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THE FUTURE OF THE SNA IN A BROAD INFORMATION SYSTEM PERSPECTIVE

by Andre Vanoli*

Association de Comptabilité Nationale

In this article, three questions are considered in relation to the general issue raised by the title of the IARIW-OECD Conference on the "Future of National Accounts: W(h)ither the SNA". Firstly, often so much is expected from the System of National Accounts (SNA) that a crucial clarification is needed as to the possible ambitions which can be assigned in the future to it in terms of extension of its coverage. More precisely, my query concerns the integrated "central framework" of the SNA. Secondly, I ask some questions about the revision strategy of the central framework. Thirdly, taking stock of my previous conclusions, I would like to briefly specify the position of what I propose to call the "System of National Economic Accounts" (SNEA), in a broad information system's perspective that distinguishes four spheres, the Economy, Nature, People and Society.

Part I. Basic and Priority Issues about the Relationship Between the SNA Central Framework's Economic Accounting and an Inclusive Wealth Accounting System, more Specifically a Hypothetical full Scale Ecosystem Accounting

At the start of this paper, issues concerning the SNA integrated central framework will be dwelt upon. The expression "integrated central framework" is perhaps not that familiar to many people, though it has been introduced in the 1993 SNA (see chapter II, section E. The integrated central framework and flexibility; chapter XIX. Application of the integrated framework to various circumstances and needs; and chapter XXI. Satellite analysis and accounts, section A. Introduction). Chapter II of the 1993 SNA also uses the expression "integrated economic accounts" for a synthetic presentation of the sequence of accounts. Some people call the central framework "core accounts," with more or less the same meaning. However, the term "central framework" or "integrated central framework" is more explicit and, in my view, should be used much more explicitly in the future. The concept itself probably needs some further elaboration.

In short, the central framework is notably characterized by the requirements of full integration and consistency, from a conceptual point of view (concepts, units and groups of units, definitions, classifications, accounting structure) as well as a valuation perspective. In particular, the flows and stocks that it includes are observed or estimated in terms of transaction values or near-by equivalents (the expression "market values" being traditionally used as a short cut). The meaning of the typical SNA aggregates is widely determined by the characteristics of the

*Correspondence to: Andre Vanoli, Association de Comptabilité Nationale c/o Insee, Timbre D110, INSEE - 88 avenue Verdier - CS 70058 - 92541 Montrouge cedex, France (andre.vanoli@insee.fr).

integrated central framework. For this reason "to be or not to be in the SNA central framework" is often considered essential in order to see the importance of certain issues, like environmental concerns, duly recognized. Thus a fundamental question, when reflecting on the future of the SNA, is to ask oneself how the coverage of the integrated central framework could possibly evolve.

In this respect the clarification that is strongly needed is about the relationship between the present SNA concept of economic wealth and the conceptual model of "inclusive" wealth (sometimes referred to as "extended" or "total" wealth) which economists have elaborated during the last half-century, generally in close connection with the analysis of sustainability thereby extensively referring to the Hicksian concept of income.

In terms of capital, the term inclusive wealth covers Produced or Economic capital (terminology may differ), Human capital, Social capital and Natural capital. All sources of human welfare/well-being should be included. Values of all assets are estimated by the present value of the future flows of services which they generate. Welfare/well-being is sustainable if, assuming the various types of wealth are substitutable, the change of total wealth per head is not negative. Limits to substitutability, resulting for instance from the existence of critical natural assets, obviously complicate the picture. In such an approach, one is tempted, as Martin L. Weitzman (1976) did, to justify an interpretation of net national product or income in terms of both welfare and sustainability, and to derive from it directions to be followed by national accounting.

Of course the idea that the wealth of nations is broader than economic wealth is not, as a matter of principle, debatable, even if there is room for discussion, for instance on the potential extension of the concept of wealth (what is the borderline?), or the terminology (is the term "capital" relevant in all cases, when in a number of instances a more neutral term such as "wealth" or, in French for example, "patrimoine," would be preferable?). What actually is in question here, is the feasibility and, consequently, the acceptability of directly integrating the inclusive wealth approach in the accounting structure, denominated as the "SNA central framework". This issue is indeed highly debatable. However, giving a sound, hopefully widely agreed upon, answer to this question seems to be a prerequisite of any reflection on the future of the SNA in a long term perspective. There seem to be two ways of formulating this big challenge facing the SNA central framework, a strong one and a less demanding one.

1.1. *The strong requirement case*

The strong requirement case can be formulated as follows: "Should/could the SNA central framework current estimates aim at delivering meaningful aggregates of sustainable welfare/well-being/quality of life (sustainable net product or income)?"

As far as I know, the most elaborated and influential answer to this question was provided by the Stiglitz, Sen, Fitoussi Commission's Report (2009) on the Measurement of Economic Performance and Social Progress. The Report concluded that:

1. Current well-being/quality of life (the report avoided to use the term welfare, frequently used in standard economic theory) is multi-dimensional; it is not possible to integrate all of the relevant dimensions in any adjusted national accounts aggregate in monetary value; focusing on sets of well-being indicators is unavoidable.
2. An essential distinction has to be made between means (they include resources in goods and services and various aspects of people's life circumstances, like health, social networks, quality of institutions, etc.) and well-being which is the result of the transformation of the whole set of available means. An implication of his crucial distinction is that typical SNA aggregates, such GDP, National Income or final consumption, belong to the field of means, not of the results in terms of measuring well-being.
3. Sustainability assessment requires projections based on very ambitious long-term modelling implying strong assumptions; the task "goes much beyond the normal job of statisticians and/or economists; entails prior responses to normative questions"; and thus "strongly differs from standard statistical activities" (p. 264 of the report).

Thus the conclusion of the Stiglitz, Sen, Fitoussi Commission as to what I labeled "the strong requirement case" in terms of measuring current well-being as well as sustainability was unambiguously: "no". In the context of the present collective reflection on the future of the SNA, one wonders whether there is any reason for revising this conclusion. I don't think so. Let's look now to the less demanding case.

1.2. *The weak requirement case*

The weak requirement case can be formulated as follows: "Should/could the SNA central framework be extended in order to fully integrate both current economic accounting and a possible current environmental (or more precisely current Nature's) accounting?"

Here, the term "current" means, in contrast with the above investigation of the strong requirement case, without aiming at measuring either comprehensive aggregates of well-being or sustainability aggregates in monetary terms. In this respect, it is wise to limit the issue at stake to Nature's accounting, more precisely to accounting for ecosystem assets and the ecosystem services they provide. In effect, most natural resources are already accounted for, as market resources, in current economic accounting. The treatment of the depletion of extracted natural resources, still unsatisfactory in the 2008 SNA, will most probably be changed in some years' time. The first volume of the SEEA 2012 includes a solution in which depletion is subtracted from net value added, to arrive at a "net value added adjusted for depletion," thus resulting in an equivalent lower value of net domestic product. The yet unresolved issue for the future SNA central framework is to choose between this SEEA 2012 solution, and a more radical one that would treat the amount of depletion as corresponding to the disposal (sale) of a slice of an asset, thus resulting in a lower value of GDP. Fully integrating, in the SNA central framework, ecosystem assets and ecosystem services is a much more complex

issue, because, in this case, hardly any information is available on the flows or stocks in transaction values or transaction equivalent values.

In spite of some decades of international discussions concerning environmental accounting, one can say that the question formulated above has been poorly investigated. It was SEEA 1993 that mostly dealt with the depletion of natural resources and the degradation of natural assets due to economic activities. Its purpose was the definition and estimation of a net domestic product adjusted for the environment. The degradation was to be valued following the maintenance costs approach. Thus the focus was on nature's assets. However, the implications of extending the costs of economic production in this way were not fully scrutinized. The main criticism that emerged from the debates[1] was that such an *ex post* static accounting adjustment was not consistent with the valuation principles of the SNA, and that modelling another economic equilibrium was necessary in order to take this change into consideration. As to the services provided by the natural environment, the SEEA 1993 concluded that taking them into account later on would need an extension of the concept of production of the economy.

SEEA 2003, though reviewing in depth many methodological issues concerning natural assets and their changes and various possible subsequent adjustments to national accounts aggregates, followed the 1993 version's orientation. It hardly paid any attention to possibly accounting for ecosystem services as such; it only looked at it when discussing valuation techniques for measuring degradation (chapter 9, Section C. Damage- and benefit-based pricing techniques).

