



## Are National Accounts Moving Towards a Special Purpose System for Productivity Analysis?

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## **Are national accounts moving towards a special purpose system for productivity analysis?**

**By Bent Thage<sup>1</sup>**

### **Introduction**

In the comprehensive revisions of national accounts released by most countries since 2012, adjusting the accounts to the 2008 SNA / 2010 ESA the most significant changes relate to the capitalization of R&D and for some countries the direct output measures for the volume of individual government non-market services.

None of these changes relate to new phenomena, and could in principle have been introduced already with the *1968 SNA*, and were discussed prior to the *1993 SNA*. When these changes with more success were taken up again with the 2008 SNA and the 2010 ESA, it was largely as a response to the demand for a system that would be better suited for productivity analysis. This includes analyzing the effect on productivity of the increasing expenditures on intangible assets, and resolving the old “weakness” that the system did not allow productivity measurement for the government production of non-market services. But these changes were also driven by the idea that there exist an “ideal” system that it is possible to come still closer by eliminating obvious shortcomings in the existing system, also using the “it is only natural” argument.

With both these changes, national accounts have, however, moved into new territories that on their own represent comprehensive technical and socio-economic fields largely unknown to national accountants and characterized by continuous development, both concerning their delimitations, possible measurements, or even concerning the very existence of some of the items anticipated to be measured. The reports on the current projects on knowledge based capital (KBC) spearheaded by the OECD as well as the Atkinson report the and actual implementation of extended asset boundary and direct output measures illustrate the massive extent of these expansions relative to the traditional national accounts boundaries and required expertise.

This paper presents basically a number of observations, points of view and suggestions centered on the question whether national accounts are be moving towards a special purpose system for productivity analysis, and what the implications are, if this movement continues. And more generally the question of “W(h)ither the SNA?” is taken as an opportunity to mention a broader range of issues and concerns that are related both to the present state and future developments of the national accounts. From this follows

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that it is not the ambition of this paper to enter into a detailed argumentation for or against the various points brought up, or to try to cover the various subjects in an exhaustive way.

The paper starts with short discussion of the purpose of the national accounts, specialized systems versus multipurpose systems and the question of flexibility. In the two following sections the central question of a movement towards a specialized system for productivity analysis is discussed, first related to growth accounting and productivity and next related to direct volume output measures for government non-market services. The following section contains a mix of various observations related to the developments of the national accounts system, and the final section contains a brief history of the capitalization of R&D in the 2008 SNA and the 2010 ESA, also to serve as a caution against similar processes in future changes.

### **The purpose and the flexibility of national accounts**

In the early days of national accounts it was not obvious that there should exist only one general purpose system. In his “On National Accounting” (a book that is still unrivalled as an exposition of the basics of national accounting) Ingvar Ohlsson states: “The fundamental significant question regarding the role that the purpose plays in national accounting is rather the following: is the same NA-system applicable for all the various purposes for which it is currently used, or must alternative systems be drawn up to fit these different purposes”. At the time (prior to the first SNA in 1953) there was not yet any clear answer to this question, and also R. Ruggles raised this question: “A so-called general purpose accounting statement may well be a compromise among many purposes and therefore inadequate for any of them” (National income and income analysis, 1949, p. 40). Ohlsson also notes that Stones’ ambition seems to be to cover many purposes with one system, and when there are conflicts between purposes the “statement of result” (see below) apparently win the day (A Standardized system of national accounts, 1952)

Ohlsson makes a distinction between four important purposes: (1) Statement of results [Production and expenditure side aggregates, productivity and living standard] (2) Income behavior analysis 8 [Business cycle analysis, behavior, decision groups] (3) Structural analysis [Relations and shares across the economy, IO tables], and (4) National budgeting [Fiscal policy and over-all balances of the economy]. These systems would be different in relation to production boundary, imputations, concepts that would be comparable over time in spite of institutional changes etc. For purpose (2) he underlines that imputed transactions can also be justified in interpreting the actions of the subjects if the subjects themselves interpret these actions approximately in the same way, and in general he emphasizes that for none of these purposes do national accounts provide all the needed statistical information. He is not talking about self-contained analytical NA data-bases that many users of NA seem to require today.

Ohlsson notes that when the question of purpose has (at that time) played a subordinate role it may be either because it is assumed that an NA-system can serve all the different purposes of current interest or that the NA-system is designed only for one specific purpose. And he mentioned explicitly that the former point of view represents the “building block” idea where it is assumed that usable system for special purposes can be derived. The “building block” approach was again discussed during the work on the 1993 SNA as the “Dutch system” but was not accepted (Vanoli 2005 p. 165). The single system was seen as representing economic life in an economically significant way, making standardization and integration with other sets of standards as well as dialogue with users easy, and worked as a coordinating framework for economic statistics.

Thus, although both 1993 SNA and 2008 SNA indicate, by the elaboration of satellite accounts, that they do not intend to cover everything in a single integrated accounting system, there is basically only one central framework being discussed today, and the building block idea reduced to the existence of a number of satellite systems with one or more classifications in common with the single system. But the potential creators or compilers of satellite systems (environment, knowledge based capital, health, education) are usually not happy with this possibility, as they do not feel “recognized” until their system has been integrated in the core SNA, which in most cases will both diminishing the usefulness of the core SNA and limit the analytical flexibility that satellite system possess. When a satellite system (or potential satellite system) has been integrated in the core account, the building block property will be lost as users cannot with the existing data “unbuilt” this information again, such as for example “un-capitalize” R&D or “un-allocate” FISIM from the core system.

On the purpose of the SNA the *1993 SNA* (p. xliii).states that: “Two views have emerged on this question. One is that the national accounts are primarily an organizational scheme for economic statistics. The main value of the SNA, then, is in its consistent classifications and definitions and in its display of the interrelationships among the various parts of the economy. This view leads to an emphasis on the improvement of basic statistics, for the accounts will improve only as basic statistics allow. A contrasting view is that the national accounts serve primarily to facilitate analysis of the economy and decision making. The SNA, through its structure and definitions, not only determines the kind of analysis that can be carried out but also influences the way economic and social issues are considered. This view leads to a review of the uses of national accounting, and research in this topic has also been suggested”. Also that: “The upcoming fiftieth anniversary of international guidelines and standards for national accounts might provide the occasion for a review of the purposes and uses of the SNA along these lines”, which seemingly never took place.

Ways in which the *SNA 2008* may be adapted to meet differing circumstances and needs (1.73) are illustrated by how flexibility may be taken a stage further by developing satellite accounts that are closely linked to the main SNA but are not bound to employ exactly the same concepts or restricted to data expressed in monetary terms. Satellite accounts are intended for special purposes such as monitoring the community’s health or the state of environment. They may also be used to explore new

methodologies and to work out new accounting procedures that, when fully developed and accepted, may become absorbed into the main SNA in the course of time, in the way that input-output analysis, for example, has been integrated into the SNA.

