National Accounting at the beginning of the 21st century: Wherefrom? Whereto?
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After discussing the long period of intermittent national income estimates produced from the second half of the 17th century to the first quarter of the 20th century, this article reviews the great achievements of national accounting in the last century. It insists on three themes: the emergence of an accounting approach applied to the level of a national economy and the economists’ debate around it; the long process of international harmonisation leading to a single system of national accounts by the end of the century; and the enormous development of national accounts data produced and their uses. However, in relation to important changes in social concerns in the last quarter of the century, new requirements have appeared; and the interpretation and relevance of national accounts results have been increasingly questioned.

The second part of this article looks at the three main challenges facing national accounting today. The long-lasting welfare measurement dispute is analysed, from Pigou, Hicks and Kuznets to the Stiglitz Report, through Nordhaus and Tobin. Secondly, national accounts have to adapt themselves to a rapidly changing economic world; and particularly to the complexities generated by the puzzle of globalisation. Finally, accounting for environmental issues, more specifically the interaction between economy and nature, and taking care of sustainability concerns represent the most complex new challenge that national accounting is urged to meet. There are two conflicting views in this respect. The first one, based on a theoretical approach to sustainability in the context of an extended/inclusive wealth concept (produced, natural, human and social capital), calls for a fully integrated and comprehensive national accounting framework covering all these dimensions at the same time. This author is sceptical about the feasibility of such an ambitious approach in current ex post national accounting. The alternative more pragmatic view is most probably unavoidable and could be agreed upon for current accounting. It consists in a multiple frameworks approach with various types of link between them. The existence of tensions between ‘observation’ and ‘analysis’ should be acknowledged.

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Introduction

The purpose of this article is twofold. On the one hand, it provides an overview of the emergence and evolution of national accounting during the 20th century, after a short reminder of the long story of national income estimates. In this respect, it is to a great extent a summary of the book *A History of National Accounting* (Vanoli 2002, 2005). Following a chronological presentation, it provides links to economists’ debates regarding the usefulness of the accounting approach. The focus is on the development of international standards for national accounts until standards converge.

On the other hand, the article describes and discusses the most important challenges facing national accounts today. One is the long lasting welfare measurement dispute. The two other main challenges discussed are globalisation and the possible extension of the national accounts to include interactions between the economy and nature.

Part 1 — History: great achievements

Antecedents

Looking back over the 20th century, one is impressed by the enormous but unequal development of statistical information in nearly all fields of social concern. The achievements of national accounting have been remarkable. At the eve of the Great Depression in the early 1920’s, national accounting simply did not exist. Of course early roots can be found in the past. In the case of national accounts, William Petty in 1665 and Gregory King in 1695 in England, soon followed by Boisguilbert in 1697 and Vauban in 1707 in France, produced first estimates of national income. But after this early beginning, estimates of national income were only produced intermittently and developed slowly. Paul Studenski, in his encyclopaedic work *The Income of Nations* (1958), noted that national income had been estimated at least once for only eight countries by the end of the 19th century, and for some twenty countries by 1929.

During this time of development, and using various methods, national income was estimated as a stand-alone measure. Similarly, when the more numerous measures of wealth were produced from 1850, they were unconnected to national income estimates. However, there was an exceptional precursor. Gregory King, in addition to making comparative estimates of income and expenses for England, France and Holland in 1688 and 1695, made consistent estimates of various economic measures (income, expenses, increase or decrease of wealth, and so on) for England and for a series of years (1688 to 1698). He went so far as to create an account of the population by detailed social groups. Paying his tribute to King in his Nobel Memorial Lecture 1984, Richard Stone regretted that ‘after this brilliant start, all thoughts of balanced accounts seem to have evaporated’. This remained the case until the eve of World War II.

As long as attention was focused on the measurement of a single concept such as national income, there was no incentive to thinking in terms of accounting and interrelationships. In practice, estimating the national income of a country consisted of gathering the largest possible amount of data, processing it ingeniously and filling the big gaps in the availability of data. Those were the days of enlightened amateurs. Methods of estimation were diverse, depending on the type of information that was available. Compilers usually combined elements of what will later be called the three approaches to the compilation of national income: output, income and expenditure. However, they were thought of as combined partial methods of estimating national income, not as attempts to measure three interrelated but different concepts and aggregates standing for themselves: income,
production and expenditure. This confusion caused problems later.

**From the Great Depression to World War II**

The statement by Stone on the lack of attention to balanced accounts should not underplay the progress made during the 1930s. The influence of the First World War on national income estimates was very limited, and it was the 1929 Great Depression that was a turning point.

Firstly, large programs of national income estimates were developed. An official demand originated in the United States Senate in 1932, leading in 1934 to a report prepared by Simon Kuznets and his assistants (National Income 1929-1932) in current prices, by type of economic activity and distributed income. Estimates were then extended to expenditures (final consumption and capital formation) by Clark Warburton. Warburton's 1934 article seems to have been the first use in print of the term gross national product (or gross social product) as the sum of these two final expenditures. A few years later Kuznets also used the expression 'gross national product'.

Other large programs to develop national income estimates were seen in Sweden (National Income in Sweden 1861-1930, published in 1937 by Erik Lindahl, Einar Dahlgren and Karin Koch) and also The Netherlands (Jan Tinbergen) and Denmark (Viggo Kampmann); whereas in the United Kingdom Colin Clark extended his previous 1932 estimates to a fairly comprehensive coverage (National Income and Outlay, 1937).

Secondly, some national income compilers started thinking in terms of national accounting by exploiting analogies to business accounting. Irving Fisher in his theoretical works (1906, 1928) had formerly evoked the extension of the accounting treatment of individuals and businesses to society as a whole, and proposed obtaining in principle the capital and income of society as a combination of balances of businesses and income accounts of individuals. This was however unconnected to quantitative estimates.

More directly in relation to national income estimates, Morris A. Copeland showed (1932, 1935, and 1937) the benefits of using a double-entry book-keeping system in the estimation of national income. By 1936, another American, Robert F. Martin from the Department of Commerce, presented the idea of an accounting system for the national economy. In France in 1939, André Vincent published his views on the application of accounting principles to the national economy considered as an entity. In The Netherlands, Ed van Cleeff produced estimates for 1938 (published in 1941) within the format of a national accounting system. He presented national accounts 'as the business accounts of the nation' and compared the government 'with the directors of a big firm'. There were two different approaches used in these first presentations of the idea of a system of national accounting during the thirties. The first was mostly operational (Copeland, Martin), emphasising the technical advantages of such an approach for making better estimates of national income. The other one (Vincent, van Cleeff) conveyed, in addition to the former, views on better economic organisation for the nation and an emphasis on planning after the disorders of the Great Depression.

In terms of studies on national income, the 1930s witnessed improvements in methods, the beginning of a trend toward official status, regularity in the publication of series, and the emergence of expenditure aggregates, representing the use of national income for consumption and capital formation. During the second part of the thirties, macroeconomics rather than business accounting was the seminal influence that led to the use of an accounting format at the macroeconomic level.

Thirdly, macroeconomics called for a new concept — the economy of a nation as a whole, with a set of interrelated quantitative measures of basic concepts in monetary terms. The equations that described their mutual relationship were formulated by John Maynard Keynes in his *General Theory of Employment, Interest and Money* (1936). They would become the skeleton of National Accounting.
In brief, the relationships are:

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\text{Income} = \text{Value of output} = \text{Consumption} + \text{Investment} \\
\text{Saving} = \text{Income} - \text{Consumption} \\
\text{Therefore, Saving} = \text{Investment} \] \quad (\text{Book II, Chapter VI})

Of course, interrelationships in an economy had been present before in economic theories, but this was the first time that such concepts and their statistical representation became central to macroeconomic policies.

**World War II**

So at the end of the thirties, the way was clear for intellectual, economic and political progress. World War II provided the second decisive turning point in this direction. It witnessed the birth of national accounting as we know it today, and a wide extension of its uses. The impulse came with Keynes being asked by the UK government to tackle issues such as ‘How to pay for the war?’ and the problem of inflation (1940). An official study was carried out by James Meade and Richard Stone. The outcome was a report (‘An Analysis of the Sources of War Finance and Estimate of the National Income and Expenditure in 1938 and 1940’ in the April 7, 1941, White Book) and a technical article (‘The Construction of Tables of National Income, Expenditure, Saving and Investment’, Economic Journal, June-September 1941). This article presented the accounting structure that Meade and Stone had developed. This framework was incomplete. Though separate estimates for businesses, persons, government and the rest of the world appeared in the tables, the accounts of the sectors were not shown explicitly. Neither the structure of the production system (only the net output of seven broad economic activities) nor the financial transactions were shown. Nevertheless, the set of tables published in 1941 represents a first system of national accounts, providing a framework linking a coherent set of macroeconomic totals.

**Stone’s 1945 memorandum and the beginning of standardisation**

At the end of World War II, Stone presented a proposal for a more elaborate accounting system. The latter served as the basis for a meeting of a subcommittee of statisticians of national income from the League of Nations (Princeton, December 1945). Stone’s memorandum was revised after the meeting and published in 1947 by the United Nations, under the title ‘Definition and Measurement of National Income and Related Totals’, as an appendix to the subcommittee’s report. A summary of this accounting framework is given in Vanoli, 2005, pp. 24-25 (the full set of accounts is reproduced pp. 32-40):

‘In the presentation of the proposed accounting system, sectors are the result of aggregation of accounting entities according to their function; these accounting entities are the basic economic units that perform the transactions. For each category of accounting entity it might be necessary to establish more than one account. Transactions are classified according to the nature of the counterpart to the money flows. Five main sectors are identified: productive enterprises, financial intermediaries, insurance and social security agencies, final consumers (including the general government) and the rest of the world. The first four are subdivided: business enterprises and persons (home-ownership); banking system and other financial institutions; insurance companies and societies, private pension funds and social security funds; persons and public collective providers. The list of the five sub-accounts is unique, but their size depends on the sub-sectors, and two of them might in some cases be combined. The main accounts used are the following: an operating account, an appropriation account, a revenue account (for current income and expenses of persons and public collective providers), a capital account, and a reserve account.’