In contrast with the two preceding versions, SEEA 2012 dedicated its second volume to a proposal for "experimental ecosystem accounting." What is proposed there is very ambitious. It covers accounts for ecosystem services and ecosystem assets in physical terms, accounts for ecosystem services and ecosystem assets in monetary terms. However, rather little attention is paid in this volume to the possible integration (or let's say "full" integration, to stress the meaning of this hypothesis) between the present economic accounting and the suggested ecosystem accounting. SEEA 2012 is obviously hesitating, and, it does not include any recommendation in this respect. Only a short section (6.4) is devoted to discussing the topic of "Integration of ecosystem accounts and economic accounts in monetary terms," with an Annex A6.1 on "Possible models for a sequence of accounts for ecosystem accounting." Among the issues discussed there, one can find the suggestion to expand the concept of production by incorporating the generation and use of ecosystem services. It is also suggested that the ecosystem degradation could be recorded similarly to what is proposed in the first volume for depletion, that is, as an additional adjustment to the "Depletion adjusted net domestic product" in order to get a "Degradation adjusted net domestic product" (see § A.6.4).[2]

[1]See for instance chapter 10. Making environmental adjustments to the flow accounts, in the SEEA 2003, notably paras 10.239 and 10.242. During the intense discussions which followed the SEEA 1993 publication, the issue was much further elaborated in Aaheim and Nyborg (1995).

[2]Note that in the SEEA 1993 a similar adjustment, estimated following the imputed maintenance cost approach, was not conditional on extending the concept of production to the generation of ecosystem services.

In the same annex A6.1, it is stated that "In aggregate the output of the economy rises by the full extent of ecosystem services, and GDP will rise to the extent that some of the ecosystem services are consumed as final consumption." Such a sentence may look as common sense. One wonders however what is behind the curtain. § A.6.3 explains: "Many ecosystem services will be indirectly included in measures of final consumption when they are used by enterprises in the production of standard SNA outputs (e.g. food, clothing, recreation)." This sentence echoes what is often written by economists trying to estimate the value of ecosystem services, in some cases at the world level (see for instance Costanza *et al*., 1997 and 2014), generally by types of services and types of ecosystem assets. All these scholars stress the point that one part (which they do not specify) of the services that they estimate is already "included in GDP as it is embedded in the contribution of natural capital to marketed goods and services" (Costanza *et al*., 2014, p. 157). However, if the existence of this kind of contributions is absolutely true, generally speaking, in physical terms, one cannot conclude from that evidence that those contributions are "included in GDP," which is an aggregate of transaction (or transaction equivalent) values.

In the same line of reasoning, one can frequently observe the suggestion that it would be necessary to "disentangle," from transaction values, the respective contributions of nature and the economy (labor and produced capital). Surprisingly, this issue was apparently never investigated thoroughly. One possible interpretation would be that it is necessary to distribute the present national accounts transaction values across their present components, duly reduced, *plus* one for Nature's (estimated) contribution. But this would assume that the present prices of the different products represent their "true" absolute values, which would mean that their relative prices today are their "true" relative prices, although the present price system attributes no value to the contributions of Nature.

Another approach would add to the present price of each product the (estimated) value of the ecosystem services attributable to the process of production of this product in order to get its "true" relative price. Such an approach however is not convenient for a system of "ex post" static accounting adjustments, as it would be unrealistic to assume the system of quantities to be left unchanged (the same kind of objection was met by the SEEA 1993 in its time). This leads to the conclusion that the full integration (merging) of ecosystem assets and their services in national economic accounts is not conceivable without large-scale modelling operations. Of course, the possible internalization of actually charged ecosystem services is a totally different issue.

There is nonetheless a stronger, radical objection to the feasibility of completely merging a possible accounting system for ecosystem assets and services with the system of economic accounts, which concerns the valuation issue. To be possibly merged, both sets of flows and stocks should be valued in a coherent way. As the valuation principle of the SNA central framework is in terms of transaction values, for other flows and stocks estimated "in monetary terms" to be integrated in the SNA central framework, it is necessary that their valuation could be interpreted as carried out in "equivalent transaction values." The problem is that the methods used for estimating the value of ecosystem services generate values which generally cannot be interpreted as "equivalent transaction values." What they provide are in most cases at best estimates of the willingness-to-pay, including consumer surplus, derived from

contingent valuation methods. Expressed in a traditional terminology, they are estimates of use-values, not of exchange values.[3] This issue is generally accepted, explicitly or implicitly (see the Costanza *et al*. papers or the various versions of the SEEA). The trouble is, however, that no general and clear conclusion is drawn from this established fact. Such a situation could be acceptable, on a provisional basis, if there would be a reasonable prospect of developing estimation methods that would provide equivalent transaction value estimates on a wide basis. However such an objective seems most probably out of reach, even if it can be considered realistic in some cases, and it seems unlikely that the objective can be reached, even with more time, more work, improved methodologies or stronger support by society at large.

Clearly, a much more fundamental issue seems be at stake. First of all, because of the magnitude of the problem. The global [use] value of ecosystem services was estimated by Costanza *et al*. at 33 trillion dollars in 1995, for year 1997, that is to say 1.8 times the global value of GNP at that time. According to another study which they quote in their 2014 article, this global [use] value was estimated, for year 2000, at 4.5 times the value of the world GNP. Of course this magnitude is not a problem as such. Secondly however, it implies that the valuation principle required, if one would like to fully integrate ecosystem accounts with economic accounts, should be applied in huge domains of ecological functions and services that are more and more distant from having (direct) relationships with actual economic transactions.

Anyway, if one would like to think seriously about the future of the SNA central framework, it seems rather urgent to clarify what could be, or perhaps what could not be, the expectations concerning a possible complete integration between (natural) ecosystem accounting and economic accounting. In this respect, it is interesting to notice the fact that the title of the SEEA 2012 is "System of Environmental—Economic Accounting," whereas both the 1993 and the 2003 versions were titled "Integrated Environmental and Economic Accounting." Is it purely by chance or does it reflect the existence of serious doubts about the feasibility of the previous objectives? Clarifying this issue is essential, not only for national accountants, statisticians and economists, but also for the scientific community at large, and more widely, various groups of the whole society.

If the answer to the question concerning what is called above "the weak requirement case" is "no," then it means that the integrated SNA central framework can only cover the accounts of the Economy in the current SNA sense. If there were an agreement on that, it would be advisable to adjust our terminology accordingly, in order to limit the risks of misunderstanding in the relations with the social community at large. The most suitable solution would be to slightly modify the title of the SNA. Instead of "System of National Accounts," it would become "System of National Economic Accounts, SNEA." Note that the expression "Economic Accounts" was sometimes (rather widely perhaps) used in the past, particularly during the 50s and 60s of the previous century. The first version (1970) of the ESA was called "European System of Integrated Economic Accounts—ESA." The title of the well-known book by Richard and Nancy Ruggles (1970) was "The Design of Economic Accounts."

[3]By the way, it appears that expressions like "measures in monetary units" or "in monetary terms" often used in this context are not equivalent to "measures in monetary value." A given unit of monetary value is a general equivalent of exchange values, not of use-value.

However, one wonders whether such a limitation of the SNEA coverage, as compared to the widely disseminated, at least implicit, much more ambitious objectives, means that nothing new about the relationship between the Economy and Nature could/would appear in the SNEA central framework. Not at all, but the focus would precisely be on certain very important relations, not on the whole bulk of ecosystem assets and services, whose full integration in the SNEA central framework in monetary value is simply considered as an objective out of reach.

Assuming that the treatment of the depletion of natural resources will be solvable in the near future, the proposal that I developed in recent years gives prominence to the recording of the degradation of ecosystem assets due to economic activities.[4] There are two basic justifications for this proposal. The first, more fundamental one is that the degradation of nature is the crucial phenomenon reducing the availability of ecosystem services and threatening the future of humankind. Beyond the debate on the exhaustion of natural resources, it is the degradation of natural assets due to economic activities which gave rise to the emergence and extension of the environmental concerns. The second reason, from an operational point of view, is that it is easier, though not simple at all, to try to estimate the value in equivalent transaction values (a condition for possible inclusion in the central framework) of the part of the ecosystem assets which is degraded during a given period of time instead of the whole bulk of these assets. Proximity with actual or potential degradation is generally a useful basis for physical measurement and for valuation.

