

REVISION OF THE SYSTEM OF NATIONAL ACCOUNTS : A NOTE ON OBJECTIVES AND KEY ISSUES

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INTRODUCTION

The United Nations **System of National Accounts** (SNA) defines income, consumption, saving and investment as these terms are presently understood by economists throughout the world. The present SNA was issued more than twenty years ago (United Nations, **1968**) and is now being reviewed with the intention of bringing out a revised version in the early **1990s**. The review process is being managed by an "Inter-Secretariat Group" consisting of staff members of the OECD, the United Nations Statistical Office, the International Monetary Fund, the Statistical Office of the European Communities and the World Bank. During the past three years, the Group has organised a number of meetings for statisticians working in national accounts and related areas to review the various parts of the SNA. The purpose of this note is to summarise the more important proposals for changes to the System that have been discussed at these meetings and to invite comments and suggestions from economists and others who make use of national accounting statistics.

The present SNA introduced a number of major changes to the former system which it replaced (United Nations, **1953**). It completed the accounting circle by linking the transactions during the period with the opening and closing balance sheets; it introduced an input-output matrix showing the transactions in goods and services that take place between producers; it provided a flow-of-funds matrix detailing the lending and borrowing between sectors of the economy; and it indicated what types of transactions should be calculated at constant prices and how this should be done.

The review now going on will not involve any changes or additions as far-reaching as these, and indeed the review has been undertaken on the premise that the basic framework of the present system should be retained. To a large extent the review is concerned with clarification and updating. **Clarification** because the "Blue Book" and the associated manuals which describe the present SNA have been found difficult to understand both by users and compilers, and **updating** because of the changes which have occurred during the past two decades in the nature of economic institutions and in the ways that they do business. The new version will need, for example, to provide explicit guidelines on the treatment of value-added taxes, financial leasing, employment promotion schemes, NIFs and RUFs (note issuance facilities and revolving underwriting funds, respectively). But in addition to what are

essentially housekeeping operations, the review has also dealt with a number of more fundamental questions about the definitions of income, consumption and investment. These concepts are central to the study of economics and changes to them will have important implications for the ways in which future generations of economists view the world.

The review is concerned only with the definitions and classifications underlying the accounting system and not with problems of estimation. A series of separate manuals dealing with estimation procedures is being prepared by the United Nations Statistical Office. These will deal, for example, with the coverage of the underground economy and illegal activities (both of which are, in principal, included in the system) and they will also discuss improved methods of estimating service output at constant prices. Important though these questions may be, the discussion below deals essentially with conceptual issues— income, investment, consumption, natural resources, the production boundary and the role of imputations.

1 INCOME

The most generally accepted definition of income, proposed by Sir J.R. Hicks (1946) is the maximum value which a person can consume during a given period while remaining as well off at the end as at the beginning of the period. While the authors of the present SNA probably had a concept of this kind in mind, the present system fails to measure Hicksian income in at least two respects.

First, when relative prices of assets are changing, asset owners will receive holding gains (or losses) that enable them to spend more (or require them to spend less) than their current income as measured in the present SNA in order to be just as well off at the end of the period. Second, even in the absence of relative price movements, any general tendency for prices to rise means that the return on financial assets will include an amount, in addition to "real" interest, which is designed to compensate asset holders for the loss in the real (i.e. inflation-adjusted) value of their assets. As total interest and not just the real part is presently included in disposable income, SNA income overstates income as defined by Hicks. People who spend all their interest receipts will be worse off at the end of the accounting period because the value of their financial assets will have declined when adjusted for inflation.

The SNA reviewers have considered whether to resolve the first of these problems by taking holding gains out of the reconciliation accounts where they presently appear (these accounts reconcile the flow accounts with the balance sheets) and showing them as current receipts in the income and outlay accounts. If this were done, saving would equal the change in net worth, and disposable income would clearly be a better approximation to Hicksian income.