But is it possible to imagine a future NA system that contains so many details and has so broad a coverage that reorganization of data can support any conceivable purpose? Not unless the national accounts are interpreted as embracing practically all economic and social statistics, organized according to common definitions and classifications, i.e. as a data base consistent with the new UNSD data strategy as expressed in *The Guidelines on Integrated Economic Statistics (UNSD, 2013)* that provide practical guidance on advancing consistency, coherence and reconciliation of statistical information through the application of the methodology of integrated economic statistics using the *SNA 2008* as the overarching conceptual framework. But this is not a very realistic scenario, as basically it would make the national accounts division superfluous, perhaps except for a special “imputation” division. On the other hand it would be reasonable to expect that countries with highly developed statistical systems would gradually need fewer resources for compiling national accounts.

Both the *1993 SNA* and the *2008 SNA* are opening up for some flexibility in the system, but the flexibility referred to is mainly to include more or less detail in social accounting matrices and supply and use tables. A different kind of flexibility that would also point forward to future expansions of the system would be to identify new phenomena in the system without changing its basic concepts. Thus the *1993 SNA* suggested that own-account R&D should be separately identified and valued and subsequently treated as intermediate consumption in the producing industry. This specification of R&D would not go beyond what can be defended statistically, and even the cost based valuation would be neutralized within the system. This would have been a flexible way of introducing the *R&D concept* for those interested, but was practically not done in any countries. It is therefore not correct to say that R&D was treated as intermediate consumption prior to capitalization. The R&D was not identified in the system at all, and as an ancillary activity it was not included in the intermediate consumption, it was as a concept simply outside the sphere of national accounts.

### **Growth accounting and multifactor productivity**

The compensation of employees has always been an integral part of the national accounts, and over time this has in many countries been supplemented with employment data by industry, measured as number of persons, in hours worked, and sometimes also subdivided according to skill or educational background. In any reasonably advanced statistical system these data have been readily available.

From the first day at university all economists have been familiar with the notion that output is produced by means of the two factors of production, labor and capital. It has therefore by many been

seen as spectacular data gap in the national accounts, that it included only output and labor, but not capital.

But even if no capital stocks were published, national accounts have always included the concept of consumption of fixed capital (CFC), the item linking gross and net concepts. But as CFC as defined in the national accounts could not be taken as depreciation in the financial statements of enterprises, and government most often do not record in its accounts any depreciation at all, deriving the national accounts estimates of CFC have over time caused considerable problems. Often very summary capital stock estimates are made to derive likewise summary CFC estimates, often only as a total not distributed by industry, except for the CFC needed for estimating government non-market services, which is often a rather free estimate. This the present situation in many countries.

This situation clearly indicates that estimating capital stocks and CFC is a task quite different from estimating the current variables of the national accounts system. The fact that by their very nature no current basic statistics or other observable data are available for these items implies that they can only be determined by model calculations based on a large number of assumptions, usually represented in the framework of the PIM method. The special status of CFC is also acknowledged by the SNA system making it possible to compile the whole set of accounts all the way down to net lending/borrowing without applying the CFC concept (except for its formal role in deriving Government and NPISH output and some market output for own use). The fact that CFC is not an observable transaction makes it belong to a different reliability class from other NA variables, and this is also the main reason why the GDP and not the NGP is the central aggregate of the system.

In recent years many countries have developed capital stock (and related CFC) estimates, primarily based on the PIM method. Even though it is a model calculation the data requirements are considerable. Time series of gross fixed capital formation, broken down by investment goods and industries are needed. The time series, and the related prices index series, most exist as far back in time as the longest lasting capital good. For each product/industry combination service life and efficiency decline over time must be decided. Clearly this represents a supplementary model-based estimation system that does not share characteristics with the central NA system.

In addition to giving CFC as a by-product the capital stocks estimates are now widely used for estimating capital services (CFC+return to capital) for use in growth accounting which ascribes an economy's growth to increases in the volume of the factors used – usually capital and labor – and the increase in the productivity of the factors, thus also including estimating as a residual the multifactor productivity (or total factor productivity). These calculations are based on a range of “neoclassical” assumptions such as the existence of competitive markets, maximizing behavior of producers, and production functions subject to constant return to scale. When the term *growth accounting* is used it indicates that no cause-effect relationships are being derived, and there is no way that you ex post can observe the return of the individual asset. This kind of accounting is fundamentally different from

standard national accounting, as it represents an economic model being itself based on data modelled in two rounds, first the capital stock and second the capital service.

The increasing interest in growth accounting and productivity measurement has been the main driver behind the extension of the asset boundary in the national accounts. With the capitalisation of R&D in the 2008 SNA and the prospects of capitalizing still more intellectual property products (IPP) (or KBC, Knowledge Based Capital) in the future, the model based growth accounting is no longer limited to being applied ex post with existing NA data as input, but the modelling exercise reaches into the existing core accounts, and significantly affects output and income concepts of certain industries and of the over-all system, both concerning their magnitude, reliability and general usefulness.

It is a characteristic not only of R&D but also of all the additional candidates for capitalizing in the national accounts that they mainly represent own-account output (the exception being some advertising costs) for which no market price exist, and which are in general not separately identified in the system. It is often stated that these costs are now classified as intermediate consumption (IC) and should just be reclassified as GFCF. But (as became clear when capitalizing R&D) these activities are now ancillary activities for which no data exist and therefore need to first be defined and hence to be valued from the cost side. Both these steps must be based on a range of assumptions as clearly demonstrated in the projects so far implemented with extended concepts of capital.

In recent years several projects (on which no listing will be attempted here) have focused on measuring intangible assets beyond the SNA boundary. These include employee skills, organizational know-how, databases, design, brands and various forms of intellectual property, and have been classified more formally under three broad categories, i.e. computerized information, innovative property and economic competencies, the so-called CHS classification (Corrado *et al.*, 2005) see *Table 1*. With the 2008 SNA all the assets types down to copyrights and license cost are already capitalized. According to the OECD project on Knowledge Based Capital (KBC) total KBC expenditures now exceed the classical physical fixed capital formation in many countries, and further these expenditures has been increasing much faster than GDP over recent decades. It is further noted that KBC expenditures other than R&D causes this accelerated growth.