I would like to summarise my proposal,[5] by first introducing some additional concepts. The "Unpaid ecological costs" represent the value, in terms of avoidance or restoration costs, of the degradation of ecosystem assets in a given period due to economic activities[6] (cf. the SEEA 1993 concept of "imputed maintenance

[4]Similar prominence to degradation was given by the 1993 SEEA, with similar valuation recommendations, but the accounting treatment followed was totally different. This issue is no longer central in the SEEA 2012.

[5]See also "Towards the Estimation of Final Demand at Total costs (paid economic costs *plus* unpaid ecological costs") in an Extended National Accounting Central Framework" (IARIW General Conference, August 2012). A more concise presentation, in French, can be found in «Vers un enrichissement des comptes de la Nation par la valorisation de l'évolution de l'état des actifs naturels (Coûts écologiques non payés, dette écologique, demande finale aux coûts totaux)» [Etudes et documents, n° 116, Octobre 2014, Commissariat général au développement durable, p.6–9]. Also in my presentation (in French too) at the 15 ème Colloque de l'Association de comptabilité nationale (Paris, 19–21 novembre 2014); see http://www.insee.fr/fr/insee-statistique-publique/default.asp?page=connaitre/colloques/acn/acn.htm.

[6]I stay at the global level of a closed economy in this short presentation. There are of course variants as to the possible ambitions of such an undertaking in real life. Ideally, at the end of the estimation process of unpaid ecological costs, these costs for a given economy should be cross-classified by types of natural assets, distinguishing domestic, foreign and global assets, and by types of products in resident final demand (and as a consequence possibly by groups of economic agents using them). Most likely the starting point of the process would be the estimate of the degradation of domestic ecosystem assets by type of assets and economic activities at the origin of the degradation. Then supply and use tables, analytical input-output tables and external transactions matrices should be used to derive the expected final picture. Global natural assets, like the climate, raise a specific issue. Their physical degradation, like the change in the world temperature, is estimated directly at the global level of the planet. In order to limit this degradation, objectives of greenhouse gas emissions limitations are defined or should be defined both at the global level and then consistently at the level of each country. The corresponding ecological costs should then be estimated for a given country by taking into account the actual evolution of its emissions as compared to the objective trajectory, and the unit costs of reducing the emissions (in short the carbon price). Then the manipulation of matrices would be operated as indicated above.

costs"). The "Ecological Debt" is the debt of the Economy towards Nature. Its stock results from the accumulation upon time of unpaid ecological costs. If, in one way or another, the Economy restores degraded ecosystem assets, the stock of ecological debt is reduced. Revaluation can also be necessary. The "Final demand at total costs" is equal to the sum of the Final demand at paid economic costs (i.e., the traditional SNA final demand) and the Unpaid ecological costs.

A specific extension of the accounting structure of the SNA central framework is worked out below. As a reminder: according to the previous conclusions of this paper, the SNA central framework is assumed to cover, in the future as it is today, only the accounts of the Economy. As a consequence, Nature is treated as an entity distinct from the Economy, located outside the Economy, contrary to the usually proposed representations which treat it as a part of the Economy, either as an additional sector or sub-sector or as additional type of economic assets. In the proposed accounting structure, an additional flow is introduced between Nature and the Economy. It consists of the value of the Unpaid ecological costs, corresponding to the degradation of ecosystem assets, as defined above.

In the accounts, the final demand of the Economy is recorded at total costs, showing its two components, i.e., final demand at paid economic costs and unpaid ecological costs. As the accounts of the Economy are, in other respects, unchanged (notably the income remains the same as in the current economic accounts), an amount of negative saving equal to the amount of unpaid ecological costs is generated. This element of negative saving is counterbalanced by the additional flow from Nature to the Economy referred to above, and corresponding to the value of the degradation of ecosystem assets. This flow is called in my previous papers "capital transfer from Nature to the Economy." However this wording is not optimal as the use of the term transfer is ambiguous in this context. It seems preferable to call it, in a more direct way, "Net degradation of ecosystem assets." In the balance sheet of the Economy, the stock of ecological debt reduces the net worth of the Economy. Though it is thus recorded similarly to a liability, it should not be merged with financial liabilities, because of its totally different meaning.

A simplified numerical example for a closed economy would look as follows:[7]

Assumptions: Gross National Income (GNI) = 1000 (equal to GDP); Final Consumption = 900; GFCF = 100; additional degradation (Unpaid Ecological Costs) = 50, of which 45 is allocated to FC and 5 to GFCF.

[7]A little more complex hypothetical numerical presentations can be found in the references given in foot-note 6.

Accounts of the Economy

GNI	1000
FC at paid economic costs	900
Unpaid ecological costs on FC	*45*
FC at total costs	945
GFCF at paid economic costs	100
Unpaid ecological costs on GFCF	*5*
GFCF at total costs	105
Negative saving of the Economy	*−50*
Net degradation of ecosystem assets	*50*
= change in the Ecological Debt of the Economy	

Correspondingly, a very partial representation of the Accounts of Nature can be provided:

Accounts of Nature (change in ecosystem assets)

Net degradation of ecosystem assets	*−50*
Change in the Ecological Debt of the Economy	*50*

In order to avoid possible misunderstanding, a cautionary comment is necessary. In the proposed treatment, the term "costs" is intensively used, particularly in the expression "Final demand at total costs." The recommendation for the valuation of the "Unpaid ecological costs" is the same as for the imputed maintenance costs of the main version of the SEEA 1993. However, in contrast with the SEEA 1993, the ecological costs here are not to be interpreted as additional costs of production. They correspond to a concept of responsibility towards Nature, reason why the concept of "ecological debt" is applied.

Furthermore, it should be noted that the proposed measurement of unpaid ecological costs does not provide an indicator of sustainability as such, although the global and specific (e.g., by type of product) ratios between total costs and paid economic costs for a given economy or the world economy at large would be a good indicator of the state of the relations between Economy and Nature. The evolution over time of the unpaid ecological costs and the ecological debt would deliver crucial messages to the various parts of Society.

The orientation proposed here, though far less ambitious than the complete combination of economic and ecosystem accounting, is not an easy one. The actual estimation of unpaid ecological costs (see foot-notes 6 and 7) implies an extended collection of information and a collaboration of many experts in different fields, such as natural scientists, economists, statisticians, national accountants, etc. It would necessitate coordinated efforts at the national and international level. Most probably an international programme, like the International Comparison Program (ICP) for the calculation of purchasing power parities (PPP), is necessary, at first aiming at a quinquennial periodicity, with certain countries possibly adopting a more frequent one (every year in the long run?).

Such a programme is conditional upon a better understanding of what is both significant and feasible, institutional long term initiatives, political support and continuity. This inevitably means trade-offs between various possible

objectives. From this point of view, one can only conclude that the present situation is not satisfactory. Looking at environmental accounting over the past two decades, I notice a lack of continuity, a dispersion of efforts, and the tendency to go ahead in new directions instead of progressively consolidating what looked promising, for instance in the fascinating, albeit too much embracing, SEEA 1993. What has been missing is a thorough reflection of the lessons learned from actual experiences.[8] This is partly due to changes in the concerns of Society, including environmental concerns. However, as compared to the expectations about environmental accounting at the beginning of the 90s, the actual achievements are rather disappointing.[9] Here, I should add that there are obviously uneasy problems of governance of the statistical system as a whole, to be addressed at the national, the international as well as the world level.

Part II. Adapting the SNA/SNEA to the Changes in the Economy and Central Framework Revision Policy

Having addressed the issues in part I above, I now would like to turn to some general issues related to the adaptation of the SNA, better called the SNEA, to the changes occurring over time in the economic environment itself. Here, one should keep in mind that, when speaking about the System of National Economic Accounts (SNEA), I intend to deal with the accounts of the Economy (Economy being used in the traditional SNA sense), not with economic accounts of Everything.

Undoubtedly, establishing the accounts of an economy has become more and more complex over time, certainly when compared to what it was 60–70 years ago. Of course the statistical data system has developed enormously since that time and, roughly speaking, kept pace with the economic evolution until, let's say, the end of the 80s. In parallel, the conceptual system of national accounting extended to a complete coverage of economic flows and stocks. In a way the SNA 1993 represented the quasi-final achievement of what had been dreamt about half a century before. However, building the accounts had to face bigger and bigger challenges. In addition, the knowledge of national accounting in the society nowadays seems rather poor as compared to what it was in the 70s and 80s.

