

CONCEPTUAL INCONGRUITY IN THE NATIONAL ACCOUNTS

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This paper is presented as a general contribution to discussions underway with respect to the revision of the SNA. The author argues that underlying premises in the current (1968) version of the SNA tend to favour quantitative aspects of production and that the treatment of certain financial items such as interest and valuation of inventory change have been compromised in regard to their effects on production.

The need for alternative approaches to these components in the subaccounts of the SNA is emphasized, the rationale involved is explained and modifications to some of the subaccounts are proposed. The alternative approaches affect the boundaries of production and it is argued that the new boundaries would provide a more realistic representation of current values of gross domestic product. It is also noted that the modified production accounts are more compatible with the balance sheet subaccounts.

The author shows that production subaccounts on input-output and productivity are based on the need for quantitative measures in analysing growth in the volume of goods and services produced and of productivity to determine efficiency of factor utilization. It is argued that the existing conceptual structure of these two subaccounts meet these needs and should be retained in their present form.

INTRODUCTION

1.1. The proposed revision of the United Nations System of National Accounts (SNA) provides an appropriate opportunity to examine some of the basic concepts which underlie its subsystems. In this paper the author contends that the fundamental premises underlying the SNA were established at a time when the predominant focus was on measuring volume or quantity of production. This conclusion can be deduced from various comments in the literature that interpret money lending activity as not being production, interest transactions such as those on consumer and public debt as transfers, the substitution of physical for book value changes in inventories and on deflated expenditures and output in measuring growth, cyclical changes and productivity.

Subsequent development and extension of the national accounts framework has expanded its potential use to address a broader set of issues than those directly related to volume of production. This process, which now encompasses the compilation of financial data, has exposed a need to review the application of some of the original conventions within a wider context.

1.2. Current indications are that fundamental conceptual changes to the SNA are not being contemplated in the forthcoming proposed revision of the framework. One of the items that appears to have been eliminated is the recurring problem of the treatment of interest. It is contended in this paper that the national

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accounts current approach to this issue and to inventory valuation need serious reconsideration because, in this author's view, current concepts do not always show correct levels and changes in gross domestic product (GDP) measures, raise difficulties in understanding the contribution of capital input to production and in integrating production and finance accounts in meaningful analysis. The argument is made that questions such as whether interest is a factor cost or an intermediate expense, whether gains from holding inventories are a form of capital gain or a normal trading profit and whether depreciation should be recorded at replacement or historical cost in the Accounts are linked to a common source; a multiplicity of objectives in measuring the contribution of capital input to production.¹

1.3. For example, GDP can be compiled by three approaches: as the sum of value added by industries, as the sum of final expenditures and as the sum of incomes accruing from production. Under current practice all three approaches yield the same total. It is argued in this paper that theoretically they should not do so since the existing treatment of interest and inventory valuation is valid only for the derivation of value-added estimates in the context of special analytical uses of the latter series for productivity determination. The existing concepts with respect to these items are not appropriate for the compilation of expenditure and income based GDP as measures of the aggregate value of unduplicated economic production of goods and services at current market prices.

1.4. Here it is contended that in the derivation of GDP from component detail, the institutional and value added subsystems of the SNA should take different approaches to measuring the contribution of capital to production. With respect to the servicing of borrowed capital the institutional Income and Expenditure subsystems should follow market practices whereby interest paid is treated as an expense of the borrower and interest received as revenue of the lender of funds. Following the market-based approach to production in these Accounts, therefore, *interest received* should be perceived as production of the *lender*, indistinguishable from production generated by non-financial capital.

In SNA subsystems resting on the value-added approach, such as input-output and productivity measures, the primary concern of analysis is with the quantitative aspects of volume of goods and services produced and the efficiency of the capital stock. On this basis, capital's contribution to production is represented by the operating surplus, defined as operating profit before the payment of interest. Therefore, in contradistinction to the market's perception of interest as a cost to be deducted from a firm's operating revenue, in the value added accounts interest paid is not so deducted and in effect the generation of production represented by this interest is attributed to the *borrower* instead of to the *lender* of funds.