In reports on the OECD project: New Sources of Growth. Knowledge based capital. 2011-14 it is repeatedly indicated that the non-R&D parts of KBC in table 1 should also be capitalized in the national accounts. In (Corrado et al. 2012) it is stated that it has been establish that modern business realities support extending the current asset boundary to include (more) intangibles in national accounts. This recommendation/expectation is reiterated in other writings on this subject. And the research agenda in the 2008 SNA includes broadening the fixed asset boundary to include other intellectual property assets such as practically all those covered by the CHS classification, and it is also mentioned that there are repeated requests to address the issue of human capital within the framework of the SNA. The road to even more capitalization in the accounts is therefore already laid out, and

**Table 1. The classification of Knowledge Based Capital (KBC) and their possible effects**

Type of KBC asset	Mechanisms of output growth for investor in the asset
<b>Computerised information</b>	
Software	Improved process efficiency, optimised vertical and horizontal integration
Databases	Better market segmentation and appropriation of consumers' rent. Optimised vertical and horizontal integration. The use of information to improve logistics and production efficiency.
<b>Innovative property</b>	
Research & Development	New products and services. Quality improvements to existing ones. Better ways of producing output. New technologies.
Copyright and license costs	Knowledge diffusion (inventions and innovative methods).
New product development in the financial industry	More accessible capital markets. Reduced information asymmetry and monitoring costs.
New architectural and engineering designs	Fixed cost leading to production in future periods. Quality improvements, novel designs, enhanced processes.
<b>Economic competencies</b>	
Brand-building advertisement	Price premium. Increased market share. Changes in consumers' preferences.
Market research	Targeted products and services. Increased market share.
Workers' training	Improved production capability of workers. Increased skill levels.
Management consulting	Faster and better decision making. Improved production processes.
Organisational capital	Faster and better decision making. Improved production processes.

Source: OECD Secretariat based on the classification in Corrado *et al.*, (2005).

objections about conceptual and practical difficulties of measuring these values will most likely be met with another handbook claiming to have resolved these problems once and for all.

Reports on the OECD KBC project also mentions that the implications for macroeconomic policy of capitalising spending on KBC in national accounts requires further investigation, and has barely figured in policy analysis to date. (OECD Synthesis, 2013) and that achieving consistent and high-quality estimates of investment for the many assets that compose KBC will require sustained effort over many years. Monitoring and co-ordinating the efforts of research groups and national statistical offices worldwide, in particular by facilitating knowledge sharing, enabling peer review and avoiding duplication, will accelerate this process. There are several key challenges, opportunities and areas of



progress. (OECD, *New Sources of Growth: Knowledge-Based Capital Key Analyses and Policy Conclusions*)

But what damage will a progressive capitalizing of more IPP do to the NA system? Here it is useful to start by looking at the reasons for excluding most of the services produced for own use by households (2008 SNA 6.28-31). The SNA admits that the excluded services contribute to economic welfare, but adds: “However, national accounts serve a variety of analytical and policy purposes and is not compiled simply, or even primarily, to produce indicators of welfare. The reasons for not imputing values for unpaid domestic or personal services produced and consumed within households may be summarized as follows:

- The own-account production of services within households is a self-contained activity with limited repercussions on the rest of the economy. The decision to produce a household service entails a simultaneous decision to consume that service.
- As the vast majority of household services are not produced for the market, there are typically no suitable market prices that can be used to value such services. It is therefore extremely difficult to estimate values not only for the outputs of the services but also for the associated incomes and expenditures that can be meaningfully added to the values of the monetary transactions on which most of the entries in the accounts are based.
- With the exception of the imputed rent of owner-occupied dwellings, the decision to produce services for own consumption is not influenced by and does not influence economic policy because the imputed values are not equivalent to monetary flows. Changes in the levels of household services produced do not affect the tax yield of the economy or the level of the exchange rate, to give two examples

Thus, the reluctance of national accountants to impute values for the outputs, incomes and expenditures associated with the production and consumption of services within households is explained by a combination of factors, namely the relative isolation and independence of these activities from markets, the extreme difficulty of making economically meaningful estimates of their values, and the adverse effects it would have on the usefulness of the accounts for policy purposes and the analysis of markets and market disequilibria”.

Identical objections can be raised against capitalization of activities that were previously, as ancillary activities/products outside the economic measurement boundary of the accounts. With the capitalization of such activities the additional output, income creation and use of income will take place simultaneously and reflect one single decision. The income never becomes “disposable”. Already with the capitalization of R&D this “non-disposable” income makes up 2-3 percent of GDP, but with a further capitalization of the CHS items this share will increase to around 10 percent of GDP, and this “non-disposable” increase will be with us all the way in the accounting system down to the capital account. The level of GDP will increase with around 10 percent, but the percentage increase will be much higher in some industries, and in the non-financial and financial corporation sectors. *Table 2*

illustrates these effects in a simplified example. It will be extremely difficult to attach any meaningful economic interpretation to these inflated flows, containing a high share of imputed income that the economic decision makers will not themselves recognize. Already with the capitalization of R&D the gross operating surplus in pharmaceutical and electronic industries have been increased very significantly, in the case of Denmark with 67 and 36 percent respectively, but in the companies' financial statements such income figures or R&D capital are not found.

The above distortions may in principle be at least somewhat remedied if value added were expressed in net terms rather than gross terms so that the CFC would be deducted from GVA. But even this would not solve the basic problem because in general the GVA is in fact “disposable”, as CFC is not representing an actual expenditure, but seen from the point of view of the decision maker more a kind of memo item. By shifting to net concepts at this stage the income that is actually “disposable” in the sense that creation of the income and its use is not taking place simultaneously, would be misrepresented. And such a change would affect the accounting structure and balancing items.

But even if it were decided to attach more weight to the net concepts perhaps from a strict production cost and profit point of view there would still be a trap as the changes (more capitalization, more gross) that have created the need for more prominence of the net concepts have at the same time contributed to increased uncertainty in the estimation of the CFC, as the capital and CFC estimates for intangible capital will be even less reliable than for tangible capital.

Finally, as the vast majority of KBC services are not produced for the market, there are typically no suitable market prices that can be used to value them. It is therefore extremely difficult to estimate values for the outputs of these services, and for lack of an alternative usually the sum of cost method will be applied. However, according the 2008 SNA, a cost based value of output for own use should include not only IC and compensation of employees, but also CFC and a net return to fixed capital. Here the CFC will also include some CFC related to the KBC which will be difficult to assess, but it could in the case of R&D output be significant. Further the return to fixed capital will also include return to the KBC involved in producing the KBC output. In the case where own-account output of KBC items is as much as 10 percent of GDP, and its valuation is made by the sum of cost convention, it is obvious that the over-all reliability of the accounts will be reduced.