It is not the purpose of this paper to review these challenges. For an outline, one can see "Part 2 - The present: big challenges ahead" of the paper that I published, Vanoli (2014), in EURONA 1/2014 "National Accounting at the beginning of the 21st century: Wherefrom? Where to?" (Part 1 is devoted to "History: great achievements"). For a more detailed review, see Van de Ven (2014). Schematically, the economic evolution in the past three decades resulted in increased difficulties

[8]In this respect, one should note the regrettable lack of a careful reflection, in a publicly available report, of the implementation attempts that followed the adoption of the SEEA 1993.

[9]To be clear, I do not undervalue what has been achieved as regards for example the environmental protection expenditures and other fields of the environmental information system. My regrets are related to the lack of progression on the core issue of hypothetical environmental accounting in an integrated SNA central framework itself, which is one of the most important issues when thinking to the future of the SNA.

for adequately observing and measuring many aspects of "real life." Some striking features are, for example, globalisation and the role of multinational enterprises, the extension of service activities in general and financial instruments and services in particular, the development of intangible assets through research and development (R&D) and other innovation processes, changes in various so-called "business models" due to new information and communication technologies, often in relation with apparently free deliveries of services etc. Moreover, many of these factors are interacting. Reviewing possible solutions to these difficulties goes beyond the scope of this paper. I would like to limit myself to some more general remarks concerning the SNA revision policy, mainly on the basis of the revision of the SNA 1993 that led to the current 2008 version.

1. *What future for such a major revision in the near decades?*

Some people may remember that during a short period of time after the adoption of the SNA 1993, the intention at the international level was twofold. Firstly, not to wait such a long time (25 years between the 1968 version and the 1993 one) before making some important changes, if needed. The typical one at that time was to treat R&D expenditures as gross fixed capital formation instead of current expenditures.[10] Nevertheless the idea was to limit such significant changes to a very small number. Secondly, some minor adaptations would be considered in order to take into account certain new features that were emerging, but not yet mature enough at the time of the preparation of the SNA 1993. The intention then was to introduce these few selected modifications in the SNA as soon as they would have been thoroughly reflected and generally accepted. If I remember correctly, this was actually done for changing some paragraphs in the 1993 version in relation to financial derivatives. That was all. Soon after, the intended procedure vanished and the community of national accountants embarked on a large, long lasting revision of the SNA 1993. About fifty issues were opened for discussion.

Of course all of this resulted in a number of very useful decisions concerning for instance R&D expenditures and assets, insurance transactions, and pensions. However, in my view, also two important regrettable decisions were taken and introduced in the SNA 2008: (i) the inclusion of expenditures on military weapons systems in gross fixed capital formation, and the weapon systems themselves in fixed assets; and (ii) the change in the principle for recording international trade flows from crossing the border, used by traditional trade statistics and the traditional SNA including the 1993 version, to the change in ownership criterion traditionally applied in the Balance of Payments Manual. The criterion of crossing the border had been accepted by the IMF for the SNA 1993 itself, thanks to the explicit assumption of an imputed change of ownership when necessary (for my views on these two issues, see EURONA 1/2014 pages 27–28 and 29–30 respectively).

[10]Regrettably, in the end this treatment was not adopted (it was abandoned during the last phase of the revision process) in the SNA 1993.

From these two controversial cases, I draw three conclusions:

(i) One should be very cautious before changing certain SNA rules that are followed for a long time. Continuity upon time is very useful as soon as a conceptual statistical body has reached maturity.

(ii) When a change of great magnitude and/or significance is contemplated, it is necessary to analyse deeply this change and its consequences on the system as a whole before a decision is taken.

(iii) Before making a change in the central framework itself, one should carefully examine if introducing an additional construct, like a satellite account or something similar, would be enough to solve the issue at stake.

The way the main challenges for the future development of national accounts are presented and discussed in section 5 of Van de Ven (2014) paper shows that people are conscious of the complexity of the new issues to be addressed. However one has to be very prudent in relation to certain changes that have been suggested in international discussions so far. For instance, I feel very reluctant to possibly eliminating from the SNA the establishment unit used in the input-output table, as included for discussion on the research agenda in the SNA 2008 (§ A4.21). In this respect, I was and I am not convinced by the alleged "change of emphasis from the physical view of input-output to an economic view." I was also surprised by the statements concerning input-output coefficients in § 14.42 of the SNA 2008 in relation with goods for processing ("They no longer represent the technological structure of an industrial process but an economic one"), or more generally in § 14.43 ("Interpreting input-output coefficients as representing the technological structure of an industry does not recognise the role of other factors . . .").

To me, it seems necessary to include various approaches in an extended input-output framework (product-by-product and industry-by industry matrices, technical and organisational viewpoints, regional aspects, etc.). I use here the expression "organisational view," which is admittedly not fully satisfactory, instead of "economic view" that seems to be underrating other views.[11] To the extent that regional accounts are concerned (employment for instance) and for certain types of observation and analysis (like data on pollution emissions) the establishment unit remains valid. In short, it is absolutely necessary to revisit the whole issue of the representation in economic accounting of "the production system," taking into account the new and complex features that came into existence during the past decades.

[11]The traditional formulation "technical coefficients" in input-output tables sometimes seems to be misinterpreted. The purpose of such tables is of course not to provide instructions for "do-it-yourself activities." Actually the more relevant formulation "technico-economic coefficients"was often used in practice, when teaching national accounting for instance (this is certainly what I did myself in a remote past), because they are not based on a pure technology of production approach, but depend also from many "organisational arrangements." To speak of "a physical view"concerning the input-output framework of the SNA is wrong. In addition, technological changes are an important issue in economic analysis and consequently in economic accounting.

2. *The crucial issue of the relationship in the SNA/SNEA Central Framework between observation and analysis*

A crucial issue can be raised in relation with the representation of the economic activities in national accounts. It concerns the relationship in the SNA/SNEA between observation and analysis, and behind this the fundamental question of the relationship between the SNA/SNEA and economic theory. This is a delicate intricate issue which raises difficulties for both national accountants and economists.

On the one hand, standard economic theory uses a conceptual framework which includes inter alia welfare (utility) and its maximisation, services of factors of production and a Hicksian concept of income which, applied to long term analysis, leads to a definition of income like sustainable income/welfare and to the extension of capital to any source of welfare/well-being. This conceptual framework includes a number of theoretical assumptions that are often at odds with "real life" circumstances. The more the time perspective of economic studies lengthens, the more the assumptions introduced get stronger, because of the necessity to simplify the picture when modelling. On the other hand, the purpose of national accounting is to represent and measure the current economic situation and its evolution, covering both flows and stocks. As far as stocks are covered, in principle their current valuation by economic agents is used, no matter how imperfect their expectations of the future may be.

There seems to be a rather general agreement now that national account aggregates can neither measure well-being nor sustainable income. The situation is however less clear on certain other issues, like the possible inclusion of the measurement of multifactor productivity in the production account of the central framework. I guess that it will become progressively generally admitted that the central framework of the national economic accounts cannot adopt solutions that rely on strong theoretical assumptions, like in this context competitive markets, constant returns to scale, etc., a set of assumptions which Hall (2001) has collectively termed the "zero-rent economy" which do not correspond to the real world which is a "nonzero-rent economy."

For the time being, there are conflicting views on this topic. A limited discussion on the issue at stake took place in the Review of Income and Wealth (December 2010) between myself (Vanoli, 2010) and three colleagues from the U.S. (Jorgenson, Landefeld and Nordhaus, 2010). My position is that multifactor productivity estimates (and growth accounting whose conceptual basis is similar) are analytical constructs depending on models and theoretical assumptions which are stronger than those than can be accepted and used in the SNA central framework. In 1998 I introduced the distinction between soft modelling and hard modelling in this respect (see Vanoli, 1998). Some people seem to have difficulties with such a distinction. For them, as soon as a certain amount of modelling (like for the estimate of consumption of fixed capital) is accepted, there is no reason to reject making a significant step further.

The clarification of the overall issue involved deserves an extended in-depth reflection. To avoid any misunderstanding, I think that both approaches, economic theory and research on one hand and national economic accounting on

the other hand, have their own rationale. Neither of them should be obliged to adopt the viewpoint of the other. One implication of such a conclusion is for instance that many economic studies will most probably continue to use a theoretical framework that includes a concept of welfare, conceived of as if it were actually computable in current macro-economic accounting, though it is not. However economists will hopefully recognise that such a concept cannot be followed in the macro-economic conceptual accounting framework designed for the SNA/SNEA.