Thus the two approaches to the treatment of interest should yield different totals and different analytical results in the measurement of production, whether

¹A number of articles and comments in defense of and against national accounts practices with respect to interest can be cited, from Kuznets (1941), Speagle and Silverman (1953), Jaszi (1958), Sunga (1967, 1984); with respect to inventory valuation adjustment, in the writings of Kuznets (1941), Statistics Canada (1975), Haig (1973) and Hall (1981); and on the choice of depreciation estimates, in Statistics Canada (1975), Hibbert (1981) and Gilson (1984).

one considers the production of an industry or because of nonresident transactions, for the whole economy. Apart from interest, another component which calls for different approaches between the income-expenditure and the value added subsystems is the inventory valuation adjustment to profits which arises from differences in the valuation of inventories in the national and business accounts.

1.5. Input-output and productivity accounts are designed to reflect volume or quantity aspects of production. In these subsystems no distinction is made whether the financial capital involved is in the form of equity or whether it is borrowed. The contribution of both is treated as a factor cost which is represented by operating surplus inclusive of interest paid. The rationale for this is that productivity change is defined as a ratio between changes in quantities of output to changes in quantities of inputs, and the question of whether part of the capital input is owned or rented is not considered relevant for these calculations. In productivity calculations the inclusion of interest paid with operating profit and the deletion of inventory holding gains by an inventory valuation adjustment (IVA) serve to eliminate potential variations in costs of nonlabour inputs arising from whether owned or borrowed capital was involved in production and from differences in prices at which identical inventory items used might have been acquired and costed in estimating profits.

1.6. The Canadian System of National Accounts (CSNA) publishes subaccounts which reflect all three approaches to GDP. However, because of the different subaccounts, treatment of interest and inventory valuation is based on two fundamentally different concepts. Therefore, the income and expenditure based aggregates should theoretically differ, as indicated, from those obtained by use of the value added approach. In practice, the gross domestic product aggregates of the subaccounts are brought to a level which conceptually would be obtained by use of the benchmark value added approach by a set of three adjustments to the market-based income and expenditure data. These are (a) an adjustment to interest transactions with nonresidents which incorporates interest paid to and excludes interest received from abroad as production (b) an IVA adjustment to profits and net income and (c) an imputation for banking services to individuals and governments on the basis of present concepts in lieu of an interest shortfall on deposits.

Adjustment (a) is currently justified on the grounds that interest represents a distribution of a factor payment similar to dividends and that conceptually entries for interest and profits earned abroad by Canadian capital and those generated in Canada by nonresident capital have to be converted to a domestic form from a national basis. This reasoning is valid with respect to return on equity capital in the form of profits/net income. It is not applicable to interest payments and receipts if use of loan funds is considered as a service similar to other traded services, as contended in section 3 of this paper. Similarly as explained in section 4, the IVA can be considered as a partial inflation adjustment which should not conform to the current price gross domestic product. Finally if interest were treated as a service there would be no need for adjustment (c).

1.7. Historically, in the nascent period of development of the national accounts, many of the critical economic issues centered around resource allocation, distribution of production and productivity. Structure and concepts of the accounting system were governed by a need to provide the best measure of production in current and constant prices. Half a century later, and particularly in the past decade, there has been a significant shift in emphasis in the type of economic problems facing economists and a considerable expansion of the national accounting framework. The present situation demands that more attention be focused on financial conditions since the crises of recent years have revolved around international credit conditions, government deficits, rapidly rising prices, high interest rates, level of overall debt and the role and control of the rapidly expanding financial industry.

1.8. The emerging emphasis on financial aspects has brought with it a realization that production issues are intertwined with finance. Such factors as earnings ratios, debt service costs and cash flow are important in analysing the viability of firms involved in production and indeed, financial arrangements influence operating costs and efficiency in much the same way as factor costs and productivity affect the physical aspects of production. Thus attention to financial transactions and their impact on production should prove rewarding in the analysis of some of the crucial problems of today. Parallel concerns can be cited at the government level with respect to budgetary deficits, interest payments, inflation or deflation and foreign reserve changes.

