

# The SNA : some outstanding issues

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*This paper focuses on three broad issues. The first is the scope of the SNA and its accounting structure. The presentation of the SNA accounts can be improved to bring out the inter-dependences between real and financial activities in the economy. This issue has become more important as a result of the current turmoil in financial markets and re-emergence of the business cycle. Another issue is the potential conflict of interest between analysts concerned with economic stabilisation and those concerned with long term growth. The final issue is the need to reconstruct the production account, the fundamental account of the system, in such a way that the inputs provided by fixed assets into processes of production are measured and valued correctly.*

## Introduction

1. The SNA is a system of macro-economic accounts based on an internationally agreed set of concepts, definitions and classifications. It is designed to provide information about the state of the economy that can be used for purposes of monitoring economic activity, economic analysis and forecasting and policy making.
2. One question that needs to be kept under continual review is whether the accounts cover the right kinds of economic activities and enough of them. Two activities of prime importance are production and consumption. Production functions and consumption functions play a central role in economic theory at both a micro and macro level. As Adam Smith observed, consumption is the ultimate goal of economic activity, but consumption is obviously constrained by the capacity to produce. A third type of economic activity is the accumulation of capital, although this is not a physical process of the same kind as production and consumption.
3. Activities are recorded in economic accounts by means of the flows of the real goods and services that are associated with the activities. When the goods and services are bought and sold on markets, monetary transactions take place and the values of the purchases and sales can be observed and recorded in accounts. On the other hand if they are not bought or sold there are obviously no monetary transactions to observe and record.
4. Production for own consumption or own capital formation is an important type of economic activity. It occurs within enterprises as well as households. When production for own use takes place an internal transaction can be deemed to take place in which an economic unit in its capacity as producer provides a good or service to itself in its capacity as consumer or user. The quantities of the goods and services involved in internal transactions are real, observable and measurable. However, there are no prices to go with the quantities. If the internal transactions are to be recorded

in economic accounts, prices have to be associated with the quantities. If they are available the market prices of the goods and services can be used for this purpose.

5. When quantities are valued in this way it is common to say that the prices are imputed. However, neither the transactions nor the quantities are imputed. From the early days of national accounting, the extent to which internal transactions should be included in the accounts has been a recurring and controversial issue. Internal transactions are sometimes interpreted as if they were theoretical or even hypothetical constructs but the plain fact is that if they are ignored and not recorded, real economic activities and their associated real costs and benefits go unrecorded. It is not just production that is missed but also consumption and capital formation. Consumption of own production may make a significant contribution to welfare while own account capital formation, including intellectual capital formation, may make a significant contribution to the growth of both recorded and unrecorded production. The activities are not only important in themselves but they also interact with market activities.

6. This paper first takes a brief look at the properties of a system of accounts based entirely on monetary transactions and then considers how the inclusion of non-monetary transactions affects this system. The existing SNA is based mainly on monetary transactions. The present economic and financial crisis suggests that there is a continuing need for a system of accounts of this kind. However, it is also clear that for certain analytic and policy purposes the coverage of the accounts needs to be extended to include more non-market activities and non-monetary transactions. It is not easy to decide what is the most appropriate way in which to resolve these conflicting requirements.

7. The second part of the paper addresses a more specific issue namely the treatment of interest and capital services in the production account of the SNA. The treatment of interest in the SNA is not satisfactory in several respects. One consequence is that the measurement of the inputs into production provided by fixed assets has been made unnecessarily complicated.

### Monetary transactions and net lending/borrowing

8. Traditional double entry book keeping is employed in national accounts. A transaction between two economic units gives rise to a pair of matching debit and credit entries in the accounts for each party. For example, the sale of output requires an entry under 'resources' in the seller's production account and a counterpart entry of equal value under 'changes in assets' in the seller's financial account to record the cash or short term financial credit received in exchange. Similarly, if the purchaser uses the output for consumption, an entry is recorded under 'uses' in the use of income account of the purchaser and an entry under 'changes in assets' in the financial account to record the cash paid or short term liability created.