However, according to Corrado, C et al. (2012) alternative approaches to using the sum of costs convention have also been attempted. A calculation of a price deflator for R&D implemented in terms of estimating its contribution to productivity applied to the UK gave a price deflator for R&D that *fell* at an average rate of 7-1/2 percent per year from 1995 to 2005—and thus implied that real R&D rose 12 percent annually over the same period. This is in contrast to the practice of using the GDP deflator (which *rose* 3-3/4 percent per year in the comparable period) to calculate real R&D. This clearly underlines the dependence of the R&D output and R&D capital of the assumptions made and the methods chosen.

Table 2. Illustration of the effects in the accounting system of extending the asset boundary

Before extending the asset boundary				After extending the asset boundary			
<b>Production account</b>				<b>Production account</b>			
Uses		Resources		Uses		Resources	
Intermediate consumption	50	Output	100	Intermediate consumption	50	Output	100
<i>Value added</i>	50			<i>Value added</i>	60	New KBC output	10
<b>Generation of income account</b>				<b>Generation of income account</b>			
Uses		Resources		Uses		Resources	
Compensation of employees	20	<i>Value added</i>	50	Compensation of employees	20	<i>Value added</i>	60
CFC	10			CFC	11		
<i>Operating surplus, net</i>	20			<i>Operating surplus, net</i>	29		
<b>Allocation of income account</b>				<b>Capital account</b>			
Uses		Resources		Uses		Resources	
Balance of primary income, gross	50	<i>Operating surplus, gross</i>	30	Balance of primary income, gross	60	<i>Operating surplus, gross</i>	40
		Compensation of employees	20			Compensation of employees	20
<b>Secondary distribution of income account</b>				<b>Secondary distribution of income account</b>			
Uses		Resources		Uses		Resources	
Income taxes	10			Income taxes	10		
Disposable income, gross	40	Balance of primary incomes, gross	50	Disposable income, gross	50	Balance of primary incomes, gross	60
<b>Use of income account</b>				<b>Generation of income account</b>			
Uses		Resources		Uses		Resources	
Household consumption	25			Household consumption	25		
Savings, gross	15	<i>Disposable income, gross</i>	40	Savings, gross	25	<i>Disposable income, gross</i>	50
<b>Capital account</b>				<b>Capital account</b>			
Uses		Resources		Uses		Resources	
Capital formation, gross. Traditional	15	<i>Saving, gross</i>	15	Capital formation, gross. Traditional	15	<i>Saving, gross</i>	25
				Capital formation, new KBC	10		
<i>Net lending/borrowing</i>	0			<i>Net lending/borrowing</i>	0		
Capital formation/GDP			0,30				0,42
Capital formation/disposable income			0,38				0,50
Imputed share of value added			0				0,17
Imputed share of disposable income			0				0,2
Imputed share of savings			0				0,4
Saving/disposable income			0,38				0,5

In 2008 SNA (20.1) it is argued that there is evidence that calculating capital services leads to improved measures of the capital stock, and therefore it is proposed to prepare a supplementary table to display the implicit capital services provided by non-financial assets. But unless we would be ready to change the GOS from such a check, this would be to put the wagon before the horses, and derive an alternative estimate of the capital stock based on the estimated GOS, and this would further lead to dealing with the market value and goodwill of companies, also outside a situation of actual sale.

The suggestion to include capital services into the system is seen as a part of a greater package, also including growth accounting and productivity analysis. The increase in the interest of this kind of analysis may, however, not justify expanding the system of national accounts to include such calculations which are fundamentally different from official statistics. The long list of assumptions that necessary must be made to obtain these results make this exercise belong outside the national accounts alongside the many other kinds of analysis that are using national accounts data as their primary input. As the resulting multi factor productivities are critical dependent on the assumptions made and the assets included in the capital stock, these results should not be seen as belonging to the official national accounts statistics. It is also doubtful how these results, somewhere between accounting and economic analysis, should be interpreted by users as basis for “informed decisions”. Should policy makers be concerned or not when they see that MFP is going down? The (apparent) labor productivities may still represent a more robust short term signal about the general productivity situation.

### **Direct output measures of government non-market services**

Both the 2008 SNA and the ESA 2010 recommend using the “output method” for calculating the volume of individual government non-market services, in particular health and education. Formally such measures of output should fully reflect changes in both quantity and quality. It is, however, important to be aware that this is not an improvement relative to the “input method”, but a completely new measurement paradigm that has not previously been part of national accounts methodology.

The 2008 SNA also recommends that the applied volume indicators be tested for a substantial period of time with the aid of experts in the domain prior to their incorporation in the national accounts, and further that the implications for *productivity measures* should be fully assessed before adoption, and states that until the results of such investigations are satisfactory it might be advisable to use the second best method, the “input method”

With the ESA 2010 the use of the “output volume method” is made compulsory for EU Member States. It is argued that in the absence of a unit market price, the unit cost of a non-market service can be considered as the equivalent to the price. In fact, the price of a market product corresponds to the expenditure which the purchaser must incur in order to take possession of it, while the unit cost of a non-market service corresponds to the expenditure which *society* must incur in order to make use of it.

Thus, where it is possible to define units of quantity for non-market services, it is also possible to apply the general principles for calculating volume and price indices. (10.29), and the output method consists of calculating volume by applying unit costs of the previous year to the quantities of the current year.

In the European Union it has, given the conceptual difficulties and the absence of consensus on output methods adjusted for *quality* (based on outcome), been decided that quality adjustments are excluded from the central framework in order to preserve the comparability across countries of the results. Thus, in the field of non-market health and education, the estimates of production and of consumption in volume terms have to be calculated on the basis of direct output measures — not adjusted for quality — by weighing up the quantities produced by the previous year unit costs of those services, without applying any correction to them in order to take account of quality.

The introduction of the output method as “recommended” in the 2008 SNA, and as compulsory, though in a truncated form, in the 2010 ESA, excluding taking into account any changes in quality, no doubt indicates a movement towards applying the output method more widely. Even though major countries such as USA and Canada have so far, on the basis of comprehensive experimental estimates, decided not to introduce the output method in the near future, there is also in this area a pressure to present national accounts data that make productivity calculations possible. In the handbook: *Towards Measuring the Volume Output of Education and Health Services* (OECD, 2010), it is already in the opening remarks stated that in the past, such services have typically been measured by the inputs used to provide them but such an approach neglects any productivity changes in service provision, but the handbook also points to the fact that further work is needed.

Already prior to the adoption of the 2010 ESA the EU member states were since 2006 required to report the volume of individual government non-market services based on the output method. It was the very divergent movements of these results across countries, much of which could be related to implicit or explicit quality adjustments that is the reason for the ESA 2010 decision to exclude quality adjustments, although this is at odds with basic principles governing volume estimates in national accounts. Being aware of this Eurostat has taken steps to have countries agree on the principles for quality adjustments, but this may be a long (and perhaps impossible) endeavour, and it is remarkable that priority was given to introducing an amputated output method rather than awaiting more conceptual and practical clarification (the conclusion of which could have been that it is not feasible to make this change). To release half-cooked data also indicates a disregard for the users, and raises the question how much experimental/incomplete data the published national accounts can include and still retain its reputation as official statistics.