This proposal was rejected partly on practical grounds; only a handful of countries can measure holding gains with an acceptable level of accuracy and it is not very useful for an accounting system designed for world-wide use to make recommendations that have virtually no chance of being applied by most countries. Practical considerations apart, there are also some theoretical objections to including all holding gains in income. Holding gains arising from *relative* price movements are generally *unexpected*, and just because they are unexpected, the recipients will not usually allow them to directly influence their consumption. For example, when house prices rise less than the general level of inflation, many house owners will not reduce their consumption at all and very few will reduce it by the full amount of their holding losses. Would measures of income that include holding gains from relative price movements be useful for studying consumption and savings behaviour? Uncertain of the answer, the SNA reviewers have preferred not to change the present treatment of holding gains, but to show them as memoranda items in the income and outlay accounts so that – for the countries which are able to calculate them – analysts can decide for themselves how they wish to take them into account.

As regards the second question – whether to show real interest rather than nominal interest in the income and outlay accounts – the important point to note is that the gains and losses that are experienced by holders and issuers of financial assets are, to a large extent, *expected*. They may, of course, vary around some long-term trend so that the amounts that asset holders lose (and asset issuers gain) from inflation cannot be foreseen with certainty for any particular period. But the direction and approximate size of the gains and losses can be safely predicted and they can be expected to recur for several years to come. The gains and losses on financial assets and liabilities when the general price level is tending to rise or fall are therefore quite different from the unforeseeable gains and losses associated with relative price changes. The former are regular, expected, and directly affect consumption, and so there is a strong case for including them in income.

The SNA reviewers, however, have not so far supported the idea of replacing nominal interest by real interest. They have argued that payments and receipts of nominal interest are observable transactions which should be faithfully recorded in the accounts. One way around this objection would be to record the difference between nominal and real interest payments as an (imputed) current transfer. The accounts would then continue to show asset issuers as paying the full nominal interest, but would also show them as receiving an imputed transfer from the asset holders. This solution has not yet been discussed in detail.

External trading gains – the gains or losses from movements in export and import prices – are another issue in the measurement of income. The traditional way of measuring the trading gains, suggested by Nicholson (1960), involves deflating the nominal trade balance by an index of import prices to obtain a measure of the import-purchasing-power of exports. However, a number of other techniques have been suggested, most of which involve deflation of the nominal trade balance by av-

erages of import and export price indices'. One of these latter, proposed by Kurabayashi (1971) has the advantage that, with perfect statistics, trading gains sum to zero at the world level. This makes it an attractive method for use in a world-level system such as the SNA is designed to be. On the other hand, the trading gains so calculated do not have the simple and unambiguous interpretation of the Nicholson measure.

The present SNA briefly discusses the problem of measuring trading gains, but makes no standard recommendation because it concludes that no single solution is suitable for all purposes. Despite periodic reviews of the problem over the last two decades this conclusion remains valid. But although there is no agreement on a single method that is best for all purposes, the SNA reviewers have agreed that the revised SNA will recommend a method to be used for international reporting. The choice has been narrowed to the easily-interpretable Nicholson method and the "balanced" method proposed by Kurabayashi.

The present SNA contains no measures of real income; national and disposable income are only shown in nominal terms. The present SNA confines the measurement of real measures to **commodity** flows, i.e. those which can be decomposed into prices and quantities. These are consumption expenditures, capital formation, foreign trade, gross output, intermediate consumption and (as the difference between the last two) value added. Commodity flows can be unambiguously converted to "real" terms because the underlying quantities can be revalued at a constant set of prices. The **income** concepts of national accounts, however, are obtained by adding various kinds of non-commodity flows (mainly transfers) to these basic commodity flows. Non-commodity flows cannot, by definition, be expressed at constant prices. It is true that they can be expressed at constant **purchasing power** by deflating them by an index of the prices of some basket of goods and services which non-commodity flows might be used to purchase, but there are a large number of baskets that could plausibly be selected. As there is no unique solution for converting non-commodity flows into real terms, the SNA refrains from making any standard recommendation.

In practice, of course, users of national accounts need measures of real income, however imperfect they may be, and for this reason the next version of the SNA will recommend a standard procedure for calculating national and disposable income in real terms. However, while this much is agreed, the actual method to be used remains an unsettled matter. There are two alternatives, which can be referred to as the component and global methods.