More generally, it should be recognised that the SNA/SNEA adopts a certain representation of the economy that does not correspond entirely to either the general representations given by economic theory/theories, or the particular representations provided by, for example, business or government accounting standards. Differences may sometimes be based on conceptual reasons, sometimes on empirical considerations. Such a state of affairs may be considered quite uncomfortable. It is important to make this totally explicit to users and analysts.

A well-known interesting case in this respect is provided by the SNA concept of income which does not cover holding gains/losses. The Hicksian income concept tends to include them, though under certain conditions. Looking at past history, business accounting hesitated between including them in the measurement of profit, only when they are realised (in the context of historical cost recording), or as soon as they are potential (in the context of fair value recording). Financial account experts are increasingly interested in taking these gains or losses into consideration.

Covering realised holding gains in the SNA concept of income is both unfeasible in practice and incompatible with the general rule of recording assets and liabilities in the SNA balance-sheets. Covering only potential holding gains is a different issue, much more disputable. Of course, it should be made clear upfront that the possible inclusion of these gains/losses in the SNA income concept is a relevant question only for real holding gains/losses (i.e., changes in the value of assets beyond the change in the general level of prices). The latter should remind us that in principle the SNA/SNEA should only adopt rules that are relevant for any type of situation, like high or low inflation rates.

In reflecting upon this issue, we should also carefully investigate the reasons why the SNA historically adopted its current income concept. One reason was purely pragmatic. In the absence of balance sheets in the System and with very limited micro business accounts available, which moreover followed the historical cost rule of recording, it was simply not possible at all to integrate holding gains/losses in the measurement of income. The second, more substantial reason behind the SNA concept is the pre-eminence given to the concept of production when estimates moved from measures of national income to a full-fledged system of national accounts. The explicit distinction between produced and non-produced values was only introduced later on.

Whatever the case, the concerns about holding gains affecting economic behaviour are legitimate. In front of such a problem, the question is what to do. Reversing the traditional treatment and so incorporating holding gains in the SNA/SNEA income concept would not be advisable in terms of society's values (views can evidently differ in this respect), accounting structure (it would be

necessary either to include holding gains as a resource in the production account and/or the primary income distribution account, or to reorganise the sequence of accounts substantially), discontinuity of medium and long term series and most probably international comparisons (apart from practical issues concerning the feasibility of these estimates by many countries, real holding gains in real estate property raise a serious problem of interpretation at the international level).

Here, my suggestion would be to imagine a new accounting tool called "semi - integrated variants" (terminology to be determined). As regards the problem of holding gains and income, such a variant could consist in defining a complementary alternative income concept in the SNA/SNEA, like "income including holding gains/losses" (again terminology to be determined, what is important at this stage is to stress the absolute necessity to attribute different names to different notions). These alternative concepts should in principle be made explicitly visible in the System, but not incorporated in the integrated sequence of accounts. The accounting structure itself, with the important distinction between transactions and other flows, would not be modified. Such semi-integrated variants could be placed in a recommended satellite appendix after the sequence of accounts.

3. *The importance of the structure of the system of economic accounts*

The above detour concerning the holding gains issue shows us once more the importance of the general question of the structure of the system of economic accounts (that is, the system of accounts of the Economy as understood in part I of this paper). In this perspective, the SNEA is made of the SNEA Central Framework on the one hand, and Satellite accounts of various types on the other hand. While this distinction is generally known, broadly speaking (most national accountants have a certain idea of what satellite accounts are), it is not sure that it is as well understood as it should be. Anyway, when thinking about the future of the SNA, it is useful to look at it again. In effect the temptation of people arguing in favour of introducing a new treatment in the SNA generally seems to ask for such an inclusion, though not necessarily explicitly, in the central framework itself. In a number of cases however, other options are open that usually are not explored (here I have in mind again the case of military activities).

As I said already, making the concept of central framework, including its name, fully explicit and well understood is crucial. This is closely connected with the importance of knowing and understanding the accounting structure, including the full sequence of accounts (current accounts, accumulation accounts, balance sheets) of the SNEA and its implications. Too often the use of expressions like "core accounts" has been a source of misunderstanding, some people taking a truncated traditional (that is, before the SNA 1993) sequence of accounts, ending with the financial accounts, as if it were the central system's sequence of accounts itself. Unlike the SNEA Central Framework, the satellite accounts (or "Other SNEA Constructs") do not constitute a closed system. Their relationships with the Central Framework can be of various types, and they can also be connected in various ways with other information bodies. Below, a number of examples are discussed, using the expression "satellite accounts" as an umbrella denomination.

Certain satellite accounts, like the one covering the own account production of services by households, can in principle be fully integrated in the Central Framework. If in practice they are not integrated in current annual and quarterly accounts, it is for practical reasons, not for conceptual considerations. Other satellite accounts, like the functional ones (education, health, social protection, housing, tourism, environmental protection expenditures, etc.), are fully compatible with the Central Framework in which their main components are included. Besides this, they are much more developed in connection with the specific information system to which they belong.

However, there exist more complicated cases, like the one on human capital (recent work is being done by the UNECE Task Force on Measuring Human Capital). For the time being, the only connection between human capital estimates and the Central Framework is through education expenditures which are treated as current expenses. Reflections in the past about the possible integration of human capital in the Central Framework concluded that it would imply such drastic changes in the accounting structure that it was not a desirable ambition.[12] Whereas this conclusion is correct, the treatment of education expenditures as current expenses was and still is unsatisfactory. I turn to this issue below in Part 3.

Furthermore, when briefly discussing the question of holding gains and income in the above, I suggested the creation of a possible new accounting tool called "semi-integrated variants," in order to illustrate the great variety of possibilities (not everything is acceptable of course). Another example of such a variant may be found in the valuation of public debt instruments, where the principle followed in the ESA/SNA debt figures differs from the one used in the figures corresponding to the definition of the "Maastricht debt."

It is not my purpose to further investigate here the potential flexibility in the field of broadly speaking "satellite accounting." However it would be useful to undertake such a reflection in the near future. It would probably help to clarify issues like the relationship between the SNA/SNEA and economic research on the one hand, and between the SNA/SNEA and administrative and public policy uses on the other hand. It would also allow for a more in-depth review of the relationship between the SNEA and other information systems.

4. *The SNA Central Framework revision strategy*

I now turn to the SNA Central Framework revision strategy as such. I use the term "strategy" intentionally. We need a clearer and, if I may say, revised revision strategy. Three aspects are interconnected in a revision strategy, the revision policy of the conceptual system, the implementation policy of the revised standards, and what I call, improperly perhaps, the communication policy.

[12]At that time the concept of human capital was taken in its full extension, for instance by John Kendrick (1976), that is, including tangible human assets (measured by the cost of physically rearing children until working age). For a brief summary of his book, see Vanoli 2005, p.306; a quick presentation of the obstacles to the full integration of human capital is p.306–307. Later on, in most cases, it was limited to (intangible) capital due to education.

Nowadays, we have in front of us a presentation of the 2008 SNA in the six hundred pages new version of the Blue Book. If we compare it with the 1952 SNA (not yet blue at the time), the present SNA is incomparably richer than the old one. It reflects half a century of huge developments in information and national accounting systems. However we have to ask ourselves the question: "who knows it (the book)?" (of course, I do not mean "who knows every detail in the book?," but "who is reasonably familiar with it?"), and above all "who knows the accounting system itself sufficiently, in order to avoid big interpretation mistakes?." Here, I do not have the intention to really try to give an answer to these questions. Trying to answer them requires a dedicated investigation, which is in my view badly needed.

In respect of the above, we recently had a quite unpleasant experience with the media and beyond in Europe, when the revised accounts following the implementation of ESA 2010 were published. This implementation, in Europe at least, also covered the estimation of illegal activities and prostitution, which from a conceptual point of view were already included in the SNA 1993/ESA 1995. It has been an incredible experience. For instance, not only journalists, but many other commentators were fascinated by the inclusion of prostitution and illegal activities in GDP, often confusing a level increase with an increase in the rate of change. On the other hand, there were no comments, positive or negative, on the inclusion of weapons systems in fixed capital formation and economic assets (sometimes it was wrongly understood as if they were recorded in production for the first time). Only the R&D issue was generally quite well understood.

