.g. the method used) and could be a bit weak.

The main drawback to be considered, with regards to the direct approach, is that there is no accounting consistency between the aggregate and individual series. Another drawback of the direct approach is the directional inconsistency, as for some periods it could be that the components move in one direction while the aggregate moves in the opposite one. A controversial issue with the direct approach is the so called cancel-out effect: if there are two series with opposite patterns of seasonality, then the aggregated series will possibly show no seasonality, e.g. the aggregated series can show no seasonality even if all the individual series have seasonality. According to Maravall (2006), this is not a drawback.

However, the indirect approach also has some drawbacks. First of all, the presence of residual seasonality should always be carefully checked in all of the indirectly seasonally adjusted aggregates. In that case, applying an indirect approach means working with a larger number of series, hence the calculation burden could be quite large.

The numerical results obtained by performing the different approaches are usually close in terms of the medium and long term evolution of the series of interest, but they can still diverge in terms of the signs of the growth rates in the short term. They are likely to coincide if the aggregate is an algebraic sum, the decomposition model is additive, there are no outliers and the filter used is the same for all the series. These conditions are rarely met by a real data set.

According to the ESS guidelines on seasonal adjustment (Eurostat (2009)), if the series X_{kt} do not show similar seasonal patterns, indirect adjustment is preferred. Otherwise, if the series show common seasonal patterns and approximately the same tim-

ing in their peaks and troughs, the direct approach is preferred. In this case, the aggregation will produce a smoother series with no loss of information on the seasonal patterns. The direct approach is preferred for transparency and accuracy, while the indirect approach is preferred for consistency.

Rejecting the null hypothesis implies that the direct approach should be avoided and the indirect approach should be used. Once the sub-groups of the series, with common similar seasonal patterns are determined, a mixed approach could be used.

4. Simulation study

The purpose of the simulations (as a reference example, see Robinson (2004)) is to check whether the test is strong enough to be used systematically. It is a matter of fact that large organisations, such as Eurostat, deal with large data sets. In this context, the decision on the use of the direct or indirect method is taken prior to the production period, and it is usually maintained for some time. However, there are several cases where the decision to switch to the other approach is taken without an in-depth analysis of the characteristics of the specific data, and only considering the advantages of the selected approach. The simulations are executed for both monthly and quarterly series.

With regards to the monthly data, the test is performed on matrices composed of three series and a length of ten years. This means that, following the given notation, it will be $M = 12$, $N = 10$ and

$S = 3$. The most common time series model is the so-called airline model, such as $SARIMA(0,1,1)(0,1,1)$. Thus, each of the three series will follow an airline model, where the mean is set equal to 100, as Eurostat usually deals with index data. In addition, a residual term, normally distributed with zero mean and variance equal to one, is added to each series. The MA coefficients are between 0.5 and 1 in absolute value, so that the process is invertible and the coefficients are not too close to zero. Such coefficients have been generated using a uniform distribution.

In order to simulate the seasonal peaks, three different groups have been created. In each group (named A, B and C), a different seasonality scheme is used, as shown in Table 1. Each group represents a case of common seasonal patterns.

Table 1: Groups with different seasonality schemes for simulations – monthly series

Groups	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	-15	-6	+7	0	+10	+8	+16	-36	+7	+12	+6	-9
B	-30	-25	-14	-16	-4	+14	-3	+12	+14	+16	+13	+23
C	-11	-2	+13	+5	+6	+16	-44	+2	+18	+16	+2	-21

By means of this template, expectations are that when the test is performed on the series of the same group, then the p value is high and the F-ratio is low, so that the null hypothesis is accepted. Alternatively, when the IB test is performed on a series of different groups, then the p value is low and the F-ratio is high, so that the null hypothesis is rejected.

The simulations are executed on all the combinations of the three groups. For each combination the test is performed 1000 times on the simulated se-

ries. For each combination, Table 2 reports the average F-ratio, the bands of the confidence intervals on the average of the F-ratio and the number of times the null hypothesis has been accepted at 90 % and at 95 % accuracy. For a better understanding of Table 2, under the conditions explained above, it should be noted that the threshold values of the F-ratio for accepting the null hypothesis at 90 % and at 95 %, are 2.3184 and 3.0225, respectively.