To obtain real national disposable income, for example, the component method starts from constant price GDP and moves to the measure of real income by considering the following components:

1. **Gross Domestic Product at constant prices**
2. less Exports of Goods and Services at constant prices
3. plus Imports of Goods and Services at constant prices

4. equals **Gross Domestic Expenditure at constant prices**
5. less Consumption of Fixed Capital at constant prices
6. equals **Net Domestic Expenditure at constant prices**
7. plus Net Exports of Goods and Services in real terms
8. plus Net Foreign Factor Incomes received in real terms
9. plus Net Foreign Transfers received in real terms
10. equals **National Disposable Income in real terms.**

The derivation of Net Domestic Expenditure – line 6 – is perfectly straightforward since the components involved are all commodity flows and so can be expressed at constant prices. Line 7 is the external trading gain and could be calculated using one of the methods described above; for example, net exports could be deflated by the import price index. Lines 8 and 9 could be expressed in real terms using a price index relating to the kinds of goods and services on which these receipts might have been spent. As it is difficult to know what these goods and services might be, a general price deflator would probably have to be used such as the implicit deflator of Net Domestic Expenditure.

The component method has an instinctive appeal to national accountants because it uses the kind of accounting framework with which they are familiar, but it also has the drawback that it is a hybrid measure which is partly at constant **prices** and partly at constant **purchasing power**. It is easy enough to **describe** the measure of real national disposable income so obtained as "net domestic expenditure at constant prices plus net foreign receipts at constant purchasing power". But can it be **interpreted** in any meaningful fashion by analysts and policy-makers?

The **global method** is much simpler. It merely involves deflating national disposable income in nominal terms by a general price index, the favoured candidate being the implicit deflator for Net Domestic Expenditure. Real national disposable income so obtained, has a straightforward interpretation – namely the volume of goods and services entering into Net Domestic Expenditure that could have been purchased at base-year prices. This is a clear and useful way of defining real NDI; it is a simple method from the point of view of calculation and it is essentially the method commonly adopted by users who are frustrated by the absence of real income measures in the present SNA.

II. INVESTMENT

In the present SNA, investment ("capital accumulation" in SNA terminology) is confined to outlays on reproducible tangible assets that are used in production during several accounting periods – plant, machinery, structures, work in progress, etc. – plus some intangible assets such as patents and copyrights. This definition has been criticised as being too restrictive in a number of respects.

First, it excludes outlays on computer software which are increasingly being regarded as capital expenses by both business and tax authorities. Expanding the coverage of investment to include software does not really involve a basic change to the present SNA. Software is reproducible, it is usually tangible since most software is purchased as a physical object such as magnetic tape or diskette, and it is used in production over several years. All that is required is to expand the list of capital goods specifically to include computer software, and the SNA reviewers have agreed, in principle, that this should be done for the next version of the **SNA**.

A second proposal to extend the scope of investment is to include research and development expenditures (R&D) incurred by enterprises. At present these are treated as intermediate consumption and are deducted from gross output to obtain value added. However, the output generated in a given year bears no relationship to that year's R&D expenditures, **so** it appears to be a mistake to treat it as a cost of producing that year's output. Moreover, R&D expenditures are generally expected to produce an income flow over several future periods, **so** that it would seem more appropriate to treat them as investment outlays. The SNA reviewers have agreed that, in principle, this should be done, but there are several important details which will require further consideration.

One of these is whether to include R&D expenditures **incurred** by enterprises or rather the value of R&D work **performed** by enterprises; the latter would include, for example, the considerable amount of research carried out by defence industries but funded by government. A second question is how to estimate R&D output in constant prices; probably there is no alternative to the use of the rather unsatisfactory input methods now used for obtaining government output in real terms. The biggest question mark, however, is how to calculate depreciation. One possibility would be to assume that R&D expenditures have **infinite** service lives on the grounds that the benefits of R&D live on for ever; new knowledge is used but never used up. In practice, however, the benefits of a given R&D project become less useful as the years go by and rival innovations appear. If R&D expenditures are assumed to have **finite** lives, these could be based on "product cycles" – the periods over which companies expect to continue producing goods and services incorporating the results of some particular R&D project. Another possibility would be to use "patent-life" as specified in each country's patent laws. The results of R&D may well continue to be useful for many years after the expiration of patents but they are likely to have a reduced impact on output and profits after this date.

Treating enterprise expenditures on R&D as a form of capital formation instead of as intermediate consumption would increase the GDP of the biggest R&D spenders – Belgium, the Federal Republic of Germany, Japan, the Netherlands, Sweden, and United Kingdom – by between one and two per cent and would have significant implications for gross output, value-added, investment, income and saving for the enterprise sector. It would also involve an important expansion of the concept of investment which would now include a form of "immaterial" investment.