9. In a system of macro-economic accounts that embraces both parties to a transaction, a transaction between two economic units gives rise to four simultaneous entries of equal value. This method of recording is therefore described as quadruple entry accounting.

10. In the 1993 SNA, transactions are recorded in the sequence of accounts from the production account, Account I, to the financial account, Account III.2. These accounts are therefore described here as the *transactions accounts*<sup>1</sup>. For convenience, the non-financial transactions accounts will also be described here as *real accounts*. They consist of the set of accounts from the production account, Account I, to the capital account, Account III.1.

11. The remaining flow account in the SNA consists of the “other changes in assets account” which is essentially a table that records changes in assets or asset values that are not attributable to transactions between economic units. Finally, the system also includes the opening and closing balance sheets which record the values of stocks of assets at a point of time.

12. Transactions may be monetary or non-monetary. A monetary transaction is one in which one party makes a cash payment or incurs a short-term financial liability in exchange for the good, service or asset provided by the other. Thus, a monetary transaction typically gives rise to an entry in one of the real accounts and a matching entry in the financial account of each of the parties concerned. However, purely financial transactions that involve the exchange of one financial asset/liability for another appear only in the financial account. For example, a lender provides cash to a borrower in exchange for a newly created financial instrument in the form of a loan or bond drawn on borrower.

13. Except for purely financial transactions, each monetary transaction requires an entry in one of the real accounts matched by an entry of equal value in the financial account for each party to the transaction. It follows that the algebraic sum of the entries in the real accounts and the sum of the counterpart entries in the financial account for all the transactions in which an economic unit engages must be identical. In other words, the net change, whether positive or negative, in the value of the unit’s real resources resulting from monetary transactions has to be matched by an equal net change in financial assets or liabilities.

14. This identity emerges in the SNA sequence of macro accounts in the form of the identity between net lending and borrowing as recorded in the capital and financial accounts. The net lending or borrowing requirement generated by the monetary transactions associated with all real activities in which the unit engages must be met by a net change in financial assets and liabilities of equal value. The identity holds at the level of an individual economic unit and also on aggregate for a group of units such as a sector.

15. The identity is not disturbed by introducing non-monetary transactions into the accounts such as internal transactions or barter transactions. In an internal transaction, simple double entry book-keeping suffices as only one economic unit is involved. As the value of the entry under ‘resources’ is equal to that under ‘uses’ no borrowing or lending requirement is generated and no entries are recorded in the financial account. Similarly, a barter transaction in which goods and services are

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<sup>1</sup> In Chapter 2 of the 1993 SNA, the expression ‘transactions account’ is used in a somewhat different sense from here to denote a “dummy” or “screen” account. In the present context a ‘transaction account’ simply means an account in which the entries refer to the values of goods, services or assets exchanged in transactions.

exchanged for each other gives rise to two entries of equal value, one under 'resources' and the other under 'uses' in the real accounts of each of the parties. They cancel each other out when the accounts for the two units are aggregated. Again, nothing is recorded in their financial accounts.

16. There is however an important difference between the capital and the financial accounts in the status of the item 'net lending/borrowing'. In the financial account net lending/borrowing is the balancing item for all the financial transactions recorded in the account and may be calculated independently of the other accounts in the system. However, net lending/borrowing is not the balancing item for the transactions in real assets recorded in the capital account and it cannot be calculated from these transactions alone.

17. In the SNA, the first entry in the capital account is net saving which is carried over from the preceding sequence of current accounts. Net saving provides the link between the capital account and the other real transactions accounts. In effect, net saving shows the net lending or borrowing requirement generated by all the transactions in the current accounts to which must be added the net lending or borrowing requirement generated by the transactions in the capital account in order to arrive at an economic unit's overall net lending or borrowing requirement. It is this overall requirement which is identical with net lending or borrowing as recorded in the financial account.