Table 2: Results of simulations with different combinations of monthly series

Combinations	F-ratio average	F-ratio lower band	F-ratio upper band	No. H_0 accepted p value > 0.10	No. H_0 accepted p value > 0.05
AAA	0.8534	0.8023	0.9045	919	951
BBB	0.4399	0.4047	0.4751	985	995
CCC	0.9368	0.8867	0.9869	923	957
ABC	5.7001	5.6503	5.7499	0	2
AAB	14.019	13.889	14.149	0	0
ABB	13.256	13.176	13.336	0	0
AAC	3.1257	3.0892	3.1622	46	394
ACC	3.3128	3.2777	3.3479	52	385
BBC	7.1359	7.0860	7.1858	0	0
BCC	5.4890	5.4434	5.5346	0	1

In the first three combinations, the test works well. As expected, it shows that a direct approach is a better solution. The F-ratio is always much lower than the threshold values.

The results of the simulations with all the three different groups are also good. As there are three different seasonality schemes, the indirect approach is preferred. The F-ratio is higher than the threshold values.

With regards to the other combinations, the test works well when the schemes involved are A and B or B and C. For the combinations that involve groups A and C, the test experiences some difficul-

ties when considering a 95 % significance. This is mainly because groups A and C are not so different: except for the two summer months, they always have the same sign. For this reason, we recommend use of a 90 % significance, as is usually done for the moving seasonality test.

Regarding the quarterly data, the test is performed on matrices composed of three series and a length of ten years. This means that following the given notation, it will be $M = 4$, $N = 10$ and $S = 3$. The series are treated as before. Thus each series follows an airline (invertible) model, with mean equal to 100 and added by a residual term. The schemes for creating the seasonal peaks are shown in Table 3.

Table 3: Groups with different seasonality schemes for simulations — quarterly series

Groups	Qrt1	Qrt2	Qrt3	Qrt4
A	-4	+6	-5	+3
B	-23	-1	+8	+16
C	+3	+9	-8	-4

As for the monthly series, the IB test is performed 1000 times on the simulated series for each combination. The results are shown in Table 4. For a better understanding of Table 4, under the condi-

tions explained above, it should be noted that, the threshold values of the F-ratio for accepting the null hypothesis at 90 % and 95 %, are 2.3538 and 3.0829, respectively.

Table 4: Results of simulations with different combinations of quarterly series

Combinations	F-ratio average	F-ratio lower band	F-ratio upper band	No. H_0 accepted p value > 0.10	No. H_0 accepted p value > 0.05
AAA	0.5411	0.5072	0.5750	981	989
BBB	0.3989	0.3677	0.4301	996	999
CCC	0.6813	0.6356	0.7270	962	989
ABC	23.811	23.712	23.910	0	0
AAB	33.189	33.020	33.358	0	0
ABB	35.611	35.536	35.686	0	0
AAC	9.0147	8.9188	9.1106	3	19
ACC	8.9591	8.7228	9.1954	2	17
BBC	16.048	15.947	16.150	0	0
BCC	8.8964	8.6377	9.1511	2	18

In all the different combinations, the test performs well by not rejecting the null hypothesis for the combinations with the series of the same group,

and rejecting it for the combinations with the series from different groups.

5. Case Study

A real data example is used to illustrate the proposed test. The data, from Eurostat (<http://ec.europa.eu/eurostat/data/database>, extracted September 2012), consist of the quarterly national accounts aggregates by branch. We considered the aggregates of the Eu-

ropean big four (France, Germany, Italy and Spain) for two branches: agriculture, forestry and fishing; industry (excluding construction). The time span is from 2001 to 2011 and the series are quarterly. The results of the test are reported in Table 5.

Table 5: Results of the test for the big four (France, Germany, Italy and Spain)

Agriculture, forestry and fishing	df	Sum Sq.	Mean Sq.	Industry (excluding construction)	df	Sum Sq.	Mean Sq.
Time freq.	3	2907	969.1	Time freq.	3	55.90	18.635
Year	10	374	37.4	Year	10	513.71	51.371
Series	3	40884	13628.1	Series	3	19.38	6.459
Residual	159	12237	77.0	Residual	159	1212.98	7.629
F-ratio = 177.0747		p value = 0.0000		F-ratio = 0.8466		p value = 0.4703	

For the series on agriculture, forestry and fishing, the F-ratio is very high, and consequently the p value is very low. This means that the series do not display a common similar seasonal pattern, as the null hypothesis is rejected. When adjusting the big four's aggregate, the indirect approach is recommended.