The financial transactions are recorded in the reserve account.

‘Each transaction is entered twice in the system,'
following the double-entry principle, but there is no systematic description of the bilateral relationship between sectors (dummy accounts are therefore implicit). The link between the accounts of each sub-sector is sometimes a complex issue. For instance, for productive enterprises, the surplus of the appropriation account enters the reserve account and then, once combined with the net financial transactions, passes on to the capital account. Another case is that of realised net capital gains, recorded only for business enterprises, which appear in the reserve account, and are transferred to the appropriation account, from where they return to their point of origin as part of the net result of this account, finally to be sent to the capital account with the other financing means.

The aggregates that Stone described in his memorandum are completely consistent with the system of accounts, but not presented in the accounting scheme itself. They are derived from it. No accounts were presented for the national economy based on addition of sectoral accounts. This duality of system and aggregates will be a source of ambiguities.

Though not including balance sheets, the proposed system was well in advance of its time. The influence of business accounting could be easily detected. For example, sales, purchases and movements of inventories were recorded, although output and intermediate consumption were absent due to a lack of detailed data. An entry was included for bad debts between business enterprises and persons, as well as realised capital gains for business enterprises. It should be stressed that Stone’s 1945 memorandum conceived national accounts as the result of the aggregation of accounting entities and transactions.

In spite of this outstanding 1945 contribution by Stone, neither emerging systems of national accounts at country level nor the first steps towards international standardisation followed his lead, even although Stone himself led the preparation of the first standardised system (OEEC 1952). The subcommittee of experts at the 1945 Princeton meeting, chaired by Stone, indicated ‘total agreement’ with the Memorandum approach, but considered it impossible to implement a system as detailed as the one presented in the memorandum appendix. Instead a limited set of tables were recommended, with the emphasis on functionality.

Usefulness of the accounting approach still questioned — Kuznets’ position

So, at the beginning of the fifties at the international level, the concept of a system of national accounting appeared rather fuzzy and the use of the word ‘accounting’ almost inappropriate.

In Review of Economics and Statistics (August 1948) Simon Kuznets was critical of the new Income Series published in a Survey of Current Business supplement 1947; his view was that the system of economic accounts did not solve any problem linked to a proper definition of national income (for Kuznets, the purpose of national income was a measure of welfare).

Nevertheless, Kuznets did not deny the usefulness of a system of accounts, and he said:

’... the basic principle and great usefulness of the system of accounts is that it recognises distinct group of transactors; calls for a complete census of transactions of such groups through the accounting period; and, under the double entry system, compels a distinction between transactions that represent “borrowing” (in the widest sense of the word) by the given transactor unit from others and those involving “lending” by it to others’ (p. 154);

‘the development of entire families of gross totals of volumes of transactions, without any attempt at the “netness” that is associated with national income … (ibid). All students would welcome a detailed set of accounts that would distinguish groups of business, government, and family units characterised by different pattern of economic behavior; and that would, therefore, show as fully as data permit the input-output or sale-purchase relations among different industries and economic institutions. It is in the direction of developing such fuller reflections of the workings of our economy, with whatever gross
transaction totals can be derived from them, that the emphasis on a system of accounts naturally leads’ (p. 155).

Note that, on the same page, Kuznets referred explicitly to Morris A. Copeland for the money approach, and Wassily Leontief for the input-output tables.

The last quotation from Kuznets set precisely the program of development for national accounting in the second part of the century. It is clear from this last quotation that Kuznets’ reservations were not against, but in favour of such an orientation. Taken in isolation, his criticism of the U.S. National Income and Product Accounts (NIPAs), from the point of view of national income analysis (2), often led to a misinterpretation of his views.

**Strong demand and uses and expansion of the National Accounts**

The international standardised system, that played a central role as the implementation of accounts extended to an increasing number of countries, lagged behind that of more advanced national systems. Countries like France, The Netherlands, the United Kingdom, Norway and Sweden tended in the 1950s and 60s to develop their own systems of accounts. For instance, between 1952 and 1956, the British summary tables were presented as a table of sectoral accounts, called social accounts, which presented the accounts by sector (in columns) and by the accounting entries in rows: groups of transactions and balancing items. Odd Aukrust also suggested something similar in a 1949-1950 article. In France René Froment had devised (1945, 1947) the first presentation of something of this kind, which was systematised by the middle of the fifties, under the name of Tableau économique d’ensemble, a Quesnay-like title, in the new French system of national accounting.

More generally, the construction of national accounts at the country level took place in the framework of extensive demand and use, beyond that experienced before and during the war. Many factors were responsible for this demand, notably the reconstruction of economies post-war, anti-inflationary and growth policies, the extended economic and social role of government, and the development of international cooperation and integration. Tools were developed to help decision processes. Keynesian macroeconomic demand management required short-term economic budget forecasts; longer-term projections were needed for indicative planning in industrialised countries; and industrial analysis was required for development policies in the newly emerging independent nations. The development of modelling, input-output analysis, econometric techniques and national accounts estimates reinforced each other. On the whole, in the three decades following the war, national accounting experienced a golden age, not only because it expanded significantly, but also because its extension responded well to the requirements of society.

**The long process of international harmonisation**

The achievements of this period were accompanied by a long process of international harmonisation and extensions, rendered necessary by the world level coverage of economic analysis and the emergence of country integration in forms such as the European Union. Until the end of the sixties, in the West, a variety of national systems existed that were difficult to reconcile. France had adopted a narrower concept of production, limited to market goods and services. The accounts of countries following the same comprehensive concept of production, including non-market government services, were also not consistent. In the East, the Soviet Union and its satellites followed a restricted concept of material production, limited to goods and the so-called material services (mostly the transport of goods), and a totally different accounting scheme. The main issue at the world level was comparing the accounts of eastern and western countries.

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(2) Indeed, examination of the report fails to convey the impression that the setting up of accounts assisted in any way in solving these problems of definition and distribution. On the contrary, the impression is that these problems were solved without benefit of the system of accounts and that the system of accounts was constructed to fit the solution, *Review of Economics and Statistics*, August 1948, p. 153.)
Not surprisingly, perhaps, an initiative towards international harmonisation was taken by the six countries at that time comprising the Common Market in Europe. A full understanding of the accounts of the Member Countries was a basic requirement of the European Economic Community. At the beginning of the sixties, an effort was made to compare national practices on the basis of a ‘sectors accounts scheme’ derived from and completing the OEEC Standardised 1952 System. Very soon, however, it appeared that this scheme was lacking; and a more appropriate system was needed. This initiative led some years later to the European System of Accounts (ESA).

A report was prepared in 1964: ‘Propositions for a national accounting framework for the European Communities’ (André Vanoli). The main proposal was the integration of traditional economic accounts, input-output tables and financial accounts in an overall system that would be acceptable to all. This was not immediately achievable, as input-output tables were not accepted as part of the accounts in the Federal Republic of Germany.

The decisive support for an extended integrated system came from Stone. Following a UN request, at the end of 1964 he presented a report proposing drastic changes to the 1952 UN SNA (the latter was nearly identical to the 1952 OEEC standardised system).

Stone’s report was based on research carried out at Cambridge in the early 1960s by Stone and his colleagues, after a short-lived revival of the idea of planning in the UK. As a result of this research, ‘A program for growth’ (1962 and following) was published, and comprised a growth model, a social accounting matrix (SAM) and input-output relationships for the period 1954-1966. The Cambridge SAM linked the input-output analysis and institutional sectors’ accounts (including financial accounts as a memorandum item).

The second part of the 1960s was a period of intensive parallel discussions both within the European Communities and at the UN. These discussions ended successfully, with the 1968 SNA on one hand; and the first European System of Integrated Economic Accounts (1970 ESA) on the other hand. Except for the classifications of economic activities and products, differences between them were small, and the ESA was effectively the European Communities’ version of the SNA. This was the condition of its acceptability for some countries. However, the fact that it was formally an independent system was important both technically and politically for the future role of the ESA in Europe.

The 1950-1952 OEEC/UN standardised system had played an important role in promoting the implementation of national accounts but it was a limited presentation, and the economic accounts were often understood as covering neither the I-O tables nor the financial accounts. After the adoption of the 1968 SNA/1970 ESA, this picture was reversed. The international system then appeared to be well in advance of the practices and statistical capabilities of many countries.

The 1968 SNA

The 1968 SNA was not an attractive and pedagogical presentation of the system for many people. In particular, the use of a matrix format for introducing the general structure of the 1968 SNA, which was inspired by the 1962 SAM, troubled a lot of national accounts’ compilers. Input-output analysis was given so much attention in the first chapters of the Book that it gave the impression of an imbalance in the system. Following no mention in the 1950-1952 version, it was felt to be over-emphasised in the 1968 one. The two chapters devoted to it seemed to be directed at the same time toward both national accounts’ compilers and people already trained in the field. These chapters were rigorously and clearly drafted. Nevertheless it is probable that few readers were able to master the notions of true factor value, approximate factor value, true basic value and approximate basic value. The 1968 SNA recommended the use of the approximate basic value. The 1993 SNA/1995 ESA would also recommend approximate basic value, calling it ‘basic price’. See box 18 ‘Valuation of transactions on commodities (market goods and services) in the 1968 SNA’ in Vanoli 2005).

One of the great achievements of the 1968 SNA was
the differentiation between industries (producers of goods and services for sale at a price normally intended to cover their cost of production) and producers of government services, and the corresponding types of output: commodities on one hand, other goods and services on the other hand. Following the terminology proposed in Vanoli’s proposals of 1964, the ESA 1970 retained ‘market branches’ and ‘non-market branches’, ‘market goods and services’ and ‘non-market goods and services’. The terminology market/non-market was later used in the 1993 SNA.

The 1968 Blue Book included chapters, more elaborate than in the 1950-1952 version, devoted to the transactors and transactions in the system, followed by the standard accounts and tables. Nevertheless, in the 1968 Blue Book, a very elegant matrix presentation at the beginning coexisted with a dense presentation of a set of standard accounts and twenty-six standard and supplementary tables at the end. Altogether this gave the impression of a daunting system, more complex than it really was.