1.9. The evident success of the SNA in the analysis of production and its widespread acceptance in economic analysis and use in policy development in itself creates pressure to examine existing practices and move toward a system more integrated with respect to production and finance. Toward this end, three papers were presented on the restructuring of the SNA at the nineteenth general conference of the IARIW in 1985.² In this paper, the author recognizes the contribution made by the international papers, but feels that a view from a Canadian background, where a majority of SNA subsystems articulating production and financial transactions are already in place, might also be of value. It supports the Dutch view that there are two basic approaches which are relevant for structuring the system and with their conclusion that in the 1968 SNA the two approaches have been implicitly forced into a standard mould with serious effects on the structure of the system, the production boundary and the ease of using the data.

1.10. The author believes that a number of problems which exist in the current SNA system can be resolved by recognizing that these arise from two basic approaches to measures of the contribution of capital. In order to integrate financial with quantitative aspects of production, the institutional-type current

²These papers, which were subsequently published in *Review of Income and Wealth*, Series 32, June 1986 as a special issue on the review of the United Nations System of National Accounts, are: Bochove, C. A. van and Tuinen, H. K. van, Flexibility in the Next SNA: the Case for an Institutional Core; Lutzel H., Market Transactions in the National Accounts; and Vanoli André, The General Structure of the System of National Accounts on the Basis of Experience Obtained with the French Enlarged National Accounting System.

value accounts tied to actual market events and business practices should be used as the benchmark framework for aggregate measure of production. Adjustments can then be made to certain items in order to meet the requirements generated in the special design of the value added accounts. The rationale for this contention is that institutional accounts correspond closely to the structure and operations of economic agents, whereas value added accounts are developed by economists with definitions and classifications designed to reflect particular quantity aspects of production.

1.11. In the second section in this paper, the author demonstrates the purpose and design of the subsystems, the third section contains the treatment of interest, the fourth valuation of inventory change and the IVA, the fifth depreciation and the last, the conclusion.

2. PURPOSE AND DESIGN OF THE SNA SUBSYSTEMS

2.1. Analytic purposes have played an important part in the design of the national accounting system and economic literature indicates that economists such as Ingvar Ohlsson and Richard Stone were fully aware of it. Ohlsson, for example, raises a fundamental question in this regard when he asks whether the same national accounts system is applicable for all the various purposes for which it is currently used or whether alternative systems should be created to serve different purposes. Stone's approach, utilized in the construction of the SNA, was to combine accounting entities and transactions so a relatively simple single system could be conveniently used. It now appears that the analytical requirements of production analysis and that of financial analysis, respectively, call for different treatment of the contribution of capital and thus the need for two categories of subaccounts.

2.2. Both of these approaches begin with the market transaction as an objective representation of economic production in national accounts measurement. Its importance can be deduced from the writings of Kuznets where it is designated as an elementary starting point for national accounts purposes. He defines aggregate national income as the net value of all economic goods produced by a nation in the form of commodities, services, arrangements, etc. that appear in the market place. The market transaction was used as a basis for determining the economic value of production since it has implicit attributes which enable the separation of economic goods from other goods. It is assumed that buying and selling imply that such goods are a source of satisfaction and are relatively scarce. A second reason for market transactions as logical basis for national income measurement of production is that economic value is fashioned in the marketplace in interactions between willing buyers and willing sellers dealing at arms length.

2.3. Parenthetically, it ought to be mentioned that there is, of course, some production which does not pass through normal market channels that is also considered economically productive. To have a comprehensive measure of economic production, therefore, both market and selected nonmarket production

are summed to arrive at the GDP aggregate. Currently, nonmarket entries include, among others, imputations for items such as farm produce consumed on the farms, net imputed rents on owner-occupied housing and imputed rents on government assets.

2.4. It is not being suggested that GDP, as the value of unduplicated economic production, should simply be a summary of market price transactions or that GDP components should adhere strictly to business account definitions since these are often influenced by tax and other regulations. There are a number of adjustments from one set of accounting principles to the other and the economic implications of these can be justified. The SNA approach to interest and valuation of inventory change and its difference from business accounts treatment, however, arises from the fact that the SNA attempts to meet only the requirements for production analysis without recognizing that financial analysis requires the approach to these items on the business accounts basis. In the income based approach, for example, the national accounts treatment of interest in the calculation of profits, initially corresponds to the practices followed in business accounts. That is, receipt of interest is treated as nonoperating revenue and the payment of interest as an intermediate cost of business. Similarly, in the calculation of profits and net income figures derived from business records there is no adjustment for holding gains based on value of physical change in inventories. However, other adjustments in the derivation of the GDP aggregate effectively nullify the effects of portraying these items on a business accounts basis.