In the case of industry (excluding construction), the F-ratio is low. Consequently the p value is higher than 0.1 and the null hypothesis is accepted. The se-

ries display a common seasonal pattern and therefore a direct approach is preferred when seasonally adjusting the aggregate.

As shown in the tables, the results of the test are quite easy to read, and the test is based on a well-known model. It should be remarked that no seasonal adjustment procedure has been performed, as the test is a priori.

6. Test power analysis

A graphical power analysis has been conducted for the test by using the tool G*Power 3 (see Faul et al. (2009), and Faul et al. (2007)). Power is defined as the conditional probability that one will reject the null hypothesis, given that the null hypothesis is not true.

The analysis has been conducted setting $\alpha = 0.05$, and by varying the series factor (2, 4 or 6), the time frequency factor (4 or 12) and the years factor (5 or 10).

In some cases, the various combinations of the factors have different results. It may be trivial to note, but the power is higher when dealing with a monthly series. It is evident from the charts in Figure 1 that the power is very high when the monthly series

cover a span of 10 years (always higher than 0.97), and it is lower than 0.90 when there are just two series that have a time span of 5 years (this is anyway an extreme case). The case of dealing with quarterly data is more problematic. It is clear that the power is very low when the time span is 5 years (too few observations), but it is low even when the series cover a span of 10 years and the number of the series is also low (2 or even 4).

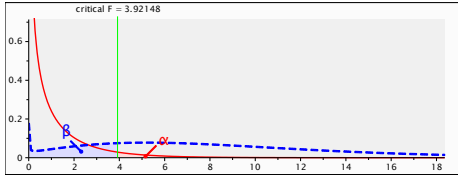
The main result of such an investigation is that power is generally high when using monthly data; more years are required in order to perform well, when quarterly data are used, given the small number of observations and the reduced number of series.

7. Future research

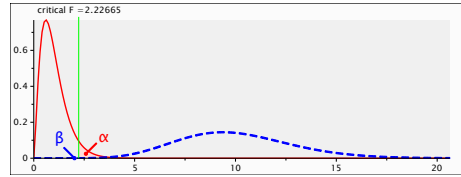
The research included in this paper should be extended to include ideally:

- Large scale applications: there is a need of practical feedback on the test's performance. An application on real time series is already on-going; considering different fields for which the approach used is checked by using the test;
- Seasonal co-movements test (Centoni and Cubbadda (2011)): for benchmarking reasons, the seasonal co-movements test could be used. Such a test could assess whether the test presented here detects well the seasonal movements of the different time series;
- The use of a different filter for trend estimation could be explored. In particular the selection of the parameter λ could follow different methodologies (see for example Maravall and del Río (2001));
- The assumptions made on the residual term of the equation (4) could be tested. The test is only valid under these assumptions.
- Outliers: a detailed study on how the presence of outliers impacts on the test performance. In seasonal adjustment, usually three different kinds of outliers are considered: the Additive Outlier (AO), the Transitory Change (TC) and the Level Shift (LS). It may be interesting to see how the test would react when one or more outliers are present in one or more time series, and how the different outliers (and their combinations) would impact the results of the test;
- JDemetra+: in order to facilitate the use of the test, it could be added as a module to the upcoming Java version of the software Demetra+. JDemetra+ is the new open source software for seasonal adjustment (in essence, a JAVA version of X13 ARIMA-SEATS and TRAMO/SEATS) developed by the National Bank of Belgium in cooperation with Eurostat that has an open set of Java libraries that can also be added to the standard developed libraries. Having the test as a new library in the software may also help the users in choosing between direct and indirect approach in a user-friendly way.