A third suggestion is to treat mineral prospecting as investment. Like R&D, outlays by mining and oil companies on the search for new deposits are now shown as intermediate consumption, and with similar reasoning applied above to R&D it seems preferable to classify such outlays as a form of investment. Data on mineral exploration expenditures are readily available from mining companies and there are no practical difficulties in showing them as capital outlays rather than intermediate consumption. Depletion could be calculated by reference to the expected lifetimes of mines and oil wells in the case of successful mineral exploration; prospecting expenditures that do not produce the desired results could be written off in the accounting period in which they are incurred.

if, as seems likely, it is decided to treat prospecting outlays as a form of capital formation, the resulting data on formation and consumption of capital could be interpreted in a way that is of special interest to environmental economists. Other things being equal, mining companies can be expected to incur prospecting expenditures up to the point where the marginal dollar spent equals the marginal return on the mineral deposits they expect to find. This means that – at least at a world level and averaged over several years – outlays on mineral prospecting will tend to equal the market value of new finds of subsoil assets. Likewise, the depreciation of mineral prospecting, i.e. the reduction in the market value of proven reserves of subsoil assets, can be treated as depletion of mineral reserves. In short, the national accounts, at least at a world level, will include the value of newly discovered mineral deposits in the GDP, and the depletion of mineral reserves in capital consumption. This will clearly bring measured GDP closer to the environmentalists' concept of "sustainable GDP".

III. CONSUMPTION

In the present SNA, final consumption expenditure is calculated for three sectors, namely households, government and non-profit institutions. Two main questions have been discussed in this connection – the relationship between **consumption** and **consumption expenditure** and the possibility of creating a new category of final consumption expenditure for the fourth sector of the domestic economy, **enterprises**.

As regards the first question, it has often been noted that consumption is not synonymous with consumption expenditure. A sector may consume goods and services for which it has not paid; more specifically households consume goods and services paid for by government and private non-profit institutions. The relationship between consumption and consumption expenditure is demonstrated in the simple matrix below which cross classifies consuming and spending sectors.

Spending sector	Consuming sector	Households	Government	Private Non-profit Institutions	Total
	(1)	(2)	(3)	(4)	
Households	(1)	a	–	–	a
Government	(2)	b	c	–	b+c
Private Non-profit	(3)	d	–	e	d+e
Total	(4)	a+b+d	c	e	a+b+c+d+e

The fourth column gives the consumption aggregates contained in the present SNA; these are the final consumption **expenditures** incurred by households, government and private non-profit institutions. The fourth row shows **consumption** by these sectors. Household **consumption** exceeds household consumption **expenditure** by the value of the goods and services which households consume but which are paid for by government and non-profit institutions. Similarly, consumption by government and non-profit institutions is less than their consumption expenditures by the amount of goods and services which they deliver to households.

Underlying this matrix is a distinction that is not made in the present SNA, namely between "individual" and "collective" consumption. "Individual" refers to current outlays by government and non-profit institutions on goods and services that are supplied to **individual**, identifiable households. The main examples are education, health and welfare services. "Collective" refers to expenditures incurred in providing services like defence, law and order and public administration which are consumed **collectively** by the community as a whole.

The SNA reviewers have agreed that the consumption aggregates shown in the bottom line of the matrix should be included in the revised SNA. They will not, of course, replace the existing expenditure measures shown in the right-hand column. The **SNA** reviewers have noted that these new consumption aggregates are generally more appropriate for international comparisons of consumption because there are important differences between countries in the public/private mix of health and education services. And they also provide useful information for assessing changes in consumption levels within a single country: it is clear that consumption expenditure (**a**) may move very differently over time from consumption (**a+b+c**).

The second question about consumption is whether certain expenditures by enterprises that are now treated as intermediate transactions should rather be classified as final consumption expenditure. Two categories of expenditures are involved here: first, outlays that directly benefit employees such as the provision of free or subsidised sporting facilities and day-care centres for children and, second, expenditures that incidentally or directly benefit the population at large such as

commercial sponsorship of cultural and sporting events and advertisement-funded television. With regard to the second category, it has been argued that differences between countries in the way that entertainment services are funded impair international comparisons since in countries where television is entirely funded by advertising, household consumption expenditure will be lower than in countries where television is directly paid for by consumers.