2.5. In order for data on a financial basis to be valid, it must take into account economic behaviour in terms of corporate control, concentration of wealth and government economic policy. Financial analysis encompasses items such as the relationship of entrepreneurial returns (profits/net income) to invested equity capital, debt service costs to revenue, volume of debt to equity, rates of return on sales and overhead costs to total costs. Each series depends on data from institutional units, such as companies and enterprises, responsible for decisions on finance, marketing and investment. At an industry level such data are used by governments for gauging the financial health of an industry, the effects of public policies on taxation, grants and subsidies and decisions respecting financing, tariff and trade policy. On a financial basis interest paid is treated as an intermediate cost to the borrower of funds and interest received is treated as income to the lender. In addition to other earned income it becomes an implicit component of profits. Therefore, income originating in an industry or gross domestic product of an economy, is represented by the sum of its labour costs, depreciation, net indirect taxes, and profits, after adjustment for nonresident factor income.

2.6. In contradistinction to financial analysis, the current treatment of interest and IVA are based on production analysis concepts. For example, theoretically, productivity is considered in terms of changes in man hours of labour and units of capital use in relation to changes in physical output. In actual fact the determination of capital use is difficult since there is no standard unit for

measuring such capital. In the absence of meaningful value or physical data, use is made of "real" value or constant price information. These are obtained by abstracting price changes by deflation which converts current value data to a common price base.

The ratio of capital use to labour is important in comparing productivity or efficiency between one industry and another or, in the same industry, from one period to another. In such studies of relative factor use and productivity, it is the input of physical capital or capital stock that is considered significant and the distinction as to whether funds used to finance this capital are owned or borrowed are considered as irrelevant. For such analyses, therefore, the contribution of capital use is represented by the cost of capital, i.e. operating profit and paid interest combined, as a proxy for capital input. For the specific purpose of productivity calculations where the ownership of financial capital is considered irrelevant, it is logical to include interest payments in the value added of the paying industry.

2.7. In determining relative costs, between capital stock and labour use, it is important that prices of inputs be on a consistent basis. For such comparisons having some prices at historical cost and other at current prices means that changes in mix between historical and current cost of inputs would influence productivity calculations. For this reason consistency requires that nonoperating gains generated from the holding of inventory stocks, which are normally included in business calculation of profits, are eliminated by use of the IVA. It also requires that depreciation, representing the usage of capital stock in present production, be taken at current replacement cost. Again, in order to get valid productivity comparisons only surplus generated from current operating production is taken into such accounts. This is one reason why interest received is not included with operating income of the recipient; the second is that this interest is already accounted for and included in the factor costs of the paying industry.

2.8. The need to have interest, depreciation and inventory change on a basis suitable for growth and productivity analysis created a dilemma for the early national accountants. This controversy is reported in the literature of the period. In the discussions of the 1937 NBER Conference on Research on National Income and Wealth, Kuznets justified the national accounts departure from practices followed in business accounting on the grounds of consistency. He argued that the national income estimator attempts to measure what net income actually is, rather than what people think their net incomes are. This contention in the case of inventory change and IVA was challenged by M. A. Copeland who referred to the IVA adjustment as "partial deflation" and by Arthur Marget, who argued that the gain or loss represented by IVA is a part of profits. What now provides the basis for reopening some of these issues, is the development of the financial side of the Accounts, which clearly reveals that Kuznets' point about consistency was limited to calculations in real terms respecting productivity, cyclical movements and growth. It ought to be reconsidered in the proposed revision of the SNA. A more detailed exposition of the implications of these earlier decisions is presented below.