The 1970 ESA

For its part, the 1970 ESA was a model of clarity. Its drafting has been given a great deal of attention by a high quality team (Vittorio Paretti, Jean Petre, Piero Erba, Hugo Krijnse Locker, etc.). Detailed discussions among the six member countries allowed wordings and treatments in the ESA that were more precise than in the SNA and better adapted to the EEC situation.

The accounting structure was more extensive than in the SNA. Transactions were divided into three broad categories: transactions in goods and services, distributive transactions, and financial transactions. ‘Distributive transactions’ was a general category that was not identified in the SNA. The sequence of accounts split in two each of the three accounts of the 1968 SNA. A production account (balancing item: value added) and a generation of income account (balancing item: operating surplus) replaced the SNA production account. The income and outlay account was replaced by a distribution of income account (balancing item: disposable income) and a use of income account (balancing item: saving). The capital finance account, split in two in the SNA, was replaced in the ESA by a capital account (balancing item: net borrowing or net lending) and a financial account (balancing item: net changes in financial assets). The French practice of estimating accounts in volume terms using prices of the previous year was not included. Neither the SNA nor the ESA adopted this practice at that time. They continued to recommend calculating estimates at constant prices of a fixed base-year, until the 1993 SNA move to chain indices.

The main weaknesses of the SNA/ESA remained the absence of balance sheets; fixed capital formation was limited to tangible assets; and the relationship between income and wealth was not fully shown.

However the 1968 SNA/1970 ESA systems of national accounts moved from an approach focused on aggregates to an approach recognising the importance of the accounts themselves.

The 1993 SNA/1995 ESA

A quarter of a century later, a third generation of international standards in the form of the SNA 1993/ESA 1995, finally completed the accounting framework. Full-scale balance sheets were included. The accumulation accounts were completed with the introduction of a revaluation account, recording holding gains and losses, and an account called ‘Other changes in volume of assets account’, which recorded other types of capital gains and losses. This completion of the accounting structure clarified the relation between income according to the SNA/ESA and changes in wealth (net worth): in addition to the change in net worth due to saving, changes in net worth due to holding gains/losses and to other changes in volume of assets were taken into account.

It is worth noting the explicit presentation of the quadruple entry principle of recording followed by national accounting.

The completion of the accounting structure did not mean that the coverage of capital formation was exhaustive. Intense discussions dealt with the issue of recording some service expenditures as gross fixed capital formation in intangibles rather than as
current transactions. The significant result was that intangible capital formation was accounted for, but only partly. Computer software, literary, artistic and entertainment originals, and mineral exploration expenditures were included in the asset boundary. But there was strong resistance to the idea of including R&D expenditures in GFCF. After having been accepted in March 1988, regrettably this inclusion was rejected in December 1990. It was not until the adoption of the 2008 SNA/2010 ESA that R&D assets were included in the asset boundary of the national accounts.

Another step forward in the 1993 SNA was the introduction of work-in-progress for services.

In the 1993 SNA/1995 ESA, the current accounts were more detailed than before (the 1968 SNA had been criticised for neglecting the analysis of income). A larger number of significant balancing items concerning income were shown. Accounts showing primary income distribution, secondary distribution and redistribution-in-kind appeared. Between operating surplus and saving, accounts showed the balancing items of entrepreneurial income (when relevant), the balance of primary incomes, disposable income and the adjusted disposable income (for social transfers in kind from government to households, such as certain social security benefits, health and education services, etc.). Actual final consumption was thus differentiated from final consumption expenditures.

One important aspect of the increasing wide use of the international system was the extensive involvement of five international organisations (the United Nations, the European Commission, the International Monetary Fund, the World Bank and the Organisation for Economic Cooperation and Development) in the preparation of the 1993 SNA. The 1993 SNA thus became a shared standard among the five organisations and this reinforced its status.

The participation of the IMF should be particularly stressed. The Fund was from the beginning responsible for the international guidelines on government finance statistics and balance of payments statistics, later on also on monetary and financial statistics, that is, an important part of the economic flows which the SNA covered. However, there were many and significant divergences between the overlapping recommendations included in these various sets of guidelines. The resulting inconveniences had increased as the international relationships had developed at the world level. Finally, the IMF entered fully into the harmonisation process between the SNA and the Fund’s manuals on Balance of Payments (complete harmonisation, with the exception of some details, with the 1993 Manual of BOP), on Government Finance Statistics and on Monetary and Financial Statistics.

On the other hand, the close involvement of Europe meant that SNA and ESA were almost identical.

A major regret at the end of the twentieth century was the position of the USA. Despite the deep involvement of the USA in the preparation of the 1993 SNA, and the important role played by Carol Carson, their move to the new standard was not complete and a gradual implementation was undertaken.

**The central framework/satellites accounts and additional constructs**

The 1993 SNA also introduced additional constructs developed in some countries, in order to broaden the scope of national accounting, without overburdening the fully integrated system itself. In this perspective, the fully integrated system became the ‘central framework’, whereas the System as a whole was made up of the central framework and additional constructs, mostly called ‘satellite accounts’. The idea of satellite accounts originated during the sixties in French national accounting and developed internationally, mostly in fields like health, education, social protection, environmental protection expenditures, etc.

In conclusion, the ‘System of National Accounts 1993’ was both a presentation of the new complete version of the international system and a clear high level manual on national accounting as a whole.
The Material Product System (MPS) comes to an end

Reconciliation between the SNA and the accounting system prevalent in the Soviet Union and its satellites was a complex issue. Around a narrow concept of production and, as a consequence, a larger redistribution concept of national income, Soviet statisticians had developed a ‘System of balances of the national economy’, consisting of an articulated and consistent set of balances, accounts and tables. There were two fundamental balances. The first one described the production, consumption and accumulation of social product (table of supply and use of goods and material services). The other, the balance of national income, later called ‘financial balance’, showed the distribution of primary incomes derived from material production, then the very large redistribution process including the income of persons employed in the non-productive sphere, interest and all types of financial transactions, and lastly, after taking into account the net result of foreign trade, the final uses of material products.

The MPS largely ceased to exist from the beginning of the nineties, after the break-up of the Soviet Union.

Changes in the demand for and uses of accounts

In comparison with the program of the macro representation and measurement of the national economy as a whole, which had emerged during the thirties and the forties, the achievements at the end of the 20th century were beyond the original hopes. However, in the meantime, the economic, social and political conditions in the world had changed dramatically, especially since the mid-seventies. As a result, national accounting had to face new challenges. They are summarized as follows in ‘A History of National Accounting’:

‘Grosso modo, until the first years of the 1970s, the idea of macroeconomic regulation through demand still prevails, even if the economic policy is everywhere a varying combination of different approaches and techniques (the policy-mix). In a few decades, however, many changes occurred. Generally, economies opened up and were liberalised. One speaks of their internationalisation, shortly later of their globalisation. Certain negative effects of growth are under increased criticism. The long-lasting, largely consensual, objective of growth is questioned (some even plead in favor of “Zero growth”, while others have rejected the “consumer society” model). At the same time, many “southern countries” are at pain to promote their development and are unable to control their disequilibria. Individualism is in progress. The productive system (firms, products) becomes increasingly complex.

Transformations accelerate with the first oil crisis. Unemployment soon increases, while at the same time economies see their growth slow down or stagnate and inflation again reaches a two-digit rate in large industrialised countries (“stagflation”). The crisis is structural and the macroeconomic regulation mechanisms break down.

Hence a decline in macroeconomic theories inspired by Keynes and a crisis of macroeconomic models, an increasing preponderance of the neo-classical theories, the weakening of the role of government and the appearance in the foreground of incentive policies based on microeconomic behaviors in a neo-liberal type of approach.

In the new context of the last quarter of the century, national accounting does not seem to be supported any longer by the Keynesian paradigm and will suffer from the discredit of the latter. Some will even consider that it has been overtaken. Nevertheless, the demand for national accounts continues to increase and, as a discipline, from the 1968 SNA/1970 ESA to the 1993 SNA/1995 ESA, national accounting makes considerable progress. The uses and requests that are addressed to it know notable transformations, and stress different aspects, while at the same time new requirements appear that are difficult to satisfy’. ‘A History of National Accounting’, 2005, pp. 446-447.
Short-term economic analysis and quarterly accounts

The primacy given to short term economic analysis gave rise to an increased demand for quarterly accounts. Timeliness was an important characteristic of their usefulness, with a tendency to focus on preliminary figures without attaching enough importance to their accuracy. There was a danger that short-term trends analysis would be preferred to structural information and research based on final annual accounts.

This was avoided for various reasons. The first reason was that the scope of economic research and analysis using national accounts data and possibly their methodologies had developed well beyond the field of short term Keynesian equilibrium policies or medium term development planning using input-output analysis. For instance, economic growth and multifactor productivity measurement had become pervasive, often in the context of international comparisons. Such comparisons had even given rise to a new branch of price measurement in the international sphere, purchasing power parities estimates. Inside countries, in particular very large countries but also medium size or sometimes smaller countries, the request for regional accounts had become frequent in relation with internal inequalities; although the actual estimates of rather comprehensive regional accounts or at least some regional aggregates, like GDP or regional income, remained partial.

A second reason was that the coverage of quarterly accounts did not remain as restricted as feared, because quarterly models were increasingly elaborated and used for short term forecasting (up to two years or so ahead). Such models needed to cover such items as household income and consumption, business saving, government receipts and expenditures. This led progressively, with many differences in practice among countries, to the building of quarterly accounts for institutional sectors such as households and government. On the other hand the goods and services part of the quarterly accounts have often been established in the framework of quarterly input-output tables. It was recognised that the usefulness of quarterly accounts rely on their coherence overtime with the series of final annual accounts. This requires quarterly accounts to be benchmarked to the results of annual accounts for earlier periods, before current quarterly estimates are made.