The Atkinson Review: *Measurement of Government Output and Productivity for the National Accounts* (2005) is the most comprehensive and influential work on this subject. He underlines that the introduction of the output method requires significant investment in resources, both in the statistical offices and in the government departments where administrative data systems may need to be extended

and adjusted and that direct measures of output need to be continuously monitored to ensure that they are capturing changes in quality. He also underlines that even when based on source data of very good quality, the results should not directly be used for productivity estimates, but independent corroborative evidence should be sought on government productivity, as part of a process of ‘triangulation’, recognising the limitations in reducing productivity to a single number. He also notes that in view of the high profile of these statistics in the political debate a careful course must be steered to guarantee the independence of this approach.

One dominant the problem with the direct output estimates implemented so far seems to be that the necessary resources, both in terms of staff and required and source data, have not been made available. Therefore the results have limited validity and may also show funny movements over time. The other side of the coin may be compilers keeping an eye of the implicit (apparent) labour productivity and adjusting results to keep labour productivity within “reasonable” bounds. When considering: (1) the data requirements, (2) the human resources needed, (3) the multi dimensionality of this exercise, (4) that we are dealing with measures that were previously outside the national accounts boundary and combined with (5) the fact that this it obviously still work-in-progress, the direct output volume measures seem to be a clear candidate for a satellite system.

In a broader perspective the direct volume output measurement can also send troublesome political signals. When national accounts creates a market interpretation of the government non-market activities the expectation will be that measured productivity increases in these activities will be of the same order of magnitude as those in the market economy, and that it is a signal of “inefficiency” in government services if this is not the case.

However, if we look at the government as a collective consumer of resources, rather than a producer, in parallel to private households, it is not obvious that we should expect increasing productivity. With increasing living standard *households* consume more resources and may even work less. This “standard improvements” (decrease in household productivity) will over time spill over into many government non-market services, where standards are improving as society becomes better off – better hospital and school facilities, more staff per patient or per student etc. To match this increase in resources with a similar or higher increase in output will often require a very lively fantasy for inventing quality increases.

But if the “true” underlying measure of productivity is declining in the medium and long run this will place both the compiler of the accounts and the government as user in a difficult situation, as such results will be fuelling the political debate, which often is about efficiency and quality of government services. Declining productivity will be a problem directly on the table of the government, and good news for the political opposition in a way quite different from a measured decline of productivity for a market activity, where no direct political action will be expected, and the decisions makers may not care much or even get to know about it. Another risk is that simple volume output estimates may just

be introducing “new public management” instruments into the national accounts, showing that cuts made in government budgets (for example also for statistical offices) are precisely matched by productivity increases (which may be deemed to be 2 percent annually).

### **Points of view, observations, suggestions**

- Much national accounts discussion has moved so far away from the observable real world that it has become almost deplorable to point out that some of the phenomena supposed to be measured may not exist at all (for example government non-market output, some intangible capital stocks). But how far is it the purpose of national accounts to “perfect” the world so that activities that do not take place in a market economy under perfect competition have to be put right to fit into a market philosophy, based not only on technical assumptions about the individual issue but rooted in specific economic interpretations of the world, ranging from neoclassical optimization theory to neoliberal market ideology.
- There is a “lack of market prices” is a statement often made when discussing for example government non-market services or products that are produced for own consumption by market producers. From a statistical point of view this statement makes no sense. The fact is that there are no prices to be observed, and under what conditions is it necessary to pretend to observe phenomena that obviously do not exist, and are seemingly not needed by the decision makers in those particular areas.
- When it comes to the measurement of the more abstract and less tangible items already now included in the accounts or suggested for future expansions a fabulous optimism is often expressed, along the lines that “much remain to be done” or even that “sustained efforts are needed”, but not for one moment doubting that a solution will eventually be found. However, such solutions will often just consist of another set of “internationally agreed” assumptions. Those familiar with economic model builders will know that whenever they miss some data they are overnight able to come up with an estimate to feed into the model. There might be a risk that this way of looking at measurement spills over into the field of national accounting. It is essential that a fairly clear borderline can be drawn between statistics and economic modelling. (On this Dr. Alfred Franz during the preparation of the 1993 SNA noted that there is a risk that the meaning of SNA will be changed to a System of National Assumptions). On sophisticated ways of measuring phenomena that may not really exist there is for those interested a rich example in the medieval science of Angelology.
- In the OECD *Handbook on Deriving Capital Measures of Intellectual Property Products* it is argued that capitalization of R&D is a *natural* extension to the 1993 SNA, which already prescribes recording acquisitions of software and databases, mineral exploration, and entertainment, artistic and literary originals as capital formation. But to justify new expansions of the asset boundary by reference to previous expansions is a sophistic way of reasoning which

in the next step will lead to the capitalization of other types of knowledge, and eventually introducing human capital in the accounts, as these *naturally* follow from previous decisions. The practical problems will be solved by another handbook. Whenever changes to the system are justified by being *natural* or *modern* all alarm clocks should start buzzing. The same is the case if suggested changes require detailed guidelines and voluminous handbooks to obtain “comparability” across countries.

- On the continued expansion of the scope of national accounts beyond what any data can support Leontief’s observation from 1971 is still valid: “The weak and all too slowly growing empirical foundation clearly cannot support the proliferating superstructure of pure, or should I say speculative economic theory”. Though he spoke at that time primarily about the relationship between limited data availability and theoretical model building, the situation today has escalated by the speculative economic theory invading the field of data production. On this subject also William D. Nordhaus “Measurement without data” (1973) could be consulted.
- But what are the differences between the theoretical data production that has invaded the national accounts and the advanced methodologies that are today used in statistical offices when editing and completing (grossing up, classifying etc.) data. The main difference is that the phenomena under consideration do unquestionably exist and are by the applied methods being measured on their own specific conditions.
- When compiling (traditional) national accounts there are - in spite of the still increasing availability of economic and social statistics - still many cases where source data are incomplete or missing. Publishing a partial GDP (leaving out certain economic activities because source data are missing) is not an option when compiling national accounts. It has therefore always been the privilege and duty of the compilers to decide on certain parts of the economic reality on which no objective knowledge exist. The main problem has not been to have such data verified, but to make sure that nobody has any basis for rejecting them. Later on, if statistics are forthcoming, the estimates may of course turn out to have been completely wrong.
- The fact that compilers of NA in this way necessarily must be in the business of making subjective and unverifiable estimates, may have blurred the situation vis-à-vis the situation where data are based on the application of economic theory and/or political conceptions of how the economy works or should work, and lead to a situation where a certain stage of fatalism has taken hold, so that a distinction between the two situations is not made, “because as the existing estimates are already unreliable it does not matter that some (additional) speculative data are being introduced into the accounts”.
- But constructing data for non-observable items based on assumptions, such as for R&D output and capital and for direct output measures of government non-market output (and of course capital services and total factor productivity) and making this the breaking news of national accounting sends a very unfortunate signal to ordinary compilers, somehow legitimizing loose definitions and sloppy work practices. When assumptions and hypothesis are rolled into official numbers, genuine measurement may be downgraded. To the extent that guidelines and