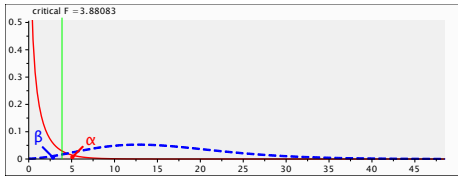
Figure 1: Power analysis varying series, time frequency and year factors



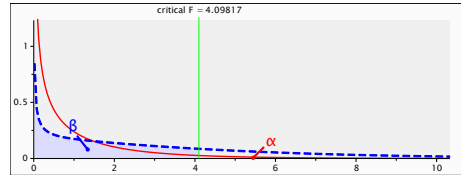
Monthly, 5 years, 2 series, Power = 0.7752659



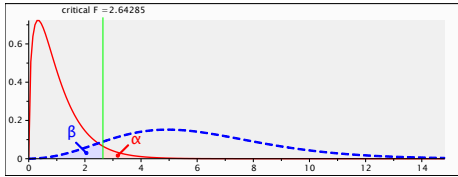
Monthly, 10 years, 6 series, Power = 0.9999199



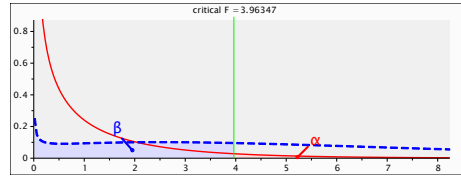
Monthly, 10 years, 2 series, Power = 0.9711088



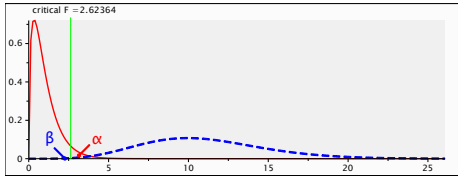
Quarterly, 5 years, 2 series, Power = 0.3379390



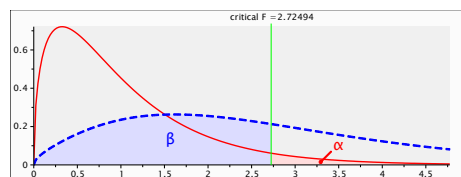
Monthly, 5 years, 4 series, Power = 0.9122391



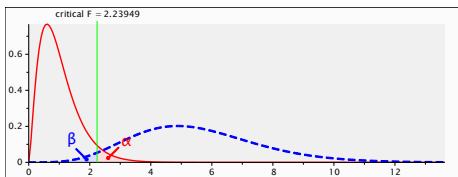
Quarterly, 10 years, 2 series, Power = 0.5981469



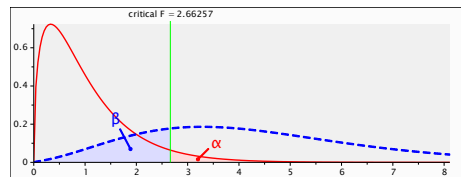
Monthly, 10 years, 4 series, Power = 0.9982151



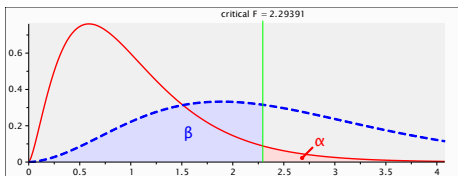
Quarterly, 5 years, 4 series, Power = 0.4203901



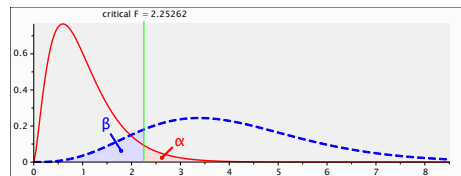
Monthly, 5 years, 6 series, Power = 0.9705043



Quarterly, 10 years, 4 series, Power = 0.7494045



Quarterly, 5 years, 6 series, Power = 0.5102894



Quarterly, 10 years, 6 series, Power = 0.8572074

Acknowledgements

We would like to acknowledge Robert Kirchner for his comments on how to build the test and the idea of the cube; Agustín Maravall for his comments on the direct and indirect approach; and Gian Luigi Mazzi, Roberto Barcellan, Carlo Drago, Riccardo Gatto, Jean Palate, David Stephen Pollock, and Germana Scepti for commenting on earlier versions of this paper. A special thank you also goes to the two blind peer reviewers for providing encouraging feedback. We are also grateful to Josephine Camilleri for proofreading the English.

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