The institutional role of national accounts develops, especially in Europe

A third reason that timely quarterly accounts did not come to dominate the national accounting scene was the considerable extension of the institutional and political role of national accounting, especially in the European Union. In Europe during the nineties, some of the main ESA/SNA aggregates were placed at the centre of political debate with the creation of economic and monetary Union (EMU) and the introduction of a common currency. Most of the criteria used to decide if countries could join the European Union/EMU, the so-called Maastricht criteria from the treaty signed in February 1992, are defined with reference to ESA measures (ratios of public deficit and public debt to GDP). Some time before, in 1988, the fourth resource of the European budget was defined in reference to the aggregate then called GNP. For many years aggregates such as GDP or GNP had been used for administrative purposes. Examples are the calculation of the contributions of countries to international organisations such as the UN, and the determination of eligibility for loans with lower interest rates from the World Bank. In Europe, regional measures of GDP per capita play a significant role in the allocation of financial support. However, the debate around the Maastricht criteria marked a qualitative jump in the importance of national accounting as seen by governments, officers in charge of budgetary and financial matters and public opinion. Since then the figures for the Government deficit and debt for the European Countries have played an important part in the political debate in the EMU, even for countries that are not members of the Euro zone. Beyond Europe, the ratios of government deficit and debt to GDP became a common tool for the
analysis of economic policy in the context of the financial crisis and recession of the end of the first decade of the 2000s.

The development of institutional and political uses in Europe required, beyond the reference to a common accounting framework, an actual harmonisation of the content of the accounts. This was pursued through various mechanisms. The GNP Committee created in 1989 contributed to improvement of the comparability of estimates. It was renamed in 2003 the GNI Committee, following the change in terminology introduced in the 1993 SNA/1995 ESA. The Committee on Monetary, Financial and Balance of Payments statistics (CMFB), created in 1991 shortly before the Maastricht Treaty, played a monitoring role in the procedure concerning excessive deficits. As will be discussed later, achieving harmonisation was not an easy task. Due to its institutional role through adoption as a European regulation, the 1995 ESA became compulsory for the national accounting systems of all Member States. A similar situation has developed in practice at the world level. The monitoring and intervention function aimed at remedying local and regional crises and at preventing the appearance of systemic crises falls on the IMF, in agreement with the principal economic powers. Hence the IMF’s growing role in the supply by Member States of timely and well-documented harmonised information on their national accounting sources and methods. In the last decade of the 20\textsuperscript{th} century, the IMF set up a system of standards to guide countries in data dissemination. Stress was laid on the information (metadata) concerning the characteristics of the data, their quality, their accessibility and their integrity, in the macroeconomic, financial and socio-demographic fields. The synthesising and structuring role of national accounts is particularly highlighted. So considering both the role of the ESA in Europe and of the SNA worldwide, the standardised system of national accounts SNA/ESA really became universal. Virtually every country in the world implemented it. Of course doing it effectively is a different issue. Balance sheets and the accounts of certain institutional sectors remain under-developed.

Part 2 — The present: big challenges ahead.

From both a technical point of view and the viewpoint of its extended uses, the development of national accounting over the last seventy years has been a success. However, the interpretation of its results and the relevance of these results for adequately representing social concerns have been questioned for the last fifty years or so. Very often Gross domestic Product (GDP), considered the key measure of the system, has been on trial, accused of misleading messages on important social issues.

The welfare measurement dispute

The main problem of interpretation is the measurement of welfare. The question for national in compiling accounts for its own purposes, the ESA became de facto compulsory for the national accounting systems of all Member States. A similar situation has developed in practice at the world level. The monitoring and intervention function aimed at remedying local and regional crises and at preventing the appearance of systemic crises falls on the IMF, in agreement with the principal economic powers. Hence the IMF’s growing role in the supply by Member States of timely and well-documented harmonised information on their national accounting sources and methods. In the last decade of the 20\textsuperscript{th} century, the IMF set up a system of standards to guide countries in data dissemination. Stress was laid on the information (metadata) concerning the characteristics of the data, their quality, their accessibility and their integrity, in the macroeconomic, financial and socio-demographic fields. The synthesising and structuring role of national accounts is particularly highlighted. So considering both the role of the ESA in Europe and of the SNA worldwide, the standardised system of national accounts SNA/ESA really became universal. Virtually every country in the world implemented it. Of course doing it effectively is a different issue. Balance sheets and the accounts of certain institutional sectors remain under-developed.

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The welfare measurement dispute

The main problem of interpretation is the measurement of welfare. The question for national accounts is a double one:

\textit{‘Do national income or national product provide a measure of social welfare, Should national accounts attempt to provide such a measure?’}

Attempts to answer the question followed two distinct, though often entangled, directions. The first one is centred on the interpretation of market values, in the strict framework of utility theory, the other on the analysis of the final objectives pursued by economic activity. The work of Arthur Cecil Pigou (The Economics of Welfare, 1920, Part 1-Welfare and the National Dividend) and John Hicks (‘The Valuation of the Social Income, Economica, May 1940) illustrate the first approach, and the work of Simon Kuznets the second one (a

Hicks and the Economica Debate

Pigou’s initial attempt to measure welfare through market values took place in a framework of cardinal utility, and was not successful. Hicks continued the debate initiated by Pigou in a more rigorous conceptual framework (indifference curves and ordinal utility), taking into account the attention paid to the Pareto optimum by The New Welfare Economics at the end of the thirties, in order to circumvent the problem of income distribution. Hicks’ 1940 article triggered an intense debate during the forties and the fifties, essentially between theoretician economists, in which Kuznets participated. After Kuznets (1948), national accountants did not participate in a discussion that grew more and more complex (for an invaluable review on this topic, see Amartya Sen ‘The welfare basis of real income comparisons: a survey’, Journal of Economic Literature, March 1979). Based on this work and the work of Ingvar Ohlson (On national accounting, 1953), A History of National Accounting concluded (pp. 296-297):

‘From this attempt [Hick’s one], and from the long discussion that followed, it is only possible to conclude that, unless assuming very peculiar conditions that do not realistically reflect the states of the economy, it is not possible to translate the observed changes in the sets of goods and services, even strictly limited to market ones, into a measure of welfare, understood as a change in satisfaction or utility for society as a whole. Even the direction of the change, positive or negative, is, strictly speaking, dubious’.

This conclusion seems to have been the position of national accounting for the past seventy years. Hicks concluded in 1975 (‘The scope and status of welfare economics’, Oxford Economic Papers, no. 3):

‘We have indexes of production; we do not have — it is clear we cannot have — an Index of Welfare’.

Kuznets and the end goals of economic activity

Kuznets’ approach was very different from that of Hicks. His view was that national income, as he had calculated it, was not a measure of welfare. However, according to him, the purpose of national income estimates should be the measure of welfare. He argued that the end-goal of economic activity was to satisfy the needs of individual consumers. He thus proposed to include in the field of national income the domestic services households performed for themselves (in contrast, he was much more doubtful regarding the inclusion of leisure). Conversely, he was in favour of excluding from national income everything that did not result in a flow of goods and services to consumers. He thus concluded that the largest part [in his time] of the result of government activities (services provided to producers, but also what corresponds to the preservation and extension of the social framework, public administration, defence, justice, international relations, etc.) should not be included in national income. He also excluded a significant part of consumer expenditures. Beyond rather simple cases such as transport between home and work, he excluded what he called ‘the inflated costs of urban civilisation’ (for instance banking services, trade union dues, costs linked to life in cities or ‘occupational expenses’). For 1929, in the USA, he estimated these inflated costs of urban civilisation represented about 20-30% of consumer expenditure.

What Kuznets excluded from national income as ‘non-final’ expenditures were deemed to be of an intermediate character. It is important to note what this approach meant. ‘Intermediate’ did not mean, as is usual in national accounting, ‘what is used to produce other goods and services’ but ‘what is not used directly for the satisfaction of consumers’. In this approach, a part of economic activities simply vanished.

Finally, Kuznets’ approach to the scope and measurement of national income has not been attractive to national accountants for two reasons. On one hand, it explicitly implied introducing ethical considerations in defining what was
National Accounting at the beginning of the 21st century: Wherefrom? Whereto?

satisfying the needs of individual consumers. On the other hand, with the resulting extended notion of intermediate expenditures, it was not compatible with the concept of an integrated system of national accounts. This difference of views with respect to the measure of national income was one of the reasons why Kuznets and the US Department of Commerce disagreed.

The position of national accountants was clear from the very beginning. The aggregates of national accounts measure economic production and the corresponding income, as well as the different uses (consumption, fixed capital formation, ...) of goods and services that have been generated by production activities. National accountants, since Hicks, stressed that these aggregates were not designed to measure welfare and that changes in volume could not be interpreted as changes in welfare of the society as a whole.

Two streams of research emerged among scholars.

Nordhaus and Tobin ‘measures of economic welfare’ and other indicators

Firstly, from the beginning of the seventies, in the light of the negative implications of economic growth, a remarkable revival of the Kuznets’ approach took place. The most famous study was the experimental ‘measure of economic welfare’ (MEW) elaborated by William Nordhaus and James Tobin and presented in ‘Is growth obsolete?’ (1970). In this approach, the purpose was not to compile an indicator of welfare in the general sense, but to measure economic welfare, or more modestly, the set of goods and services contributing to economic welfare. This was achieved by a series of reclassifications (for instance from government final expenditure to government intermediate consumption or regrettable necessities), additions (mainly household activities and leisure) and subtractions (negative amenities of urbanisation).

Many indicators have been proposed in the following decades. Some have more specific objectives, like the Index of Social Health of the Fordham Institute for Innovation in Social Policy in the late eighties, which is a synthetic social indicator combining ‘physical data’, without any monetary valuation. Some others follow Kuznets, Nordhaus and Tobin, in search of a monetary global indicator with wider ambitions, like the Genuine Progress Indicator, 1995, of the Redefining Progress organisation. The latter is especially interesting due to its coverage. It includes negative adjustments for income inequalities, social costs (crimes, road traffic injuries, family breakings, unemployment cost), environmental costs (diverse pollution costs, environmental degradation), etc. For the US, in 2000, the genuine progress indicator was estimated to be 2630 billion in dollars of 1996, compared to total personal consumption in the national accounts of 5153 billion. The ‘index of economic well-being’ of Osberg and Sharpe, proposed a composite index combining in a non-monetary way, monetary and non-monetary elements.