handbooks are mainly solving conceptual and practical problems by suggesting a set of standardized assumptions to make estimates comparable across countries, they also become a means of excusing the compilers from their responsibilities as statisticians, as they can now claim to be following “international recommendations” irrespective of the quality of their estimates. Recommendations consisting of sets of assumptions with a weak or no empirical basis, or of purely theoretical nature, do not suddenly become statistically acceptable just because they are being used identically in many countries.

- Some guidelines and handbooks have already at the planning stage played an important role in having these extensions of SNA accepted and finally approved, as concerns about conceptual and practical problems were met with arguments such as “guidelines, together with handbooks on methodology and practice, will provide a useful way of working towards solutions that give the appropriate level of confidence in the resulting measures” (2008 SNA 10.104). The correct sequence would have been to have these publications made available prior to suggesting such changes to the SNA.
- The above points towards the need to establish a clear borderline between on the one hand (official) statistics, and on the other hand economic modelling and economic theory when discussing the future of national accounts. During the process prior to the approval of the 1993 SNA the “green” lobby made a very powerful attempt to have the core national accounts include environmental concerns, but were finally defeated on the argument that national accounts would lose its general applicability. Instead work started on the first SEEA, and has later been continued very successfully resulting in the SEEA 2012 with the status as international statistical standard. During the discussions on the updating of the 1993 SNA (and from the very start) the “productivity” lobby was more successful in gaining influence on the core national accounts, in particular by extending the assets boundary, and having the concept of capital services recognized as an integral part of the 2008 SNA, though calculations of the latter is still not perceived as a standard national accounts table. (SNA 20.1 suggests a supplementary table).
- Several of the recent extensions of national accounts represent analytical uses of the previously existing NA data being built into the system. In addition to the fact that these changes do not represent official statistics, they also require analytical capabilities that will in many countries not be found in national accounts divisions. It is problematic if policy decisions are being based on analytical results disguised as statistics. In most statistical offices there is an urgent need to concentrate analytical work on the already existing estimates rather than diverting into new fields of work. Model builders are traditionally allowed to create their own data, often by very basic methods, and still have their results considered a professional product. Official statistics are not (or should not be) in the same position.
- For the *productivity purpose* of national accounts a solution similar to the one previously found for the *environment purpose* would serve both the national accounts and the productivity calculations better. Aiming at a satellite system that could progressively include all dimensions

of the productivity issue may well be comparable to the SEEA in its broad coverage and flexibility. Right now the road seems to be laid out to further extensions of the asset boundary in the core national accounts. This will weaken the general applicability of the accounts and at the same time increase the share of data derived from assumptions only, thus undermine the usefulness of the GDP concept.

- For the proponents of both the environmental and the productivity issues the interest in having their concerns integrated in the core national accounts seems related both to the “trade mark” value of the national accounts (the belief that an issue is only recognized by the society at large when it can be identified in the national accounts), and to more practical aspects: when certain data are formally included in the standard national accounts tables, resources must necessarily be allocated for their compilation, and at the same time the responsibility for data quality (or lack of same) is conveniently transferred from model builders to national accounts compilers.
- However, as both the present stage of the SEEA, and the many projects including productivity studies testifies, these fields of analysis thrives well without all their data needs being integrated in the core national accounts. It is in particular noted that the flexibility and variation in coverage and methodology seen in these projects would not be well served with national accounts type of data for which definitions and compilation procedures have been inflexibly established, and may be changed only in connection with major revisions every 5 or 10 years. Already now productivity projects points to problems in the way R&D output and capital has been derived in the just released 2008 SNA data, and it is very unlikely that extended capitalization of IPP in the national accounts could be based on definitions and calculation methods that would be of interest for analytical users in the longer run.
- Therefore data sets that have the potential to develop into their own satellite systems should not be built into the core national accounts. Firstly because they will undermine the general applicability of the accounts, and secondly because inflexible national accounts data will not serve the particular analytical purpose well. Fields of analysis that are continually developing, both concerning methodology and data requirements, should not be candidates for having their data needs built in to the core accounts. The core national accounts should have a general validity, both as general purpose data base for analytical uses, and in describing the economy over longer spans of time. It should be invariant vis-a-vis the fashion of the day, and rather than discussing production and asset boundaries, determining a long-term “SNA boundary” should be an objective.
- It is remarkable that the extensions of the SNA are taking place in those areas where they are in particular difficult to handle because of the increasing globalization. This would have been understandable if the extensions represented new issued that had come into existence because of globalization, but that is not the case. There is so far only very limited statistical information about the flow of knowledge across borders, and these may be heavily influenced by transfer pricing of KBC-related transactions, and by the very nature of knowledge it is very unlikely that

it will ever be possible to get the statistical coverage that already the present capitalization of IPP requires, as also outlined in *The Impact of Globalization on National Accounts* (UN, 2011)

- Resources in statistical offices are not increasing in these years in spite of still growing requirements in many fields of statistics. Even though some efficiency gains may come from more automation and increased reliance on administrative data sources the organizations are put under pressure, and this is also true for the resources available for compiling national accounts. The implementation of the 2008 SNA has required a concentrated effort and the expansion compared to 1993 SNA will on a current basis be more resource demanding, leaving little time for engaging in the more analytical aspects of national accounting, or to take active part in discussions about where national accounts should go in the future.
- For most of the national accounts divisions worldwide it is probably true that the often very limited staff have never read more than a few selected parts of the 1993 SNA (and even less of the 2008 SNA) and that all the numerous guidelines and handbooks only add hundreds of more pages to the unread pile of books. If the ambition still is to have a worldwide system where at least the GDP means approximately the same in all countries it does not make much sense to plan further enlargements of the national accounts system. It would also be useful to think in cost-benefit terms, not only for developing countries, but also for developed countries. It could be interesting to get an estimate of the worldwide cost of implementing the 2008 SNA.
- When resources are diverted into implementing (and trying to understand) new system, compile back series etc. they are moved away from the current work on the traditional accounts where they are in general most needed. Thus the marginal utility of improving estimates for say construction or trade in most third world countries would far exceed that of trying to estimate such items as for example the growth of crops, historic monuments, artistic originals or research and development, but it is on the latter items that countries are assessed as complying with international standards or not.
- Concerning the “boundary” of the national accounts there is no theoretical correct decisions as to what should be included or not and what should be the boundaries between the different categories identified. We are not in a steady though slow progression towards the ideal system of national accounts, so that after a few more updates of the SNA we will be there. When looking at the matrix representation of the complete system, starting with the famous table 2.1 in the 1968 SNA, now reduced to a very summary table (28.11) in the 2008 SNA, it is tempting to assert that the full system would include filling in all cells where data can logically appear, such as when we have fixed capital formation we must also have stocks of fixed capital etc. In *Quantifying the World* (2004) Michael Ward insists that data should not only fit into a system, but also be potentially useful, and consider to which question national accounts are the answer.