3. TREATMENT OF INTEREST REEXAMINED³

3.1. The United Nations SNA adheres to the concept of interest as a factor return to capital to be included, like labour income, in the value added of the paying industry. This treatment, however, generates a number of anomalies, such as the emergence of negative income originating in the financial industries. The existence of these anomalies has given rise to a number of rationalizations which, when taken in toto, appear to be inconsistent.

3.2. A number of writers have criticized the current treatment of interest and have proposed alternative ways of dealing with it in the national accounts.⁴ One alternative proposed is that interest paid should be viewed as a "commodity-type" service payment for the use of financial capital. Financial capital in the form of money provides the wherewithal to the entrepreneur to acquire and direct resources in the form of labour, materials and capital stock to carry out transformation and trade aspects of production. Borrowing at interest is a form of leasing of capital which contributes directly to gross output from which interest, the cost of using borrowed funds must be accounted for to arrive at value added. The SNA categorically treats this interest payment as a factor cost. The question that this raises, however, is on what basis have returns to capital use been distinguished from factor and intermediate costs and how do these relate to equity, loan and tangible capital.

Distinction between factor and intermediate costs in national accounts concepts can be inferred from the treatment of labour income and profits. Both are recognized as returns to factors of production. What is common to both, the wage and salary return to labour and the profit-net income return to equity capital, is that both of these are residual claimants on production, i.e. no further expenses are charged. In the case of labour, all costs incurred in its production such as food, shelter, etc. are treated not as intermediate expenses, but as final consumption. Similarly, any distribution of net profits in the form of direct taxes, dividends, donations, etc. are treated as transfers and not as intermediate expenses.

In the real world, a lender has expenses associated with lending that must be recovered from interest revenue; the most obvious being operating expenses and deposit interest payments in the case of financial intermediaries. This is why treating interest in the national accounts as a nonoperating transfer receipt

³For an earlier discussion of this issue see: Sunga, P. S., *An Alternative to the Current Treatment of Interest as Transfer in the United Nations and Canadian Systems of National Accounts*, *Review of Income and Wealth*, 30 (4), 385-402, 1984.

⁴At the 20th IARIW General Conference, one participant suggested informally that another possible approach to interest in the national accounts would be to treat it in a way similar to that of indirect taxes, that is, as a component of market value, but neither as a factor cost nor as an intermediate expense. This novel approach raises issues regarding the appropriateness of the current treatment of indirect taxes and whether the characteristics of interest and of indirect taxes, respectively, are sufficiently similar to justify an argument by analogy.

The controversy about the treatment of indirect taxes is well documented in the literature and the complex issues are beyond the scope of this paper. With respect to the second aspect it can be seen from the inherent characteristics of the two items that there is little similarity between the two cases. For example, indirect taxes consist of a number of components some of which are flat fees, some are related to quantity or to value of purchase, some are levied to raise general revenues and others, simply to discourage consumption. Interest, on the other hand, is associated with the lending and borrowing of money, with the amount paid directly related to amounts borrowed and to price established in a competitive market.

and as a factor payment with no charges allowed for operating and deposit interest expenses causes negative value added and the need for an imputation to occur.

Part of the confusion with respect to the treatment of interest arises from the fact that the term interest is not generally qualified. It is used generically to refer both to the gross interest charge such as that paid on bank loans and to the net portion after various expenses have been deducted. Apart from the packaging and pooling of funds, transformation of maturities and risk involved in lending, there are also expenses in granting and servicing the loan all of which need to be recovered through interest. The latter include those associated with qualifying borrowers, processing applications, appraisals of collateral, preparing legal documents, recording interest payments and possible legal action in case of default. The difference between gross and net interest, therefore, is not unlike that between gross and net rents where various expenses such as insurance, property taxes, repairs, etc., have to be covered. It is argued that the gross charges in the case of both rents and interest represent service charges and the nets after expenses are forms of factor returns analogous to net income or net profit. The confusion between gross and net interest may arise from the fact that in many situations there are no charges against gross interest and, therefore, it may be identical with the net. The two figures may be perceived as one when in fact, they are actually two. Thus consumer debt interest paid by persons is a service charge to the consumer and a service revenue to the finance company. But after the finance firm's expenses of administering the load are deducted, the net interest becomes part of its net profits. On the other hand, bond interest received by persons can appear both as gross and net income at the same time if there are no administrative expenses involved and the funds used for the bond purchases come from savings.