Weitzman theoretical elaboration

Secondly, a stream of theoretical research dealt with the issue of welfare in the wider context of environmental and sustainability issues. The most quoted paper is the article by Martin L. Weitzman (‘On the welfare significance of national product in a dynamic economy’, Quarterly Journal of Economics, vol. 90, 1976). Weitzman sought to justify an interpretation of net domestic product in terms of both welfare and sustainability. His strict reasoning framework is far from real world conditions: assumptions include that the economy moves along a competitive path, the representative consumer maximises his utility over time, the capital market is competitive with perfect anticipations, the concept of capital is generalised so that all sources of economic growth are identified and attributed to a form of capital. In a later paper (1997), in collaboration with Karl-Gustaf Löfgren, the very restrictive 1976 assumption of absence of technical progress was dropped.

GDP on trial

Towards the end of the 20th century and in the beginning of the 21st century, a passionate public
debate developed on the limitations of the system of national accounts as provider of measures of economic performances, social progress and sustainable development. Unfortunately, there was an excessive focus on a single measure of production, namely GDP. A dispassionate analysis of the questions concerned did not take place. This was partly due to the fact that, in comparison with previous decades, the knowledge of national accounting beyond the circle of national accountants was limited.

In spite of national accountants’ repeated statements that the purpose of GDP or NDP was not to measure welfare, much effort had been expended by analysts to ‘demonstrate’ that GDP was not a relevant tool to measure welfare/well-being. In fact, what many critics had in mind was to question the place given to economic growth and consumption in the concerns of our societies, as well as the damaging consequences for the natural environment and people’s well-being. The debate has been transferred from a criticism of society’s goals to a debate on the measuring tool of the production aggregate.

It is true that, during the long process of extension and harmonisation of the national accounting framework, the substance of the accounts changed dramatically from the original focus on national income. The aggregate product became the most important one, on a par with the expenditure aggregate. The income aggregate not only lost the position of being the primary aggregate, but also was often given a secondary position. People continued to speak of ‘three approaches to the measurement of GDP’, similarly to the ‘three approaches to the measurement of national income’. This was unfortunate. Actually Gross Domestic Product (GDP), Gross National Income (GNI), and ‘Gross National Expenditure (GNE) are three different, though interrelated concepts. Each of them can be the most relevant one depending on the circumstances. For instance the Fourth resource of the European communities’ budget is based on GNI. In the Maastricht criteria GNI was arguably more suitable than GDP as the denominator of ratios such as the government deficit and debt ones.

Clarification by the Stiglitz, Sen, Fitoussi Report

Clarification was provided by the Commission on the Measurement of Economic Performance and Social Progress, created in February 2008 following a request by the President of the French Republic, at that time Nicholas Sarkozy, and whose report, properly known as the Stiglitz-Sen-Fitoussi Report, but usually referred to as the Stiglitz Report, was issued in September 2009. The main points of that report will now be considered.

Terminological issues: ‘well-being’ or ‘quality of life’ vs. ‘welfare’

The first point is related to the terminology used in the report. The report has as a central concept ‘quality of life’ or equivalently ‘well-being’. The term ‘welfare’ is generally avoided in the report. Indeed, in recent decades, the term ‘well-being’ has been increasingly used to convey a rather different meaning than the traditional term ‘welfare’ in economics. Unlike welfare, the term ‘well-being’, as used in research work (see for instance Osberg and Sharpe), does not propose an aggregated measure in monetary terms through modifications and complements to the national accounts income or consumption aggregates. The report does not strictly speaking define ‘quality of life/well-being’. Instead it talks about the multi-dimensional character of what gives life its value, taking into account all its complexity in answering the question: ‘What is quality of life?’

Essential distinction between means (resources and other means) and well-being

From the perspective of the present paper, the crucial point in the report is the essential distinction drawn between means and well-being.

Means include resources. They include marketed and non-marketed resources whose estimates in monetary terms, for instance through contingent valuation procedures, will differ across individuals. Many determinants of well-being are aspects of people’s life-circumstances (health, social networks, quality of institutions, quality of paid work, leisure
time and personal activities, etc.), which cannot be described as resources with imputable prices, even if people do make trade-offs among them.

Well-being is the result of the transformation of the whole means referred to above. Means are transformed into well-being in ways that differ across people.

Translated into the national accounting language, the position of the Commission set out in the above paragraphs (see p. 41, part I, chapter 2 of the report) can be reworded as:

‘GDP, or National income or Final consumption belong to the domain of means, not of results in terms of the measurement of well-being’

**Focusing on well-being indicators**

In addition to the clarification showing that most of the recent ‘welfare dispute’ around GDP was misguided, the report’s conclusion meant that it was not possible to avoid the problem illustrated in the seventies by the social indicators movement. Let’s simply recall that multiple social indicators then appeared to be necessary; and that no simple way existed to derive from them any composite aggregated welfare indicator avoiding ethical choices. Similar conclusions are valid for the measurement of quality of life/well-being in the recent ‘Beyond GDP’ movement. Concerning the developed countries, the main initiatives taken over the past few years have been by the OECD. In 2011, the OECD launched a ‘Better Life Initiative’. The purpose is to combine data and research in order to provide the first collection of internationally comparable well-being indicators tailored to the needs and concerns of developed countries. This initiative is explicitly based on a framework drawn from the Stiglitz Report. The coverage is worldwide, proposing a core set of universal well-being dimensions that could be adapted to the priorities of different countries and regions of the world. The 4th OECD World Forum on Statistics, Knowledge and Policy was organised in October 2012 around the topic ‘Measuring Well-Being for Development and Policy making.’

**Making better use of modern national accounting potentialities: accounts are important, not only aggregates**

On accounting issues, a great merit of the Stiglitz Report was to recommend making better use of modern national accounting through an understanding of what the SNA/ESA covers. Stressing the potential uses, especially for the assessment of standards of living (on the side of resources/means), was particularly important because the knowledge of the SNA/ESA is generally limited among economists, and its implementation by statistical offices is often partial.

The Commission emphasised the diversity of aggregates in the present national accounts, specifically aggregates net of fixed capital consumption, like NDP or, more in line with the Commission’s perspective on standards of living, the net income and notably the net national disposable income and the real net national disposable income which takes into account the changes in the terms of trade.

Where the Commission recommended focusing on the household perspective, it stressed the importance in the SNA/ESA of the accounts themselves and the accounting structure, beyond the aggregates of most public interest. The Commission recommended implementing elements of modern national accounts that many countries do not yet have. Attention was brought, not only to the disposable income of households, but also to actual disposable income and actual final consumption, two new concepts introduced in the SNA 1993/ESA 1995. These concepts take into account in the redistribution process: social transfers in kind received by households, primarily from Government, for instance in the case of education and health services. These concepts allow a better representation of standards of living, which is significant for internal comparisons within a country and even more for international comparisons, such as between Europe and the US.

Also on living standards measurement, the Commission recommended measuring in a standard way the sporadic estimates made in the
past of the non-market households’ production of services for own use (rendered to other members of the household). For many years, there has been no objection in principle from national accountants to carrying this out in a satellite account. The issue is to include it as part of a regular program of work, occurring once every five years.

In contrast, assigning a monetary value to leisure and including it in income and in production as well as in household final consumption remains a challenge even for a satellite account. There are different views expressed in the Commission Report. Chapter 1 of Part II (see paragraphs 128-129) sets out arguments for assigning a monetary value to leisure, whilst giving due weight to the difficulties of measurement. Chapter 2 of Part II (top of page 212) is more negative about this idea (I personally share this second view).

**Household accounts by sub-categories and distributional considerations**

Much more importantly, with regard to households, the Commission strongly underlined the importance attached to measures of the distribution of income and consumption, so as to better assess the standards of living of the population. Considerations on distribution, inequality and equity were also a recurring theme in Chapters 2 on quality of life assessment.

Traditionally, national accounts deliver results concerning the household population as a whole or, very rarely, some of its major sub-groups, whereas the micro data of household statistical surveys enable distributional analyses, but results for the whole household sector are less exhaustive than those of national accounts.

Reconciling and integrating micro data and macro results is thus a promising and difficult challenge for both household survey statisticians and national accounts compilers. Fortunately, an ambitious work in this area was undertaken some time ago in France and demonstrated the feasibility of such a project (results for 2003 published in 2009 (1)). Following the Commission’s recommendations, the OECD and Eurostat are developing an international program of this kind. Articulating the distribution of income and consumption with the distribution of wealth through household balance-sheets is an essential dimension to be considered.

As this type of work is extremely burdensome and complex, it would probably be unrealistic to expect results every year. A five-year or at most three-year interval program seems more reasonable.

**Sub-sectoring the market sectors of enterprises?**

Paradoxically, market enterprise sectors are at risk of becoming neglected in current national accounts. I use the word ‘paradoxically’ because modern societies are characterised by a prevalence of market economic activities and the fact that businesses, especially big businesses, play a leading role in economic innovation and competition. This follows recent developments giving prominence to government accounts at various levels and to household accounts with subcategories for analysing income and wealth distribution, standards of living and consumption and, beyond national accounts figures, well-being/quality of life.

There is a need to present the accounts of market enterprises at a sub-sector level, and to articulate the micro and macro levels. This has been an outstanding issue for a long time. French national accounts published such accounts in the past. This was achieved thanks to the existence in France of official business accounting standards facilitating the comparability of micro business accounts and official statisticians having access to the individual data held by the income tax administration.

the UN undertook a methodological analysis of the establishment of corporations’ accounts, mainly non-financial corporations. In spite of some very good UN publications, there was no response to this initiative.

The lack of an immediate reaction is partly due to the fact that the issue had become more complex. There are, at least, three types of problem: a problem of business accounting standards, a problem of statistical units and a more general problem of representation of the working of the globalised production system.