### **A brief history of capitalization of R&D in the 2008 SNA and the 2010 ESA.**

From the outset the updating of the 1993 SNA was supposed to result in a 1993SNA, Rev. 1, and the updating to include only such new phenomenon that had become important since the adoption of the 1993 SNA. In accordance with the mandate from the Statistical Commission the revision should not include fundamental changes to the system. Nonetheless two of the original 44 issues for change were related to the capitalization of R&D and military weapon systems. None of these represented new phenomenon and both had already been discussed intensively in connection with the preparation of the 1993 SNA, and rejected. From the beginning the inclusion of these two issues were met with considerable opposition, both because they were seen as beyond the mandate for the revision, as they represented fundamental changes, and because, especially for R&D, there would be serious implementation problems, as major conceptual questions and incomplete or missing source data would undermine the quality and relevance of the accounts. The capitalization of military weapon systems will not be further discussed in this paper as this has already been done in an excellent way by André Vanoli, latest in Eurla (2014).

During the whole SNA updating process (2003-2009) the question of the capitalization of R&D continued to be subject of controversy, that also spilled over into the parallel/subsequent updating of the ESA (2006-2014), where the challenge of having the SNA capitalizing R&D, but the ESA rejecting it, thus undermining the idea of a single world-wide system of national accounts, was faced. It is not possible within the limits of this paper to go in detail with all the steps in this long process, but an outline will be given, as the process is of interest not only related to the specific R&D issue, but also serve as an illustration of the way changes to the SNA ,and even fundamental ones, are eventually determined.

The results of this long process were reflected in the text of the 2008 SNA and the ESA 2010 in the following way:

#### **2008 SNA**

10.104 R&D should be recognized as part of capital formation. In order to achieve this, several issues have to be addressed. These include deriving measures of research and development, price indices and service lives. Specific guidelines, together with handbooks on methodology and practice, will provide a useful way of working towards solutions that give the appropriate level of confidence in the resulting measures.

#### **ESA 2010**

1.51 (a) the recognition of research and development as capital formation leading to assets of intellectual property. This change shall be recorded in a satellite account, and included in the core accounts when sufficient robustness and harmonisation of measures is observable amongst Member States;

3.22 Products used for own capital formation can be produced by any sector. Examples of such products are:

(e) own-account research and development. Expenditure on research and development is only to be recorded as fixed capital formation when a sufficiently high level of reliability and comparability of the estimates across the Member States has been achieved.

3.127 The following types of gross fixed capital formation are distinguished:

(7) R&D, including the production of freely available R&D. Expenditure on R&D will only be treated as fixed capital formation when a high level of reliability and comparability of the estimates by the Member States has been achieved; And further in the chapter on satellite accounts:

22.108 In the central framework, research and development expenditure is treated as intermediate consumption, i.e. as current expenditure benefiting production for the current period only. This runs counter to the nature of R&D, the aim of which is to improve production for future periods. In order to resolve the conceptual and practical issues of recording R&D as capital formation, R&D satellite tables recognising R&D as capital formation will be drawn up by Member States. This will enable Member States to develop robust and comparable methods and estimates. In a second stage, when a sufficiently high level of reliability and comparability has been achieved, R&D will be capitalised in the core accounts of the Member States.

In the *2008 SNA* this long discussion is reflected in only one single paragraph, and here only in very vague wording, so that readers would not know the reason for or the meaning of this paragraph if they have no prior knowledge of the background. Furthermore this paragraph was only inserted during the prolonged revision period on the request of several countries. In the original draft of chapter 10 presented to the 2008 UNSC there was no mentioning whatsoever about any problems related to capitalization of R&D. On the contrary the *ESA 2010* takes very explicitly the position that R&D should only be capitalized when conceptual and practical issues have been resolved a sufficiently high level of reliability, robustness and comparability of the estimates across the Member States has been achieved. This statement is repeated in all relevant connections throughout the *ESA 2010*. In the meantime (which in principle could last for ever) a compulsory system of satellite accounts for R&D, also included in the *ESA2010*, should be implemented.

Prior to the final decision on capitalizing R&D in the *2008 SNA* (at that time still named *1993 SNA, Rev. 1*) the report of the ISWGNA to *UNSC 2007* concluded from the international discussion on R&D in the following way (p.10-11):

The Intersecretariat Working Group puts forward the following wording designed to adopt the principle of treating research and development expenditure as fixed capital formation and to encourage focused work to implement the principle in a sound and internationally comparable way:

In principle, research and development expenditure should be recognized as part of capital formation. However, there are a number of difficulties to be overcome before the objective can be reached. Satellite accounts will provide a useful way of working towards solutions that give the appropriate level of confidence in the resulting measures and practical guidance on implementation will help to ensure international comparability. Therefore, the *1993 SNA, Rev. 1* will describe the objective and its conceptual underpinnings, note the difficulties and provide links to work underway to overcome them and recognize that for many countries implementation will take some time. The Intersecretariat Working Group will report periodically to the Statistical

Commission on progress and signal when widely accepted implementation guidelines are available.

It is noted that the existence of conceptual problems is not mentioned at all, although this was at the core of many of the country objections made. It is all reduced to practical problems which guidelines on implementation will solve. But even this was much played down in the report from the UNSC 2007 (p.9): “Emphasized the need .....to undertake additional research on the estimation of research and development as capital formation”. And in the ISWG report to the 2008 UNSC the text on R&D deals exclusively with initiatives related to guidelines and handbooks. There is no mentioning of conceptual problems and seemingly no practical problems that will not be resolved by these not yet drafted guidelines and handbooks.