18. In a time of financial and general economic crisis, it is important that the interplay between real and financial activities should be clearly portrayed in the accounts. The accounts should be presented in such a way that the financial implications of the real economic activities in which economic units engage can be understood by users. The identity between the balancing items in the capital and financial accounts of the SNA reflects the fact that the set of monetary transactions recorded in the transactions accounts constitutes a closed system. Only  $n-1$  of the  $n$  balancing items in the SNA transactions accounts are independent. These inter-dependences show that the set of transactions accounts as a whole can be viewed as a simple general equilibrium system in which the monetary transactions associated with the real activities taking place in an economy generate an overall net lending or borrowing requirement that must be matched by the net change in the economy's financial assets and liabilities.

19. The transactions accounts therefore constitute an *articulated system of inter-dependent accounts*. They are treated as such in the 1968 SNA where the sector accounts are effectively the same as the complete set of transaction accounts as defined here. However, the 1993 SNA chose to split the transactions accounts into two groups by emphasizing the distinction between current accounts and capital accumulation accounts. The accounts that record transactions in real and financial assets, namely the capital and the financial accounts, were split off from the current transactions accounts and grouped with the 'other changes in assets accounts' and the balance sheets. As a result, the accounting structure in the 1993 SNA obscures the fact that the transactions accounts constitute a closed system of accounts in themselves.

## Demands on the accounts for short and long term analysis

20. Until very recently, it seemed that monetary and fiscal policies in most developed countries were no longer very concerned about economic stabilisation and were more concerned about increasing long term growth potential. In these circumstances, some shifts in priorities in national accounts would seem to be called for to supply data that are better suited to the analysis of long term growth and the needs of policies designed to promote growth.
21. Unfortunately, however, the recent crisis has shown that the cycle is not extinct after all. Restoring stability in real and financial markets has suddenly become the over-riding priority for fiscal and monetary policies throughout the world. The need for appropriate data to guide analysts and policy makers through periods of major market disequilibria and short term crisis turns out to be as strong as ever. The option of replacing the present SNA by a more broadly based system that includes many more non-monetary transactions no longer looks very attractive
22. The existing SNA is meant to be a multi-purpose system designed to meet a variety of analytic and policy needs. Traditionally, national accounts have included all the monetary transactions associated with the real activities of production, consumption and accumulation. They have also tended to resist the inclusion of non-monetary transactions. The inclusion of some, but by no means all, types of non-monetary transactions in the SNA is a compromise that tries to meet as many needs as possible but may not be ideal for any specific purpose.
23. The present financial crisis has shown that there is still a continuing need for a system of accounts based predominantly on monetary transactions. In times of financial crisis the main focus of interest is the system of monetary transactions accounts embedded within the SNA as currently defined. The inclusion of a somewhat arbitrary selection of non-monetary transactions in the system may actually detract from the usefulness of the accounts for purposes of monitoring and analysing short-term fluctuations and market disequilibria.
24. The issues under consideration are not new. During the discussions leading up to the 1993 SNA, there was support for the idea of having a narrow concept of GDP based exclusively, or almost exclusively, on monetary transactions with a second concept with wider coverage that would include many non-monetary transactions. However, it was felt at the time that the prospect of having two different measures of GDP would cause confusion and would not be acceptable to many users.
25. The issue is not just about the production boundary and the scope of GDP, however, but about the desirability of including a whole range of economic activities in the accounts by extending the coverage of the non-monetary transactions. Pressure to extend the system has come from several quarters and not only from growth analysts. For example, the SNA has been criticised for not properly reflecting the role of women in the economy because the accounts do not cover many types of household production for own consumption that are typically done by women. To include all these activities it would be necessary greatly to expand the number of internal non-monetary transactions recorded within households. Some own account production is already included, of course, notably the own account production of housing services

by owner occupiers. Recent studies have indicated that including the whole of the output from household production for own consumption in GDP could increase it by between 25 to 50 per cent depending on the country and period of time.