The SNA reviewers decided to reject the introduction of final consumption for enterprises. Their main argument was that any benefits to the general public are incidental, and these various expenditures are primarily undertaken to increase enterprise revenue. They are properly to be considered as intermediate costs of production.

IV. ENVIRONMENT AND NATURAL RESOURCES

The present **SNA** – and indeed national accounting in general – has often been criticised for failing to take account of environmental degradation and depletion of natural resources². While the two are logically distinct, they are here considered under a single heading because the same people tend to make both complaints.

By environmental degradation is meant the pollution of water, land and air. Suppose that two countries both produce the same number of identical products, but that in the first country the producers discharge large amounts of noxious chemicals into the air, while in the second country the producers are compelled to scrub gaseous discharge before releasing it into the atmosphere. Inspection of the two countries' GDP would not reveal the fact that the first country is worse off because its citizens are breathing polluted air. Might it, therefore, be appropriate to make an imputed deduction from the first country's GDP to reflect the environmental degradation that has occurred?

The SNA reviewers have answered no partly because of their natural reluctance to add any further imputations to the national accounts. A more important reason perhaps, is that they do not accept the implicit argument of the environmentalists that the national accounts should provide normative measures. Since the high polluting country has voluntarily accepted low environmental standards, why should that country's statisticians feel obliged to draw up national accounts that pretend that the country has adopted higher standards? However they may personally feel about pollution, the job of national accountants is to measure the world as it actually is and not what it might be like under different management.

Depletion of natural resources, such as petrol, mineral deposits, fisheries and forests, raises a different set of questions. Some of these resources, subsoil assets in particular, are alleged to be non-renewable, while others – whales and tropical

hardwoods for example – are being exploited at rates in excess of natural regeneration. It has been suggested therefore that the net value added of the mining, fishing and timber industries should be calculated after deducting depletion of the natural resources that they consume as well as depreciation of their fixed capital. This has again not found favour with the SNA reviewers and one reason has again been their reluctance to add further imputations into the accounting system; natural resources are not purchased from mother nature who produced them so that their valuation must inevitably be artificial and controversial. Another objection is that the national accounts ought not to show the using up of assets whose creation has not first been recorded in the accounts. There is a crucial difference between *depletion* (of natural resources) and *depreciation* (of man-made assets); unlike the first, the second refers to consumption of goods whose production has already been fully accounted for in the system. Nature is not recognised as a factor of production by economists or national accountants and nature's production of resources is not, and perhaps could never be, recorded in the accounts.

The lack of enthusiasm for measuring degradation and depletion in the next version of the SNA should not be interpreted as indifference to environmental concerns. While the SNA reviewers have concluded that the SNA is not a suitable framework for analysing environmental issues, they have strongly supported the work of United Nations agencies dealing with environmental matters by encouraging them to develop a system of satellite accounts. A considerable amount of work has already been done on these accounts by national administrations in France, Canada, Norway and elsewhere as well as by international agencies including the World Bank and the United Nations Environmental Programme. A manual describing a system of environmental accounts linked to, but separate from, the SNA is expected to be issued shortly after publication of the new SNA.

V. BOUNDARY OF PRODUCTION

Deciding what types of production are to be covered in the national accounts is a controversial issue. In this connection, there is particular interest in work performed in the home mainly, but not exclusively, by women. It is clear that most types of housework – cooking, cleaning, looking after children for example – are at least as difficult, time consuming and beneficial to the population at large as many types of work which are performed outside the home and which are, for that reason, included in the accounts. Moreover, the present SNA already includes imputations for certain types of home production for own consumption such as growing crops, raising livestock, milling grain and making wine and beer. Why not extend the production boundary to include other types of production for own consumption within the household?

The SNA reviewers have again taken a conservative line. The revised version of the SNA will explain the decision not to extend the production boundary to include housework by noting an important distinction between goods (e.g. crops for own consumption) and services (e.g. house-cleaning). For goods, production and consumption are *discreet* operations. After they have come into existence the producers can decide whether to offer them to a third party or to consume them themselves. It is therefore possible to value them at a market price – namely at what they could be sold for if the producers decide not to consume them themselves. With services, however, there is no intervening stage between production and consumption. People who clean their own houses are making *simultaneous* decisions about production and consumption; they decide at one and the same time both to produce the cleaning service and to consume it themselves. As there is no occasion when home produced services, *once produced*, can be offered on the market, there is no possibility of valuing them at market prices. There is no market for such production.