International business accounting standards have developed and have been officially adopted in Europe at the level of groups of corporations. When they are applied to independent corporations or unincorporated businesses, there may be inconsistencies between national business accounting standards and those of the International Accounting Standard (IAS)/International Financial Reporting Standards (IFRS),

At the same time, the relevant institutional statistical unit at the enterprise level has been reshaped, or is in the process of being reshaped in many countries, moving away from the notion of legal entity unit towards a more economically significant unit that results from the breakdown of a group of corporations between a number of operational divisions, whatever their formal legal structure may be.

While this type of breakdown, at a kind of ‘meso’ level, is necessary to analyse the economic behaviour of businesses, it is a big challenge for national accounts not to lose in this process the possibility of observing the elementary flows associated with the technical characteristics of the production system. This problem is not new. Traditionally, in national accounting, if there was a well-specified articulation in the system, between the working of functional ‘establishment type’ statistical units in the production process and the role of ‘institutional type’ statistical unit in the process of income distribution and wealth accumulation, this articulation remained basically formal. In the light of globalisation, there is a need for a more integrated representation and analysis, taking into account both technical and financial interrelationships.

Indeed, as production, trade, accumulation and consumption become global activities, the overall challenge for national accounting (see below) is how to adequately represent and measure this process reflecting the global and national, technical and financial dimensions.

**Facing a changing world**

At the very beginning of this paper, I stressed the remarkable achievements of national accounting since the eve of the Great Depression. This judgment is certainly valid in absolute terms and in relation to the state of the national economies as it was during the decades immediately preceding and following World War II. However the world economy has changed significantly since then.

Firstly, the economic characteristics of nations have evolved radically in terms of institutional structures; functional mechanisms; sets of goods and services supplied and used in the context of continuous innovation; the respective roles of tangible and intangible assets in capital formation; financial arrangements becoming more complex and extensive; and increased liberalisation.

Secondly, the interdependence between national economies and the increasing role of multinational corporations questions the significance and feasibility of the partition into national economies.

Thirdly, the interactions between economies and the state of the natural environment have received more attention. Initially, the main concern was the depletion of natural resources, especially non-renewable resources. Progressively however attention became focused on the degradation of natural assets, including shared world assets such as the climate, and the resulting consequences on the services provided by the various types of ecosystems, and more generally on the sustainability of development and human life.

If the achievements of national accounting are judged in terms of these changes in the state of the world economy and the emerging focus
on environmental and sustainability issues, the assessment is less satisfactory. The relevance and quality of the representation and measures offered by the national accounts must be assessed according to the type of issues concerned.

**Adaptation capability**

To a large extent, improvements in the various versions of the SNA/ESA Central Framework were to better reflect the core system of economic transactors and transactions, and the evolution of economic life at the level of national economies and their relationship with the rest of the world. The main improvements have covered the following:

- **dual approach**: institutional units and sectors on one hand; establishment-type units and industries on the other hand;
- **distinguishing market and non-market industries and products**;
- **the classifications of activities and products reflecting the increasing complexity of the product-mix in economies**;
- **more detail on the distribution of primary income and redistribution of income, including social transfers in kind**;
- **extension of the asset boundary to include intangible assets**;
- **the importance given to the analysis of financial institutions and financial accounts**;
- **the inclusion of balance sheets and completion of accumulation accounts in order to show adequately the relationship between income and changes in net worth**.

Certain issues have been difficult to solve and a step-wise process followed. This was particularly the case in the definition and measurement of the output and uses of insurance services, and financial intermediation services not directly charged to customers, that have to be indirectly measured. These questions were on the agenda of all versions of the SNA/ESA.

Some issues remain unsolved for the time being, and three of them deserve to be mentioned.

The traditional treatment of education expenditures is to classify them as current expenditures in the SNA/ESA. Would it be possible to imagine for education a treatment parallel to the one now given to Research and Development expenditures and the corresponding assets in the 2008 SNA/2010 ESA? In other words, could a concept of ‘educational capital’ be introduced, leaving to a possible satellite account the aim of measuring human capital as understood by economists?

Another unsolved issue, in spite of the limited progress achieved since the Atkinson’s Review recommendations (2004), is estimation of the volume change of the output of government non-market services based on indicators of output, even if the current value of these services is measured as the costs of inputs. Progress in this direction has been limited to education and health services, where similar problems have to be solved for both market and non-market services. No comprehensive solution of this issue seems near for national accounts.

Last, but not least on a conceptual basis, is the issue of the services that are apparently delivered to people free of charge and are financed generally through advertising expenditures. Flows of this kind have grown enormously with the expansion of the information technology and the internet social communication systems that now flourish.

To my surprise, military durables such as weapon systems have been included in the asset boundary according to the 2008 SNA/2010 ESA, giving rise to GFCF expenditures, asset accumulation and consumption of fixed capital. During the half century from the forties to the eighties when national accounting was ruled by successive versions of the international standards, there was general acceptance that all military expenditures should be treated as current consumption expenditures. Balance sheets compilers possibly recorded stocks of military durables as a memorandum item in their tables. When transactions in second-hand military durables were observed, marginal entries were recorded in order to allow for the financial flows generated by such transactions.
Though the concept underlying the initial SNA treatment does not seem to have been set out, it seemed obvious at the end of World War II: military activities require the use of economic resources that are no longer available for non-military economic activities; those resources are part of the final collective current uses of goods and services.

However, during the nineties, another analysis was promoted and ultimately introduced in the 2008 SNA. It was based on two arguments. One is trivial: if military durables exist and are in used for more than a year, they are assets. The second one argues that military durables are fixed assets engaged in the production of national security or more precisely deterrence. I believe that the latter argument is based on confusion between a service as part of the output of goods and services in the SNA/ESA sense and a function which is linked to the purpose of expenditure in the SNA/ESA sense of the functions of government or household expenditures.

This innovation in the SNA/ESA is ill-advised. It does not add anything to the analysis of economic activity and, on the contrary, it will be a source of confusion. The crucial question is to decide if military operations in which weapon systems are actually used can be considered processes of production in the SNA/ESA sense. My answer to this question is definitely ‘no’. I submitted a full set of arguments, and they can be found together with a response from a member of the Advisory Expert Group for the SNA 2008, on the United Nations website (http://unstats.un.org/unsd/nationalaccount/AEG/comments/m1%28c%29uk.pdf). The case for the inclusion of military equipment in GFCF was set out for instance in a paper by Brent Moulton of the US BEA (The system of national accounts for the new economy - what should change? RIW June 2004) (*)

My view is that in order to provide an extended analysis of military expenditures and activities, beyond the few figures featuring traditionally in the Central Framework, this objective would have better be pursued by designing a satellite account for military activities. A nice opportunity was lost to use the accounting system as a whole and its flexibility, without overburdening and confusing the Central Framework itself.

A similar remark can be made in relation to a different issue raised during the preparation of the 2008 SNA. It was sometimes proposed to include total factor or multifactor productivity estimates in the SNA Central Framework, more specifically in the sequence of accounts itself. A more limited proposal was to include only capital services as an entry in the central accounts, not to include a proper measure of multifactor productivity (this issue is discussed in the paper by Moulton referred above) Productivity estimates and analysis use the concept of capital services, derived from a theoretical approach, whilst the SNA traditionally makes use of a more neutral and descriptive terminology, such as gross operating surplus and then property or entrepreneurial income. Finally nothing was changed in this respect in the central framework by the 2008 SNA. It is proposed (chapter 20) that ‘for those offices interested, a table supplementary to the standard accounts could be prepared to display the implicit services provided by non-financial assets’ (§20.1) I do not contend the use of the concept of capital services in productivity measurement. The question is whether productivity measurement, notably multifactor productivity measurement, belongs to the field of ‘observation’, or the field of ‘analysis’.

The puzzle of globalisation

The globalisation of the world economy has raised more complex issues than are met when analysing national economies. Some problems had been identified before the concept of globalisation became prevalent during the last decades of the 20th century. They were linked to the behaviour of multinational enterprises, their changing organisational arrangements and the issue of transfer prices being different from market prices to minimise taxation of profits. With the liberalisation of international economic flows and countries like China increasing their role on the

In national account terms, globalization is the process of replacing national economic structures and transactions by international ones. Corporations organise their production and marketing at a global level, with vertical production processes spanning several countries (paragraph 1.2).

The world economic scene, the scale of the problem expanded enormously. As a recent UN publication (‘The impact of globalization on National accounts’, 2011), strikingly stated it:

One should not forget either that the process of globalisation also covers financial structures and flows, ‘special purpose entities’, and tax havens abroad, all of which play a significant role.

This UN publication resulted from the work (2007-2010) of a United Nations Economic Commission for Europe (UNECE) led Expert Group on the Impact of Globalization on National Accounts (GGNA). Two linked approaches are considered. On one hand, the accounts of multinational enterprises are analysed, setting out the difficulties in allocating output, value added and income flows to national economies. On the other hand, issues concerning trade in goods and services (goods sent abroad for processing, merchanting, international transactions in intellectual property products) and the combination of corporate activities in what is now called ‘global manufacturing’ or ‘global production’ (including the issue of ‘factoryless’ production) are considered.

This extremely useful book illustrates very well the huge challenges that national accounts are nowadays facing in respect of the globalisation process. For national accounting purposes, the complexity of the problem has been increased by certain important changes introduced by the 2008 SNA as compared to the 1993 treatment. The 1993 SNA, followed the same principle of previous international standards with respect to external trade statistics; that is, imports and exports of goods are recorded when they physically cross the border of an economy, even when there is no associated change of ownership. At that time, the IMF accepted this solution, different from the change of ownership principle. The convention was adopted that where goods were exported for processing abroad, a change of ownership was imputed. The rationale behind the 1993 SNA/BOP treatment was to give priority to the consistency with the existing national accounts input-output tables and analysis, where reflecting physical processes was a high priority. Substituting the physical crossing of the border principle by the change of ownership principle as decided by the 2008 SNA has large implications for the definition and measurement of external trade in goods and external trade in services respectively, and for the representation of production activities.