26. Own account household production is by no means all destined for consumption. The production and acquisition of knowledge and skills by students could be treated as a form of household own account production. This production leads to own capital formation. For many analysts it is the failure of the existing system to record the capital formation that is the main concern rather than the failure to record the production.

27. Non-market activities of this kind are intrinsically different from market activities and their movements may also be different. As they have no direct financial implications and are not subject to the same cyclical fluctuations as market activities, their inclusion in the SNA could actually reduce the usefulness of the accounts for short term analysis. Another disadvantage of including them is that the data are relatively unreliable. As there are no data on sales and purchases it is difficult to estimate the actual quantities of goods and services produced and consumed, although the situation may be improving as more time use surveys are conducted. Much more seriously, there are no prices to go with the actual quantities so that prices have to be imputed. There may not even be consensus about the most appropriate way in which to impute the prices, especially for services.

28. There appear to be two ways of responding to the demands to include more non-monetary transactions in the accounts. The first would be to replace the existing system of accounts by a substantially revised and extended system that covers many more non-market activities and non-monetary transactions. As already suggested, this seems to be a non-starter, not least because of the need to preserve some continuity in the national accounts data bases built up over the years.

29. On the other hand, the alternative of doing nothing seems to be equally unacceptable. Policies designed to promote economic growth are likely to work their way back to the top of the agenda in the next few years. There is a need not merely to construct more comprehensive measures of growth but to compile additional series that are needed to explain growth.

30. The only way out of the impasse is to have two systems of accounts: one geared primarily to short term analysis and the other to long term analysis. As already noted, this possibility has been discussed on various occasions in the past but has usually been rejected on the grounds that it would cause confusion and be unacceptable to users.

31. However, users consist mainly of professional economists in business or government and economic and financial journalists. They are already used to having alternative measures of inflation or the money supply. They are even getting used to having alternative measure of unemployment. The argument that two different measures of GDP, or GDP growth, would cause too much confusion may no longer be valid, at least in many countries. The essential point is that users should understand, and accept, which measure is the appropriate one for any particular purpose.

32. The conclusion reached here is therefore that an alternative system of official accounts should be developed to meet the requirements of analysts and policy makers interested in measuring and explaining the long term growth of output and welfare. However, these accounts should not replace the existing SNA accounts but supplement them. In practice, this solution is very similar to developing a system of satellite accounts, but ultimately the alternative accounts should not to be seen as subordinate to the 'main' accounts if they are to carry the same weight among users.

### Interest and capital services

33. The remainder of this paper is devoted a specific and more concrete issue that seems to have been a matter of some controversy during the current revision. Over the last two decades there has been a demand from many economists that the production account of the SNA should include inputs of capital services along with inputs of labour services. The growth of productivity cannot be accounted for, or properly explained, unless all the inputs into production are recorded correctly at their current market values. This raises the somewhat larger issue of the format of the production account itself and the treatment of interest. The purpose of the production account is record the values of all the inputs and outputs from a productive process. The 1993 SNA split the production account into a so-called production account (actually a value added account) and the generation of income account. The present discussion refers to a production account that recombines the two: that is, to a traditional production account that relates to the production function as understood in economics.

34. The main question addressed here is the appropriate way in which to record the value of the services contributed by fixed assets to production. When the fixed assets are hired or leased the services are straightforwardly valued by the actual market rentals paid. The rental is the price payable for the use of a fixed asset in production over a stated period of time. It is the equivalent of the wage rate, the price payable for the work done by an employee over a period of time.

35. For renting to be viable as a market activity the rental charged has to cover the total costs of the unit that owns and makes a business of renting assets. In addition to any administrative or maintenance costs, the rental has to cover the depreciation on the asset and the interest charged on the funds borrowed to purchase the asset or the interest foregone when purchased out of own funds. For long lived assets with low rates of depreciation such as housing and other structures, the interest foregone may be much larger than the depreciation.