In the case of ESA the sequence of events was different. Following the discussions at The OECD Committee on Statistics meeting in June 2006 where serious doubt of the about the suggested R&D capitalization was first discussed at the chief statisticians’ level, the Eurostat Statistical Programming Committee at its meeting in November 2006 approved the following:

There is a conceptual agreement that R&D expenditure has the inherent characteristics of investment, and in that sense it is agreed that in principle it should be the long-term objective to include this expenditure as capital formation in the core national accounts. It is also agreed that there are substantial conceptual and measurement difficulties to be solved before this long term objective can be achieved. There is an agreement that compulsory satellite accounts should be developed in the short- to medium term in order to address these difficulties and to create the necessary basis to achieve this long term objective. The final decision to include R&D expenditure as capital formation in the core national accounts should be taken when sufficient evidence is gained through experience in satellite accounts showing that it can be measured with appropriate confidence

This decision was the basis for drafting the text on R&D in the ESA 2010, approved as Regulation No 549/2013 in May 2013. However, along with the carefully worded text on R&D in the ESA 2010, the preamble to the regulation had the following paragraphs:

(18) Research and development expenditure constitutes investment and should therefore be recorded as gross fixed capital formation. However, it is necessary to specify, by means of a delegated act, the format of the research and development expenditure data to be recorded as gross fixed capital formation when a sufficient level of confidence in the reliability and comparability of the data is reached through a test exercise based on the development of supplementary tables.

(26) The Commission will carry out an evaluation as to whether the data on Research and Development have reached a sufficient level of quality both in current prices and in volume terms for national accounts purposes before the end of May 2013, in close cooperation with the Member States, with a view to ensuring the reliability and comparability of the ESA Research and Development data.

And the Regulation itself this article:

5. Research and development expenditure shall be recorded, by Member States, as gross fixed capital formation. The Commission shall be empowered to adopt delegated acts in accordance with Article 7 to ensure the reliability and comparability of the ESA 2010 data of the Member States on research and development. In exercising its power pursuant to this paragraph, the Commission shall ensure that such delegated acts do not impose a significant additional administrative burden on the Member States or on the respondent units

However, in the case of ESA2010, which was passed as a EU Regulation as late as May 2013, a number of steps were taken that effectively undermined the ESA text, reducing the envisaged satellite accounts to a “test exercise” and aiming at introducing the capitalization of R&D right from the first transmission of ESA 2010 data in September 2014. This becomes clear from the sections (18) and (26) in the preamble of the ESA2010 Regulation, and in par. 5 of the Regulation itself (quoted above), which effectively stipulates that the Commission can at any time decide that the conditions for the capitalization of R&D in the core accounts are fulfilled. In these paragraphs there is no mentioning of conceptual problems.

Two Eurostat Task Forces (TF) were successively created. The first TF worked during 2008-09 and the second TF 2011-12. Basically they were involved in having the member countries filling out “supplementary tables” on R&D and promote exchange of experiences on this work. According to the preamble (26) the Commission would before the end of May 2013 (surprisingly a date that coincided with the adoption of the ESA2010 regulation itself) decide whether the reliability and comparability of the ESA R&D data were sufficient for capitalization of the R&D in the core account.

A big majority of the second TF and the subsequent meeting of *Directors of Macroeconomic Statistics* (DMES) and the National Accounts Working Party saw no major obstacles against implementing the capitalisation of R&D in national accounts (November 2012), and the legal process to fully implement in the ESA 2010 the principle of capitalization of R&D, now claiming that the data on R&D had reached a sufficient level of quality both in current prices and in volume terms to be capitalized in the core account. Because of legal formalities the Delegated Act was only finally forwarded to the Council in *December 2014*, so that only at this time was it formally decided to implement the capitalization of R&D in the core ESA2010, i.e. several months after the member countries had submitted their ESA2010 data *including* capitalized R&D.

Thus the foreseen transition period where R&D capitalization was supposed to be treated in a satellite system was over almost before it had started, not only for EU Member States but also for other countries which confronted with the fact that capitalization of R&D was now implemented not only by EU Member States but also by other major industrial countries could hardly refer to conceptual or practical problems, as these had seemingly already and in an surprisingly short time been solved to everybody’s satisfaction.

Now, already the Canberra II Group on the Measurement of Non-financial Assets (2003-2007) that was created to investigate issues pertaining to non-financial assets as part of the update of the 1993 SNA had concluded that it was both conceptually desirable to capitalize R&D and feasible so in a comparable way across countries. As a continuation of this work a formal OECD task force developed the *Handbook on Deriving Capital Measures of Intellectual Property Products* that included practical guidance on the measurement of R&D and other IPPs. It was published in 2010, but even at that time the expectation was that capitalization of R&D in the core national accounts was not just around the

corner, and in the foreword it was noted that: “At the time of writing all EU countries and most OECD countries have begun, or will soon begin, to develop R&D satellite accounts. The intention of most of these countries is to develop and evaluate them over a number of years before deciding whether to introduce the data into their core accounts”.

The OECD Handbook was available for the work of the second Eurostat Task Force (2011-12) and, in addition to some experimental tables worked out in the EU Member States, made up much of the background for their recommendation to capitalize R&D in the core account right away. The outcomes of the second Eurostat Task Force formed the basis of the Eurostat *Manual on measuring Research and Development in ESA 2010*, that was available in a draft version in 2013 and a final version in 2014.

However, the common characteristics of all these work groups and Handbooks and Manual are that they have not solved any of the conceptual and practical problems related to the capitalization of R&D. Their main virtues have been to identify the problems, both conceptual and practical, and then in each case to suggest assumptions to circumvent the problem. As noted in the Eurostat Manual: “Intellectual Property Products are not simply a variant on the more usual tangible assets represented in economic theory and the national accounts. IPPs are different in their very nature, and pose different conceptual, methodological and measurement challenges for economists and producers of national accounts”. The guidelines represent mainly lists of unverifiable assumptions, and the problems are largely still unresolved, which is also confirmed by available documentations of implementing capitalization of R&D, such as for example *Changes to National Accounts: Measuring and Capitalizing Research and Development*. Office of National Statistics. (June 2014) and *Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts*, BEA (March 2013).

The process in which the capitalization of R&D was almost overnight implemented in the core national accounts in spite of clear indications during the whole updating process that this would have to await clarification of important issues, should serve as a caution against similar processes in future changes to the SNA. The process has been characterized by a very firm decision by powerful players right from the beginning to have this capitalization implemented, and not let it be stopped by any counter arguments or unresolved conceptual or practical problems. Maybe the creation of the Canberra Group II was a mistake, as there is always a risk that highly specialized groups will be composed of those who have strong preference for a certain development. Also the OECD had, as the guardian of the R&D statistics and productivity analysis, a vested interest in promoting this area. And perhaps the ISWGNA should have intervened when suddenly it became clear that R&D was about to be capitalized largely without any conceptual and practical problems having been resolved. But it had by its previous actions excluded itself from this possibility.



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