The criterion of the ownership of materials used in the SNA 2008 and BPM 6 raises a number of issues. For instance, according to the UN 2011 publication, the USA concluded that ‘A strict adherence to the international recommendation to classify FGPs [factoryless goods producers] according to ownership of materials is impractical’. Was such an abrupt change necessary given the consequent breaking of national accounting input-output series over time? The arguments in the 2008 SNA (see paragraphs 14.37 to 14.43) that suggest the physical or technological process of production has lost its importance are not convincing. They seem laborious and tell only part of the story; for example environmental concerns require the physical processes to receive increased importance.

Reading the 2011 UN publication on Globalization reveals that such an analysis would have been desirable well before taking the far-reaching decisions to move away from the long tradition of practice followed by the SNA/ESA. In the process of long-term national accounts improvement, a phase of experimentation can be very useful, or even compulsory, when the decisions can change main features of the System of Accounts.

Turning to the challenge ahead, tackling the big issues calls for extensive international cooperation and exchange of data and experience. Ideally the objective would be to build up the accounts of multinational enterprises at the world level and then allocate building blocks to the relevant national economies. This, perhaps utopian view, requires strong pressure from governments and society at the world level.

Beyond solving the difficulties that globalisation
brings to building the national accounts of countries, there is another challenge to be met. National accounting can also provide a representation of the globalisation process and its main aspects. Steps in this direction have already been achieved through recent statistical research, notably regarding value added chains in world trade. The purpose of such a representation would be to cover adequately the main relevant aspects of globalisation, both physical and technical, organisational and financial, and the associated control mechanisms. It could not be attempted inside the limits of the Central Framework of the 2008 SNA. A set of interrelated accounts and matrices are necessary in order to enable ways of looking at the economic and social reality. Matrices of world trade could be produced according to various criteria:

- the traditional one of the physical crossing of a nation’s borders;
- according to the change of ownership criterion;
- according to the chain of value added analysis; and
- according to the carbon content and/or other significant environmental variables.

Labour force accounts, drawn up according to the educational qualification of people and their geographical distribution, could be built up at the world level. In the context of this global statistical and accounting analysis, purchasing power parities (PPPs) probably would be used intensively. More generally the estimates and analysis of international prices require improvement.

The relationship between the economy and nature and sustainability issues

The relationship between economic activities and the natural environment has posed another challenge for national accounting for decades. Raised at the beginning of the seventies, essentially in relation to the extraction and use of non-renewable resources, it later on extended to the degradation of natural assets and became prominent in the context of climate change.

In the field of national accounting, the problem has been on the agenda since the publication, in 1993, of the first version of a UN Handbook 'Integrated Environmental and Economic Accounting', generally referred to as the SEEA. A second version was published in 2003 jointly by the UN, the European Commission, the IMF, the OECD and the World Bank. The first volume of a third version was finished in 2012, and a consultation draft of a second volume on ecosystem accounting was circulated by the end of the same year. This second volume was presented to the UN Statistical Commission in February 2013. If some parts of the information system for the environment have been well developed, for instance the satellite account on the environmental protection expenditures, very little has been carried out to date in terms of implementing the main approaches of the SEEA as such. This situation illustrates the complexity of the issues raised.

Extraction of natural resources

The issue of how to handle the depletion of non-produced, non-renewable natural resources through the extraction process should have been solved in the SNA/ESA Central Framework itself, even before environmental concerns were raised. Market prices for the extracted resources at the well-head generally existed. From those transaction prices, the resource rent included in the market values (later on described as the intrinsic value of the natural resource ‘in the ground before extraction’) was computable and the question could have been asked ‘how should this rent be treated in national accounts?’ However the full market value of the extracted resources was included in the output of the concerned economies, without any adjustment made to GDP or NDP or both. There was unease that something was recorded as production, contributing to GDP when the counterpart of the extraction was a decrease in the stock of assets, that is, the wealth of the extracting economies. Nevertheless all versions of the SNA/ESA, including the 2008/2010 ones, kept the resource rent included in both GDP and NDP.

There were basically two options to proceed. The first
one, which I promoted, was to treat the extracted part of the natural resource as the disposal (sale) of a slice of an existing asset by the owner to the extractor. This would reduce both GDP and NDP by the amount of the intrinsic value 'in the ground' of the extracted quantities. A number of related accounting adjustments would have to be done. The second option was to treat the depletion amount analogously to the consumption of fixed capital, reducing NDP, but leaving GDP unchanged.

This second solution is the one presented in the first volume (SEEA Central Framework) of the SEEA 2012 (see Table 6.2.3 SEEA Central Framework sequence of economic accounts, p. 224). Gross Value Added, GDP and Gross operating surplus are unchanged from the traditional SNA/ESA, whereas all the traditional net balancing items and aggregates, calculated by deducting the consumption of fixed capital from the gross values, are further adjusted downwards by deducting also the depletion of natural resources.

Most probably this issue will be put on the research agenda for a future SNA/ESA revision. It will be necessary to decide between the two options above.

Bio-physical environment — Ecosystem services and assets

Accounting for natural resources that can be ‘extracted’ raises some difficult issues. However it is facilitated by the type of natural resources in question (physical goods) and the availability of transaction prices.

Other aspects of the relation between economic activities and nature are much more difficult to account for. On the one hand, the bio-physical environment delivers free of charge ecosystem services to both economic producers and final consumers. On the other hand, excessive pressures exerted by production or consumption economic activities, beyond the regenerating capacity of nature, can result in the degradation of the bio-physical environment. In turn, a degraded bio-physical environment loses part of its capacity to provide the economy with ecosystem services. Regarding the whole body of the relations between economic activities and the natural environment, there has been a long debate about what national accounting should do. What should be measured in physical and/or monetary terms, in order to integrate economic and environmental accounts?

From the beginning, compilers of national accounts have been very cautious about extending monetary estimates to phenomena in all fields of human concern (economic, natural, human, social) where there are no observable prices. In contrast environmental economists have suggested methods that permit estimates of monetary values for both non-market services delivered by the environment and the natural assets providing them.

Progressively during the last two decades, the focus has moved from the assessment of the degradation of natural assets in physical terms, as in the Millennium Ecosystem Assessment (MEA), to the measurement of ecosystem services, in monetary terms, as in the project ‘The Economics of Ecosystems and Biodiversity (TEEB)’, and therefore of ecosystem assets themselves.

The crucial issue however is to know if the so-called monetary estimates resulting from this type of research work are compatible with the market/transaction values on which the SNA/ESA is based and with which the SEEA aims to be consistent. In other words, can these estimates be considered ‘transaction value equivalents’?, which is a necessary condition to combine them with SNA/ESA values.

Moreover the attention given to the concept of sustainable development, beyond the concept of economic growth as currently measured by GDP, led most economists to stress the necessity of putting the analysis and measurement of sustainability in the framework of the extended wealth approach, covering both all types of capital/assets (produced, natural, human, social) and all types of income/services from these assets. Actual implementation of the extended wealth approach to the measurement of capital can be step-wise and focused on changes in wealth, as in the adjusted net saving calculated by the World Bank, or aiming directly at a full coverage of the value of the stocks themselves, as in the recent ‘Inclusive Wealth Report 2012’. This latter report is intended to be
National Accounting at the beginning of the 21st century: Wherefrom? Whereto?

the first of a biennial series. In all cases however the coverage remains partial.

In the light of this research and political governance issues, what are the implications for the future of national accounting? Most probably, decision-makers or opinion builders in international circles hope that national accounting will be in a position to elaborate and actually estimate ‘sustainable net domestic product (SNDP)’. In the context of the research work referred to above, many environmental economists encourage such expectations when they propose adjusting national accounting figures, either in the direction of sustainability analysis or more modestly in producing national accounting aggregates ‘adjusted for the environment’, as the 1993 SEEA described it. Other economists seem well aware of the insurmountable obstacles that national accountants would face if trying to currently estimate sustainable aggregates that depend on long term complex modelling (see the Stiglitz Report). They do not underestimate the difficulties to be solved when trying to measure the relations between the economy and nature at the macro level. Hence the very cautious conclusions of the Stiglitz Report. After having stressed the point that, in the context of sustainability assessment, ‘we need projections, not only observations’ (p. 263), the report goes on to say that 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). The Commission recommends a dashboard on sustainability with a number of monetary and physical indicators.

SNA/ESA possible extension of the central framework: the degradation of natural assets?

Considering that estimates in monetary terms for ecosystem services and assets should be compatible with the market/transaction valuation principle of the SNA/ESA/SEEA, is it possible to imagine an extension of the present SNA/ESA that would include a representation of important aspects of the relationship between the economy as it is portrayed in the standard national accounts and the natural environment?

My own view is that, apart from the simpler question of the extraction of market natural resources, priority should be given to the estimation, both in physical and monetary terms, of the degradation of natural assets due to production and consumption activities. This is on the one hand a crucial aspect of the relationship between the Economy and Nature. On the other hand, estimating the costs of avoiding the degradation or restoring the degraded natural assets, although difficult, provides transaction value equivalents compatible with the SNA/ESA/SEEA valuation principle.

The 1993 SEEA proposed to treat these ‘imputed maintenance costs’ as additional consumption of fixed capital, reducing NDP. Such a solution was generally rejected because making an ex post static adjustment of this kind was judged inappropriate. It was thought that adding costs of production implied a change in the price system and consequently in the system of quantities, etc.

A better suggestion consists of leaving the SNA/ESA costs of economic production and GDP/NDP/disposable income unchanged on one hand, and adjusting the value of final demand on the other hand, in order to incorporate in the latter the estimated value of the current degradation of natural assets due to economic activity. The next section discusses this further.

An accounting suggestion

In contrast with the usual representation that treats nature as a part of an enlarged economy, in this suggestion ‘Economy’ and ‘Nature’ are thought of as two different entities, included in a super-entity called ‘Planet’.