It also showed that not only the media but also the economic research community seems to keep far from a reasonable level of knowledge in the field of national accounting. In this respect, let's have a look to the concluding remarks of the paper by Peter van de Ven I referred to earlier (Van de Ven, 2014): "In the past decades, national accounts have become very successful, although a large part of the economic research community seems to have turned their back to the intricacies of defining and measuring macro-economic data … increased use of national accounts data, including … for so-called "administrative purposes." User demands for high quality macro-economic data have grown accordingly … a growing alignment of international standards … On the other hand, the success has also created expectations … National accounts also increasingly have become the object of criticism in media and academic research … Sometimes these critiques are justified and call for further investigation. In other instances the comments and remarks simply show a certain ignorance [how elegantly this is formulated! AV] of the standards and what they intend to measure, and call for enhanced communication from the national accounts community." (§ 108).

To be honest, though there are major problems in the teaching of economics and the training of journalists specialised in economic topics, we should also acknowledge that we contributed to this, by seriously complicating the picture, thus hampering a full understanding of the system. At the start of the 90s, we published the SNA 1993 which represented a very significant enhancement as compared to the SNA 1968 issued twenty-five years before. In 1993, a significant number of countries, especially out of North America and Western Europe, were still using the UN or the OECD old post-war versions, whereas a number of

countries were following the Material Product System. New series of national accounts data, following the SNA 1993, were published in the following decade or so.

However, already fifteen years later, we published a new version, the SNA 2008, and the corresponding Blue Book, with some significant changes and a partial, not always apparent, wider rewriting. Soon, on this basis, new series of accounts were prepared through a major effort by national accounts compilers. We probably would have needed something like the following: a Blue Book (on line or in print is a secondary issue), starting from the 1993 version and showing explicitly what had been deleted, reformulated and added in order to get the 2008 version. Probably, such a goal would only have been achievable under the condition of a far less ambitious revision of the System and the Book so soon after the publication of the SNA 1993. This was the initial intention, but the practice was different.

There have been two negative consequences, directly or indirectly, of the, at least "de facto," strategy which was followed in practice. One is that national accounts compilers had little time to reflect upon new problems, like accounting for Nature. The other one is that the research community was not sufficiently involved in the discussion of certain important issues. Currently, my general conclusion is that the revision strategy in the next period of time should be modest in terms of making changes to the system's central framework. This does not mean that nothing has to be done. What I have in mind is that we need a period of stability in the conceptual framework of national accounts. I do not have any ready-made and firm proposals in this respect. What I can do is to put forward some suggestions to be considered and possibly further elaborated. In doing so, I will distinguish the three aspects mentioned above: conceptual revision/elaboration, implementation, communication.

The first suggestion is to disconnect in a certain way the conceptual elaboration process and the implementation strategy. Defining a proper implementation strategy is a serious problem.[13] For various reasons, influential users, such as the European Central Bank, urge statistical offices to change rather frequently their national accounts series in order to keep them to date, as much as possible, with the economic and financial evolution, including the influence of the latter on the conceptual SNA framework. As a consequence, the current statistical policy, in the European Union, is to have a complete revision of the accounts every 10 years or so. This is, most probably, too ambitious in a general context of tightening resources. On the other hand, changes in the structure and working of the economies push users and compilers to require adaptations, at the limit almost continuous adaptations of the System. This, in turn, leads to the requirement of introducing changes, hopefully enhancements, made to the conceptual system as soon as possible in the compilation of national accounts.

Instead of the above, it would be preferable to try to combine more or less continuous research efforts on carefully selected important issues with a less

[13]As we know the problem is actually wider that the implementation of changes in the conceptual system. There is also the necessity to take into account the progress of statistical sources, including changes in classifications.

frequent inclusion of the results of this research in a completely new version of the Blue Book, and also a less frequent implementation programme, certainly compared to the current practice. In between two versions of the Blue Book, provisional conclusions that have been agreed upon could be put in "waiting boxes," like a kind of provisional "Blue Book on line." Such a latency period would have a number of interconnected advantages.

Firstly it would give national accountants the opportunity to consult interested people in various circles outside official statistical services or nearby agencies. Such a consultation procedure could be formalised, thereby possibly taking as a reference what is being done in the process of elaborating international business accounting standards. One of the objectives of such a procedure, apart from getting useful substantial comments, would be to make people progressively acquainted with the changes to come later on in national accounts estimates, instead the current practice of receiving a lot of information at the same time on a large number of new features of the accounts.[14] Secondly, it would give the national accountants community the opportunity to check carefully which adaptations of the System at large are really required.

Let's take an example, especially important in the present times, of the consequences for national accounts of globalisation and the representation of the activities of multinational enterprises. Some years ago, when the problem emerged, one could have gotten the impression that a big overthrow of the System Central Framework was to be expected. Nowadays, after the reflections, still in progress, of the two Working Groups referred to above, I get the impression that probably no significant change of the structure of the system is needed (not even changing the basis of recording international trade flows, as included in the SNA 2008, shows to have been necessary).

The problems we have to face nowadays are twofold. Firstly, we face major practical problems, possibly involving political actions by governments to get the necessary information and then treating it properly (specialized teams in statistical offices can be needed, they already exist sometimes). The second issue concerns the provision of a good representation of globalisation through a set of interrelated accounts and matrices. This probably will lead to a complementary satellite framework, fully compatible with the SNA/SNEA Central Framework on the one hand, and integrated in a research framework on the world economy on the other hand. In so far as the Central Framework is concerned, it is probably basically a question of introducing and completing certain classifications, and providing additional interpretations (see below) in order to clarify the relationship

[14]A much broader issue is the regrettable absence of any extensive public debate on certain crucial questions. One example is the inclusion of the acquisition of weapon systems in fixed capital formation and economic assets. Another example is the complex issue of the relationship between observation and analysis. I published some comments on this theme in the December 2010 issue of the Review on Income and Wealth, with a Reply by a group of colleagues from the US. My expectation was that the publication of these two papers would initiate a debate in the Review. Unfortunately it was decided in advance that I would not be given the opportunity to react to the Reply. So, in the end there was no extended discussion. This is however an important feature in the discussion on the future of the SNA with, though not only with, the economic research community. Perhaps EURONA, the new Eurostat review on national accounts and macro-economic indicators, could provide the opportunity to contribute to such open public debates.

between the accounts of the Central Framework with this satellite framework. If my interpretation of the on-going reflections is correct, the implementation of this complementary satellite framework could be done independently of any general revision of the central accounts.

More generally, in a number of instances, certain cases can be dealt with by modifying or further articulating the interpretation of what is written in the last version of the Blue Book, without necessarily modifying the standards themselves. In such cases, we should refrain from unduly rewriting the 2008 SNA. Subject to further reflections, we could imagine an on line set of interpretations that would become official interpretations following a given procedure of confirmation. Again the purpose is to stabilise the System and the Manual.

I now would like to turn to the communication strategy. As already indicated above, we should try to involve more people than in the past, for instance in the economic research and education community and specialised medias, in the discussion of certain issues, as soon as possible after they have been fully investigated by the national accountants and a set of solutions has been proposed. A more far reaching proposal is that we should perhaps reconsider the presentation of the SNA which is provided in the Blue Book in more depth. The 1993 Blue Book, with its 21 chapters, was close to become a monster. The 2008 Blue Book, with its 29 chapters, is definitely a monster. The purpose of chapters 1 and 2 (Introduction and Overview) was to provide users a synthetic introduction to the System. Inserted in such big books, they most probably are not perceived as being more attractive than the book as a whole. We must admit that the Blue Books are for national accountants, and possibly a handful of economists.[15]

Of course changing the 1993/2008 Blue Book is out of the picture now. Reconsidering the way in which to present the SNA Manual is a task for the future, possibly some twenty years after the 2008 version. So, what can we try to do in the near future? It seems to me that we should prepare, as a kind of antechamber to the Blue Book, a presentation of the existing SNA (taking into account on-going discussions) directed to economists, other analysts, policy advisers, and more generally people that are interested in the main national accounts results. To be more concrete, the objective expressed in a simplified way would be to have a concise publication that includes "what any economist should know about the SNA?," i.e., what the SNA covers, what it does not, what it can try to cover, what it cannot, what is presently disputed, what is the relationship between the SNA and economic theory in terms of the measurement of well-being, the inclusive wealth approach, the sustainability perspective, what is the relationship between the SNA and business accounting standards, etc. Then a summary presentation of the accounting system could be provided, with the distinction between the fully integrated central framework and the other accounting constructs, etc.

People familiar with the Blue Books will notice that what is proposed here looks basically like a combination of the contents of Chapter 1 (Introduction)

[15]Note that the function of handbooks teaching national accounting, like the excellent OECD's text, Understanding National Accounts by François Lequiller and Dererk Blades, is different from what is discussed here, that is, the presentation of the Blue Book itself.