36. Many types of fixed assets are owned by their users rather than rented. When an enterprise owns its fixed assets it acts in two different capacities: as an asset owner as well as a producer. An internal transaction takes place in which the owner rents the asset to the producer. Following standard SNA valuation principles, the rental can be valued by the market rental that would be paid to rent an identical asset. The imputed rentals measure the values of inputs provided by fixed assets that are owned by their users.

37. It is worth a slight digression to note that imputed rentals are by no means the only internal transactions that need to be recorded in a production account, even when

the production is for the market. As explained in some detail in Chapter 6 of the 1993 SNA, market output consists of sales plus changes in the inventories of finished goods and work-in-progress, while intermediate consumption consists of purchases less changes in inventories of materials or semi-finished goods. When output is not immediately sold but put into inventory, the enterprise again acts as both producer and asset owner. An internal transaction takes place in which the producer 'sells' the output to itself as an asset owner. The increase in inventory is recorded in the enterprise's capital account so that production for inventory could be viewed as a special form of own account capital formation.

38. In general, the flows of goods into and out of inventories are recorded in the SNA by internal transactions. The quantities of goods entering and leaving inventory are valued at their current market prices at the times the entries or withdrawals take place and not at the actual prices at which the goods may have been purchased or are eventually sold. The two sets of prices could be very different when there is inflation. In general, therefore, the values of both output and intermediate consumption are partly based on the values of internal transactions. Even the measurement of the gross value added from market production depends to some extent on internal transactions.

39. In some countries there may no rental markets for many types of fixed assets or, if the markets do exist, they are relatively small, inefficient and untypical. In this case, again following standard SNA principles, the market rentals have to be estimated by the sum of the costs incurred in providing the assets for hire. As just noted, these costs may include some administrative and maintenance costs but the bulk of the costs consist of depreciation and interest paid or foregone. However, a serious problem is created by the fact that the SNA does not treat interest as a cost of production.

40. The SNA production account treats depreciation, or consumption of fixed capital, as a cost of production but it does not record the interest paid or the interest foregone on the value of the assets when they are purchased out of own funds. It is worth looking at the background to this issue.

41. In the early days of the SNA, the production account did in fact include actual *interest paid* along with depreciation<sup>2</sup>. The amount of interest paid, however, depends on the extent to which the fixed assets are financed out of loan or equity capital. The relevant interest to be charged in the production account should be the total interest payable on the current value of the fixed assets whether this consists of actual interest or interest foregone<sup>3</sup>.

42. Interest was dropped from the production account of the SNA in the 1968 revision without any explicit explanation. The net operating 'surplus' is derived before any interest payable is deducted. This remains the situation in the SNA. In the

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<sup>2</sup> See, for example, p.38 of the 1958 edition of the OEEC's *Standardized System of National Accounts* where net value added is broken down into "compensation of employees, interest and operating profit". This net operating profit, the balancing item of the production account, is not the same as the net operating surplus of later vintages of the SNA.

<sup>3</sup> This point has been made by many economists. See, for example, pp. 101, 102 of *The Design of Economic Accounts* (1970) by Nancy and Richard Ruggles,

1993 SNA the interest payable on assets used in production is not recorded in the generation of income account which, as already noted, is the lower half of a conventional production account. Any actual interest paid is recorded under uses in the allocation of primary income account but interest foregone does not appear anywhere in the accounts.

43. However, the interest payable on fixed assets used in production is not some kind of discretionary payment, such as a dividend, made out of an operating 'surplus' created by production. It is clearly an inescapable cost of production that has already been incurred and which should therefore be recorded in the production account. The net operating surplus is not all surplus if there are outstanding liabilities that have been incurred purely as a result of engaging in production and which have still not been charged against production.