To start with, I shall consider a closed Economy. Suppose the annual amount of the degradation is estimated by the costs incurred in order to avoid it or restore the degraded natural assets. Let’s call these costs ‘unpaid ecological costs’. ‘Unpaid’ means that these ecological costs are not included in the ‘paid economic costs’ of the SNA/ESA flows of goods and services. If we add the unpaid ecological
costs to the paid economic costs on final demand, we get the final demand valued at ‘total costs (paid economic costs ‘plus’ unpaid ecological costs)’. As long as degradation of natural assets occurs, the value of final demand at total costs according to this definition is greater than the SNA value of final demand. So the saving of the Economy is reduced by the amount of the unpaid ecological costs. To rebalance the accounts, a capital transfer is recorded from Nature to the Economy, equal in value to the unpaid ecological costs, that is, to the value of the degradation of natural assets. In the balance-sheet of Nature, this degradation is recorded as a stock of negative natural assets. The accumulation overtime of these negative natural assets is a measure of the ecological debt of the Economy towards Nature. In the accounts, capital transfers in the other direction, that is, from the Economy to Nature can occur if previously degraded natural assets are restored by the Economy, the ecological/environmental debt varying accordingly.

In open economies, international flows of unpaid ecological costs have to be taken into account, as well as domestic, foreign and global Natural assets. Estimating these unpaid ecological costs is not an easy task, of course. It would be especially useful for environmental policies if these costs were allocated between the different products composing final demand according to their direct and indirect degradation of natural assets.

The accounting design proposed above is simple; a full-scale implementation at the world level would be a very complex task, requiring extensive international cooperation. The purpose was to suggest a way of extending the SNA/ESA in order to incorporate crucial figures describing the relationship between Economy and Nature, without entering the debate on controversial measures, such as valuation of the whole of ecosystem assets. The core representation of the ‘Economy’ according to the SNA/ESA is not changed in the above proposal. This would allow the extended Central Framework to show both the usual measurement of growth, a generally required current aggregate of production, and a crucial aspect of the relationship between economic activities and natural assets.

Leaving aside the issue of practicality and feasibility of the approach, the main objection to this approach may be that it is not in line with the extended wealth approach favoured by economists. However, the approach is not in fact inconsistent with the concept of extended wealth. The focus here is on the degradation of natural assets, that is, a change in the state/stock of these assets instead of on the stock of ecosystem assets as a whole. Admittedly the suggested measurement method can be judged heterodox, as it does not propose to measure the degradation of Nature by the value of the loss in the ecosystem assets capacity to provide ecosystem services. However one can put the question ‘Is the standard economic approach to the measurement of the value of capital fully relevant, both conceptually and in practice, to the valuation of ecosystem capital/assets?’ Additionally it can be argued that the maintenance cost method is also a measure of the loss of capacity to provide ecosystem services, looked at from the supply side in transaction value equivalents.

What is the outlook for ‘integrated environmental and economic accounting’? Tensions between ‘observation’ and ‘analysis’

At this stage, it is difficult to guess what will be possible in the future of ‘integrated environmental and economic accounting’.

Full integration, including complete ecosystem monetary accounting, in a future version of the SNA/ESA, seems out of reach. Partial integration may be possible depending on the priorities chosen and the level of ambition. A suggestion in this direction was presented above.

In current national accounting work, methodological reflection is necessary in order to better analyse the process of internalisation of the ecological costs when they become (paid) economic costs. It is well-known that estimating the full costs which have been internalised to date in order to avoid or repair damages to natural assets is not feasible. Even estimating the total costs internalised in the current period is not easy, despite the progress
made in accounting for environmental protection expenditures. However it would be very useful for environmental policy analysis and the information of the public at large to improve our knowledge in this field. There are two aspects to consider. One is to get better estimates of the internalisation process, when it happens, in current values. Another one is to find a satisfactory way of breaking up the change in nominal value of products impacted by the internalisation process into a volume (quantity and quality) change and a true price change. The estimate of the change in quality is potentially conflicting between the usual individual utility point of view and the social (collective) utility view which often gives rise to compulsory measures. Partial, unsatisfactory and probably incoherent decisions were taken in the past. Apparently, there was never a comprehensive study of this issue that needs to be revisited systematically. Beyond the central framework, satellite accounting looks more promising, in tackling the relative objectives and possibilities for physical accounting and monetary accounting respectively, as far as ecosystems are concerned.

Outside the field of accounting, research by environmental economists will continue to provide results, mostly valid in micro contexts, which are aimed at helping policy decisions in areas such as development projects which raise conflict between interested parties. However, these research results probably would not be fit for macro estimates in national accounting.

In order to help assess the sustainability of development, composite indexes of the change in total wealth, based on physical data weighted in various ways, will probably continue to expand their coverage and improve their quality. However, even when using monetary weights, it is unlikely that estimated prices will be available which reflect the scarcity of different kinds of assets, such as natural assets.

Full integration of sustainability assessments requires long term projection models and analysis. The distance between these theoretical models and their possible implementation is enormous, like in the Stern Review Report: The Economics of Climate Change (2006), and the integrated environmental - economic accounting approach referred to earlier.

Conclusion

After the great achievements of the last century, very broad expectations of national accounting have been developed in various circles. National accounts were supposed to adapt themselves in order to measure welfare and social progress; and to integrate economic and environmental accounting, everything being estimated in monetary value and put in the perspective of long term sustainability. In this context all sources of welfare have to be covered in an extended wealth approach, which the national accounting central framework is urged to adopt.

However, it is most improbable that the central framework of the SNA/ESA could in the future follow such an ambitious approach. Instead of staying in the present ambiguous situation where too much is expected, giving rise to ill-founded criticisms, it would be preferable to make a distinction between what national accountants can measure in the perspective of observation in terms of transaction equivalent values and what can be attempted by researchers and analysts through theoretical approaches.

The borderline is not always clear-cut between ‘observation’ on the one hand and ‘analysis’ on the other (in a paper written some years ago, I elaborated paragraphs written by Richard Stone in the 1968 SNA, paragraphs 1.96 and ss., where he made the distinction between an observation and an inference) (1). Nevertheless when measurements depend on theoretical assumptions that are at odds with important characteristics of the real-world economy, they are not good candidates for integration in the national accounts. Similarly (1). See André vanoli, ‘The New Architecture of the U.S. National Accounts and its Relationship to the SNA,’ The Review of Income and Wealth, December 2010, with a Reply by D. Jorgenson, S. Landefeld and W. Nordhaus]
estimated values, although expressed in monetary terms, that may not be considered transaction equivalent values cannot be integrated either.

My guess is that sometime in the future, as far as national accounting ‘observation’ is concerned, it will be agreed that a single fully integrated national accounting framework is not a relevant answer to the measurement, both in physical and/or value terms, of all stocks and flows that are covered by the concept of extended/ inclusive wealth (produced, natural, human, social).

In broad terms, four main frameworks can be distinguished from an information system point of view.

Such an agreement would probably imply some adaptation of the terminology. Particularly, the present SNA/ESA would preferably be called the System of National Economic Accounts and European System of Economic Accounts respectively (6); that is, the present national accounting would be explicitly called ‘national economic accounting’. As discussed earlier in this paper, it would integrate a convenient treatment of the extraction of marketed natural resources, an issue which is covered by the SEEA-CF 2012, and would develop mainly in order to introduce distributions and take account of globalisation. As a reminder, a number of satellite accounts are connected to the central framework of the SNA/ESA and can accommodate various topics.

Other accounting frameworks to be considered are ecosystem accounting (preferably called Nature’s accounting), still in a phase of experimentation (see for instance the SEEA-EEA 2012), and human capital stock estimates which have already a rather long background.

A fourth framework to complete the picture is not an accounting framework. It deals with the assessment of well-being/quality of life and may cover various approaches in line with the followings of the Stiglitz’s Commission recommendations and research work developed during the last decade. Presumably the measurement and analysis of so-called social capital should be considered in this context.

In the above picture, environmental accounting is transversal. It covers mainly Nature’s accounting, including the measurement of changes in the state of natural assets caused by economic activities. It also cover modules possibly included in other frameworks. For instance a module on environmental health damages can be part of (satellite) health accounts. Or inequalities as regards environmental amenities or nuisances have to be considered for the assessment of well-being/quality of life of various segments of the population. More generally various types of links have to be delineated between the diverse frameworks listed above. The potential importance of one of them was stressed in the second part of this article, when the estimation of unpaid ecological costs, the related Ecological debt and the possible valuation of final demand at total costs were suggested. In so doing national economic accounts and nature’s accounts would be significantly connected.

Even if an agreement of the type evocated in the previous paragraphs is reached, tensions between ‘observation’ and ‘analysis’ will not disappear. However the debate around national accounts could be dispassionate, accepting the idea that long term forecasting of sustainability and ex post accounting in the current period cannot be accommodated in exactly ‘the same pot’.

One implication of the above statement should be made very clear. It refers to the distinction between means (resources and other means) and well-being in the Stiglitz Commission’s report. Well-being is the result of the transformation of means by people. The implication is that by measuring means, one does not measure well-being by the same token. In contrast, in neo-classical economics, the measurement of means and the measurement of welfare are narrowly connected. This was actually the main conceptual basis for the welfare measurement debate around the GDP aggregate.

Whatever path is chosen, great integration around the concept of extended/inclusive wealth or a multiple frameworks approach, the extension of the concerns of society at the world level in the last

(*) The expression ‘Economic Accounts’ was sometimes used in the past. The first version of the ESA was called ‘Europeas System of Integrated Economic Accounts’.
three or four decades (sustainable development with intragenerational and intergenerational equity) has significant consequences for statistical systems.

Accounting systems have to be developed in fields like the state of natural assets that are much less familiar to statisticians. The circle of participants in these present debates is wide and diverse. It notably includes many experts of scientific disciplines on one side and a lot of environmental economists and specialists of long term modelling coming from the academic community on the other side. The decision processes are often influenced by interventions of the civil society, for instance through the action of non-government organisations, and expectations of the governing bodies of international or supranational institutions.

There are problems of governance of official statistical systems in relation with the emerging new fields of social concerns, in a context of tightened resources and when the requirements for economic statistics and accounts also increase for instance in relation with distributional considerations and globalisation.
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