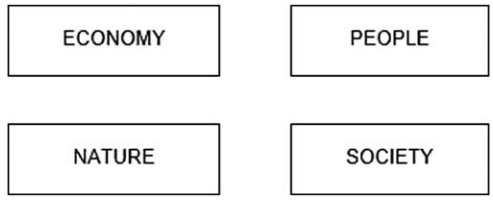
and 2 (Overview) of the 1993 and 2008 SNA. Also the topics covered are rather similar. However, to be successful, the end product should look very different. It should be a separate volume, a little longer than the present text, but of no more than one hundred pages. Above all, the drafting should be adapted to the relevant audience, thus not directed to national accountants themselves, and the volume should be self-sufficient, even if in the future it could be the first of a series of volumes replacing the single volume of the present Blue Book. Though it is now premature to propose a precise design for the next Blue Book, we should most probably have in mind a series of three or four volumes in the future.

The topics discussed in this Part 2 of the paper can certainly raise rather delicate issues as regards the governance and management of the national accounting system, a conclusion very similar to what is written at the end of Part 1.

Part III. The SNA in a Broad Information System Perspective

The conclusion in Part 1 above is that the SNA integrated Central Framework cannot cover the whole content corresponding to the inclusive wealth approach, its conceptual model and its ambition to measure the resulting well-being in a sustainability context. In order to make this clear for users and the research community, I stressed the desirability to adapt our terminology. We should preferably refer to the System of National Economic Accounts (SNEA), when speaking about the traditional national accounts.

Taking this conclusion as a point of departure, it is useful to briefly specify the position of the SNEA in a broad information system perspective. For this purpose, four large "spheres" and their related information systems are distinguished:



The SNEA is obviously in the sphere of the Economy. Having a look first at the relationship between Economy and Nature, it is necessary to clarify the relationship between the System of Environmental-Economic Accounting Central Framework 2012 and the SNA/SNEA Central Framework. There is a regrettable risk of confusion due to the use of the expression Central Framework in the first volume of the SEEA 2012. This first volume of the SEEA 2012 actually fulfils three main functions.

The first one is to estimate the value that can be attributed to the depletion of natural resources, in order to derive additional aggregates by subtracting this depletion from the traditional net national accounts aggregates after the consumption of fixed capital has been taken into account. This treatment is a possible candidate (not the only one, not the best perhaps, see above) for inclusion in the SNEA Central Framework in the near future, as this solution leaves the nominal value of GDP unchanged as compared to the present SNA. The second function

of this volume is to provide a detailed accounting framework, in both physical and monetary terms, for natural resources (most of which are market resources). As such it may be considered as belonging to both the accounts of the Economy (either or not a part of a satellite account) and the accounts of Nature. The third function of the volume corresponds to components which are already included in satellite accounts, like environmental activities, environmental protection expenditures, etc. A possibility to be considered in the future, depending on the choice made for the SNEA Central Framework, would be to introduce, as what I've called above "a semi-integrated variant," an alternative treatment of the depletion of natural resources, leading to its deduction from nominal GDP itself, as a revenue accruing from the disposal of an asset (not as a revenue originating in production, like it is treated to-day).

Now turning to the possible accounts for ecosystem assets and ecosystem services, as proposed for instance, on an experimental basis, in the SEEA 2012 Experimental Ecosystem Accounting, it may be clear that in my view, and following the discussion in Part 1, there is no realistic perspective of a full integrated system covering, in monetary value terms, both the accounts of the Economy and the accounts of ecosystem assets and services. Possible accounts for ecosystem assets and services thus belong to the accounts of Nature, not to the accounts of the Economy.

To further explain the latter point, let me start with the ecosystem assets. In doing so, physical accounts and monetary accounts should be considered separately. In general terms, developing accounts for ecosystem assets in physical terms is crucial. It requires considerable progress in the knowledge of Nature. Beyond quantitative data that are rather easy to observe and measure, the crucial variable is the state of health of the ecosystems (qualitative data concerning sets of characteristics). A point of reference is the Millennium Ecosystem Assessment. Obviously, physical accounts for Nature cannot be a task that is to be fulfilled primarily by national accounts compilers. Joint efforts of many experts in the various fields of Nature's observation and analysis, including the development of statistical data, are necessary. The purpose is to observe and measure the total stocks of ecosystem assets and their changes due to various factors, with a special focus on the degradation due to economic activities.[16] Observing total stocks as well as their changes in physical terms gives the possibility of partial sustainability assessments, as far as environmental norms (generally in terms of given ecosystem health characteristics) have been determined in the form of societal standards. It allows for trying to answer the question "are we driving in the right direction or not?." Such an objective points in the direction of evolving towards a kind of periodical Census of Nature.

A central question, when thinking about developing accounts or other types of macro indicators in physical terms for Nature, is the issue of equivalences between heterogeneous types of ecosystem assets. Many, probably the majority of specialists of natural sciences, seem to be reluctant towards the possibility of combining, by one way or another, such physical observations, with potentially

[16]The valuation of this physical degradation in equivalent transaction value corresponds to what is called in Part 1 above "Unpaid ecological costs."

significant divergences between experts. The carbon content appears to be an acceptable equivalent in a rather wide field. There is, however, for the time being no such equivalent concerning biodiversity. Using agreed upon social weights to combine sets of physical data is perhaps possible and has to be attempted.

An ambitious approach has been proposed at the European Environment Agency in Jean-Louis Weber (2011). It was used as a basis for the preparation of the recent document published by the Secretariat of the Convention on Biological Diversity (Weber, 2014).The objective is to estimate the total ecosystem capital capability, the capital capability being the ability of the natural assets to continue to deliver their services. The proposed estimate is in terms of (non-monetary) ecological value of the assets as a whole, in a holistic methodology, based on assessment of ecosystem integrity, health or resilience.

As far as asset accounts in monetary terms are concerned, the link between the accounts of the Economy and the accounts of Nature, which is proposed in Part 1 above, is the estimate of the value of the degradation of ecosystem assets (in equivalent transaction values) due to economic activities, leading to a valuation of final demand at total costs (paid economic costs *plus* unpaid ecological costs). A flow of "Net degradation of ecosystem assets" is recorded between Nature and the Economy. The accumulation upon time of the latter would provide an estimate of the ecological debt of the Economy towards Nature. In the Nature's accounts, symmetric flows and stocks are to be recorded. It is worth mentioning that similarly, in Weber's experimental framework, only that part of the ecosystem assets which is degraded is to be valued in monetary terms, also following the 1993 SEEA maintenance costs type of valuation.

Let's now turn to the services of ecosystems. Concerning ecosystem services, nothing is suggested to be recorded, for the time being, in the proposed SNEA Central Framework. This issue is completely left to the possible accounts of Nature.[17] A lot of research is going into this field, generally on specific types of services (like the pollination services) or on the services of specific types of assets (like coral reefs or mangroves). Such "*micro or meso" studies* generally located in specified geographical zones, are useful and necessary, in combination with avoidance and/or restoration costs estimates, to help making choices. It is clear however that the valuation methodologies used generally do not provide estimates which can be interpreted as equivalent transaction values, because they include surpluses. Above all, possible estimates of the value of ecosystem services at the macro level raise very complex issues.[18] As a consequence, their possible linkage with the SNEA Central Framework cannot be contemplated given the present state of affairs. My view is that, *for national account purposes*, much higher priority should be given to the estimation and recording of the degradation of ecosystem assets as a whole, although this is, admittedly, not an easy task either. Then, time passing, we can see what possibly emerges from the present undertakings concerning ecosystem services.

[17]In this respect, the title of the SEEA, even without the qualification "integrated," would have to be reconsidered, in order to clarify what is the objective of the SEEA.

[18]One should also keep in mind that the feasibility itself of the recording of ecosystem services in physical units is still an open issue.

When it comes to the relationship between Economy and People, It is obvious that People participate in the production activities of the Economy. However, traditionally in the SNA, human capital is not shown among assets, although a number of economists have made estimates of human capital, mostly in the context of productivity measurement and the analysis of the factors of growth. The possible inclusion of human capital in the SNA Central Framework itself has been debated for a long time. As already said earlier in this paper, the full scale integration of human capital has always been ruled out in order to avoid overburdening the accounting system. Nevertheless, the treatment of education expenditures as current consumption expenditures has generally been questioned and is still a source of discomfort. Now that R&D expenditures have been included in gross fixed capital formation, giving rise to a new type of intangible assets, a similar solution could be contemplated for education expenditures (actually human capital estimates by economists are generally limited to measuring the stocks of education capital) in the central framework.