44. If the total interest payable on fixed assets were to be recorded in the production account, the operating surplus as currently defined would be reduced by an equal amount. This lower surplus would be carried forward as a receipt in the allocation of income account but the interest receivable by the enterprise in its capacity as property owner would also be recorded so that the balance of primary incomes would be unchanged. From the perspective of the allocation of primary incomes account the change is not very radical. However, the change in production account is fundamental as it permits the full costs of using fixed assets to be properly measured.

45. The sum of depreciation and the corresponding interest payable on the current value of the fixed assets in question provides a measure of what is now known as capital services. In the current revision of the SNA, capital services are discussed at some length. The term 'capital' may not be ideal because of ambiguities in the meaning of 'capital' and confusions between real and financial capital, but the expression 'capital services' is deeply entrenched in the literature. The issue is not a theoretical one about 'capital', however, but a practical one about the correct way to record the value of the inputs into production made by fixed assets.

46. The approach taken in the current draft of the SNA is somewhat different from that taken here but in the end leads to very similar estimates. When possible and appropriate both approaches would value 'capital' services by market rentals. However, when they have to be estimated by costs the draft SNA proposes the sum of depreciation plus the return on the assets instead of the sum of depreciation plus the interest payable on the value of the assets. In practice, the two methods will yield similar results, especially if the rate of return used is an exogenous one based on some appropriate market rate of interest.

47. If the rate of return is endogenous it will depend on the value of the output produced. This implies that if the cost of the capital services used in production is measured using an endogenous rate of return the value of an input into production is made to depend partly on the value of the output. However, it should be possible to value the costs of the inputs into a particular process of production independently of the production process itself or the outputs from that process. The general concept of opportunity cost seems to imply such independence as it is determined by the maximum benefit that could be derived by using resources differently.

48. In practice, it may make little difference to the costs of capital services whether they are estimated using a rate of interest or a rate of return. The real difficulty lies in estimating the other major component of capital costs, namely depreciation at current cost. This was explicitly recognized in the 1993 SNA where countries were given the option of calculating all balancing items in the accounts gross if it was too difficult to estimate depreciation satisfactorily.

49. Considerable advances have been made over the few decades, however. The concept of depreciation has been clarified and a theoretically satisfactory method of estimating it has been developed as a result of the development of the perpetual inventory method of estimating the capital stock, or PIM. This method was already described, and its use recommended, in chapter 6 of the 1993 SNA. Very briefly, the current value of a fixed asset is equal to the present discounted value of the stream of expected future rentals it is capable of generating. Depreciation is then measured by the decline in the current value of the asset from one period to the next. There is an extensive literature on the subject.

50. One major attraction of the PIM method is that all the relevant stocks and flows are estimated in a consistent manner. Estimate of the current values of the gross and net stocks of fixed assets at the beginning of the period are automatically generated. The interest payable on funds of equal value to the net stock is therefore simple to estimate once an appropriate interest rate has been selected. On the other hand, depreciation is perhaps the most difficult concept from a theoretical viewpoint in the SNA as well as probably the most difficult major flow to estimate in practice. If depreciation is actually calculated and recorded, there would seem to be no justification for not recording the associated interest costs, whether the production account refers to an enterprise or to an establishment. The interest cost is conceptually simpler and easier to understand as well as being easier to estimate.

51. No convincing case has been made that would justify the exclusion of interest costs from the production account. If the interest payable on the value of the assets used in production were recorded in the production account as well as depreciation all the information needed for the calculation of capital costs would be available. When both are recorded, the balancing item of the production account becomes net operating profit as it was defined in earlier versions of the SNA. As already explained, however, the net operating surplus as now defined in the SNA is not a true measure of the surplus generated by production because the inputs contributed by the fixed assets are systematically undervalued. This is a serious anomaly that needs to be corrected. The opportunity to do so in the present revision should be taken.