Those who find the above argument more like a rationalisation of the decision to exclude housework rather than a good reason for reaching that decision in the first place, may be persuaded by more practical arguments. The statistical difficulties of measuring the quantity of housework produced are formidable and no country – OECD or other – presently compiles reliable data on an annual basis. Even when the necessary information is available from occasional "time-budget" surveys there are severe problems in valuing production of housework. Several plausible valuation systems have been suggested in the literature, each of which provides widely different estimates of the value of housework³. The SNA reviewers asked themselves whether it would be helpful to inflate GDP – by up to 50 per cent depending on the basis of valuation – through adding dubious estimates of household production. They concluded that doing so would seriously detract from the overall accuracy as well as from the analytic usefulness of the national accounts.

VI. IMPUTATIONS

The present SNA contains a number of fictitious transactions which are commonly described as "imputations". People who live in their own houses are fictitiously assumed to pay themselves a rent for the privilege of doing so. Farmers who grow their own food are fictitiously assumed to pay money to themselves for what they consume. These are the best-known imputations recorded in the national accounts but they are by no means the only ones. Capital consumption and inventory changes are both imputations in so far as they do not involve transactions with third parties. The SNA also supports another kind of fiction by pretending that transactions that actually occur between A and B "really" transited via C. For example,

contributions that employers make directly to private pension funds on behalf of their staff, are shown in the SNA as first being paid as wages and then as being forwarded by wage-earners to the managers of the pension fund. To complete this particular fiction, the SNA pretends that the pension fund pays out to its contributors the interest earned each year on their total assets in the fund, and this amount is added to the disposable income of the pension fund contributors.

Some national accountants involved in the review process have suggested that it would be better to present the accounts in the form of a central "core system" confined to actual, observable transactions involving two separate economic units, with the various imputed flows shown in a complementary set of accounts. An important advantage of this approach would be that the information contained in the core accounts could be easily reconciled with data now published in government or company accounts and with data from household surveys which are necessarily confined to actual transactions.

However, most of the SNA reviewers have argued that the proposed core accounts would in themselves be of very limited interest. The various imputed flows in the SNA are designed to enhance the comparability of the national accounts both between countries with different institutional arrangements and within a single country when institutional arrangements change over time. They consider that the present imputations are an essential part of the accounting system. In short they considered that the present SNA – more or less in its present form – already constitute an irreducible core. It has been agreed that so far as possible the accounts should distinguish imputations from "real" transactions, but the latter will not be displayed as a separate core.

FUTURE PLANS AND CALL FOR COMMENTS

The United Nations plans to issue a first draft of the revised system in the second half of 1989. This draft will be circulated to national administrations and international organisations for comments and suggestions from the statisticians who will eventually have to apply the new system and from economists and others who make use of SNA statistics. This note has tried to identify the major issues that are likely to prove controversial in the consultation process that will follow the release of the first draft. Readers of this journal are invited to send any comments or suggestions they wish to make to the Editors, who will arrange to forward them to the Inter-Secretariat Group which is managing the SNA review.

NOTES

1. At least three kinds of averages have been proposed – the arithmetic mean of the prices of imports (P_m) and exports (P_x), i.e. $\frac{P_m + P_x}{2}$, an unweighted harmonic mean, i.e. $\frac{2}{1/P_m + 1/P_x}$ and a harmonic mean weighted by trade values, i.e. $\frac{X + M}{X/P_x + M/P_m}$. Pierre Gutmann (1981) gives a concise summary of these and other proposals.
2. For some years environmentalists have been promoting the concept of “sustainable income” which unlike conventional measures of national income makes allowance for degradation of the environment, depletion of natural resources and “defensive expenditures” such as health costs associated with pollution (Huetting, 1980, and World Bank, forthcoming).
3. Murphy (1982) identifies five valuation procedures that have been used to estimate the value of household work in the United States. For the year 1976 United States GNP would have been increased by between 26 and 47 per cent by the inclusion of housework depending mainly on the method of valuation.

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