As there are some complex issues involved (notably, for the stocks, the recurrent opposition between the accumulation of expenditures approach and the present value of expected future incomes), the question should be carefully investigated, for instance through an experimental satellite account. In order to avoid a too passionate debate, it would be wise to approach the question in the wide perspective of trying to design a human resources account or rather a set of accounts, as part of the information system on People, with a number of links to the accounts of the Economy, starting by breaking out the relevant transactions in the SNEA. In so far as human capital is concerned, it could well happen, after such a deep reflection is completed, that more than a single solution is agreed upon, depending on the type of accounting construct which is considered: a minimal one limiting itself to the introduction of a fixed capital formation of education and the corresponding asset in the (integrated) Central Framework (for example, the solution referred to in the previous paragraph, using the accumulation methodology); a variant in a satellite account of the SNEA (for instance, using the present value of expected future incomes methodology and comparing the two solutions); and/or possibly more sophisticated approaches, covering for instance other dimensions of human capital like health, in economic research frameworks.

By the way, such an approach using a "set of solutions" can be useful for solving some other difficult issues as well. The production of services for own use by households can be considered a good case in point. There is a general agreement that the value of unpaid labour time spent in these activities is in principle eligible for inclusion in the SNA Central Framework GDP. It is conventionally excluded for practical reasons. There is also a general agreement that these activities should be measured (and included in a variant of GDP) in a satellite account, every five or ten years or so (this periodicity is unfortunately not respected in practice).

There are two main options for this satellite account. The first one is to limit it to the estimate of the unpaid labour (possibly with several valuation hypotheses), and its inclusion in a variant of GDP. The second one is to build

a complete account for the household production of services for own use, by reclassifying part of the present household final consumption into intermediate consumption or gross fixed capital formation, calculating additional consumption of fixed capital, etc. in a framework distinguishing the various types of services in question. No explicit choice has been made between them, though in practice the first option has been chosen much more frequently. The rationale for the first option is the desirability of not overburdening a satellite account whose purpose should be to present, on a regular basis, a variant that is close to the Central Framework itself. However, this SNEA satellite account should also present the stock of household durable goods other than dwellings (dwellings are already included) as an alternative in the balance sheets of the household sector. The second option is more in the nature of an economic research framework on the household activities in question. It is a more sophisticated type of satellite account.

People receive primary and redistribution incomes from the Economy. They acquire consumption and capital formation goods and services, they also acquire financial assets and incur liabilities. These flows and the related stocks are recorded in the household accounts (current, accumulation and balance sheets) which are, at the same time, part of the Central Framework of the Economy and part of the information system on People.

Following the recommendations made by the Stiglitz, Sen, Fitoussi Commission, and on the basis of some previous successful attempts, work is developing in order to take the distributional dimension into consideration by disaggregating the household accounts, notably by combining micro and macro data. In this respect, it is interesting to note that in the past the importance of income and wealth distribution by type of households has been stressed more than once, either in specific sets of recommendations or in the Social Accounting Matrices, or in the 1993 version of the Blue Book (chapter XIX, section B).

The same Commission considerably clarified the welfare measurement dispute. It seems now generally, or quasi generally, agreed that the SNA/SNEA aggregates do not have the purpose to measure welfare (the Commission preferably used the term well-being or quality of life), and they cannot do it either. Moreover, beyond the SNA aggregates themselves, the assessment of well-being/quality of life cannot be integrated into a single monetary aggregate. Trying to design a composite index requires social choices. Well-being is multidimensional by nature. The Economy delivers goods and services which are means that people, in combination with other means, transform in well-being. Sometimes, the aggregate of the goods and services delivered is called "material well-being." It seems to me that such a terminology could be a source of confusion, and should thus be avoided in national accounting.

Various satellite accounts on health, education, culture, social protection, unpaid household activities, etc. belong to both the accounts of the Economy and the accounts of People (especially so when they include data on beneficiaries, and the distribution across people). However the framework for the assessment of well-being/quality of life is not an accounting framework. It cannot deliver unequivocal results either. It involves possibly conflictual social choices reflecting

a variety of value systems. Trying to reach a provisional consensus would imply a procedural methodology in a relevant context. Initiatives like the OECD "Better Life Index" are contributions in the right direction.[19]

The fourth sphere distinguished above is Society. The accounts of government are part of the accounts of the Economy. They reflect government activities/functions which take place at the level of Society. Collective consumption is in principle the part of government consumption expenditures that cannot be individualised, i.e., allocated to individual persons or households. In some parts of government activities, satellite accounts, covering also other institutional sectors' activities, have been designed, concerning for instance health, education, social protection, environmental protection and R&D. A satellite account would be particularly relevant for defence/military activities. Similarly to what is suggested above for the measurement of household durable goods, it would have been sufficient to show the stock of military durables as an alternative in the balance sheets of the government sector, leaving further analysis to such a satellite account. In my view, military durables have to be seen as political assets, whose use does not concern a process of economic production.

Beyond government and other public bodies, non-profit organisations are important institutions usually created by the civil society. The interest to attribute a value to the unpaid voluntary work is recognised. On the other hand, the participation of people (civic engagement) is only one dimension in the assessment framework of well-being.

At the level of Society, the wealth of a nation or of humankind as a whole includes many intangible assets (cultural, political, moral, social value systems, etc.), which are difficult to integrate in a proper information system. Trying to attribute a value to them (whatever the type of value system that can be contemplated) constitutes a major challenge. Sometimes economists referred to such Society's characteristics when trying to explain, for instance, part of the differences between various countries' rates of growth. It is probably not conceivable to classify all of them under the umbrella expression of "social capital," as the latter generally seems to put on a par with the more limited concept of "social connections" between people, through diverse types of association, and governance. As such they are taken into account as part of the framework for the assessment of well-being/quality of life.

In the approach presented above, certain social concerns are transversal. A good case in point is environmental accounting. It mainly covers the accounts of Nature and, according to my proposal, the link between the accounts of Nature and the accounts of the Economy through the value of the degradation of ecosystem assets due to economic activities. It also covers modules possibly included in other frameworks. For instance environmental protection expenditures are a satellite account in the accounts of the Economy, a module on environmental health damages can be part of (satellite) health accounts which belong to both the

[19]See for instance the set of articles published in the March 2015 issue of the Review of Income and Wealth "New Measures of Well-Being: Perspectives from Statistical Offices," edited by Peter van de Ven. The article by Martine Durand presents "The OECD Better Life Initiative: How's Life? and the Measurement of Well-Being" (Figure 1, page 5, shows The OECD Well-Being Conceptual Framework).

accounts of the Economy and the accounts of People. Inequalities as regards environmental amenities or nuisances have to be considered for the assessment of well-being of various groups of the population.

Conclusion

The last pages show that national accounting is wider than building the economic accounts of a nation. For instance the accounts of Nature are part of national accounting, not part of the accounts of the Economy. Also accounting for the Economy is wider than the SNA/SNEA Central Framework stricto sensu, because of the existence of many satellite accounts or other semi-integrated constructs. One should also have in mind that, in the broad information system perspective designed here, the issue is not only to present a framework for a broader set of accounts, but also to capture the interrelationships between accounting constructs and other types of information tools in a given sphere, field or domain, and even between them.

Flexibility is the master word. Using flexibility margins provides possibilities to take various phenomena into account without unduly complicating the SNEA Central Framework or, even worse, engaging in unrealistic estimation procedures. It should be recognised that such an orientation differs from the usual pressure from economic theory towards integrating as much as possible every relevant concern in a single comprehensive framework in monetary value.

The best illustration of this difference in orientation is given by the concept of inclusive wealth. All segments of the inclusive wealth notion are present in the information system approach advocated here (economic assets, natural assets, human capital, social capital). However, contrary to the conceptual model of inclusive wealth, they are not supposed to be combined in an all-encompassing measure of total wealth in monetary value, from which welfare/well-being can be derived and sustainability can be monitored. Trying to implement this conceptual approach, if considered valid, is left to research and analysis. Finally, it should be noted that managing such a flexible information system approach is not an easy task. It assumes a conceptual coordination capability which is perhaps weaker today than it was in the past when both national accounts and statistical systems were less developed in a simpler economic and social environment.

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