3.3. The term capital is used in a number of senses in the SNA. In a physical sense it refers to tangible assets such as buildings, machinery and equipment. In business accounts, use of these assets is reflected explicitly by the allowance for depreciation and obsolescence. In fact, however, depreciation estimates are determined by tax regulations and accounting conventions and therefore may not realistically represent the specific contribution of these assets to production. This contribution in effect becomes a part of the residual profits figure, a package entrepreneurial return.

Production also requires financial capital either in the form of equity or as loans. Equity capital is portrayed by net worth in the balance sheet and represents entrepreneurial funds at residual risk and benefit. In accounting terms, net worth can also be derived as the difference between total assets and total liabilities. The equity contribution to production is measured by profit or net income figures. Finally, there is loan capital in the form of bonds, mortgages, demand loans, etc. which appears on the balance sheets as liabilities of the borrower and as assets of the lender. The contribution of loan capital to production and its disposition is represented by interest which shows up as revenues of the lender, as intermediate expenses of business and as final consumption purchases of persons and government.

3.4. If the alternative approach to interest as a commodity service were to be adopted by the CSNA, then the treatment of interest transactions of Government and of Persons and Unincorporated Business sectors, respectively, in the Income and Expenditure based subsystems would warrant special mention. Unlike business, where interest is an intermediate cost in the calculation of profits, in the other two sectors interest would be treated as a payment for service for final consumption. In nonbusiness sectors there are no intermediate transactions and all arms length sales of goods and services are defined as economic production and hence included in GDP.

Normally a considerable number of goods and service transactions take place between governments and their agencies, between different levels of governments and between governments and persons. Unqualified addition of all such transactions would distort GDP as a measure of unduplicated production since these transactions would be counted as final expenditures of the nonbusiness purchasers and as government expenditure on goods and services through inputs involved in their production. Such a result is circumvented by offsetting revenues of sales by governments against their final expenditures on goods and services.

Interest as a service would, of course, be subject to the same treatment. Thus, interest revenues of governments and their agencies (excluding government business enterprises) would be offset against their interest payments embedded in final government expenditure on goods and services.

The proposed treatment of government interest is opposite to that presently followed in the CSNA. It is presently reported as non-productive. Although interest on government bonds, etc. is recorded in the income side of the Accounts as investment income of government agencies and funds, as interest receipts of individuals and as part of corporate business profits, it is excluded from the measurement of production by an overall deduction representing total interest paid on the public debt. Thus, in the current CSNA a complete offset between government interest revenues and government interest costs occurs on the income side of the Accounts. In the proposed treatment all government interest intersector transactions would be included in production. There would be no general government intrasector interest entries on the Income side of the accounts. The intragovernment interest flows would be offset on the expenditure side of the Accounts, i.e. interest receipts as sales revenue, against government expenditures on goods and services.

The procedure for the offset treatment of interest in the government sector is not necessary for the personal sector. Persons lend money to other persons for mortgages or for general business operations. These are business loans whose interest cost is offset in calculating net rents or net income. Unless persons are in the business of lending, in which case they can be considered as de facto unincorporated business, persons do not normally borrow at low rates to lend at higher rates. Therefore, a situation similar to that prevailing in government does not arise.

3.5. In regard to the balance sheet, its structure consists of sector assets, liabilities and net worth. This indicates the degree and types of financing underlying production and consumption and the net wealth position of sectors and industries.

The interest flows indicate the degree to which producers and consumers rely on the use of outside savings for financing.

Treating interest as a service articulates the links between income and expenditure, financial flows and balance sheets subsystems since these accounts provide data on financial arrangements, mix of financial instruments, institutional structure and flows of funds. From the point of view of institutional analysis, availability of money, interest rates, monthly payments and repayment conditions have an important bearing on investment decisions. The alternative treatment of interest, as service cost of production and as return on financial capital, allows the entrepreneur to compare relative rates of return between investing in tangible assets and investing in financial capital.

3.6. Although inappropriate for financial or general analysis, nevertheless, the current SNA treatment of interest can be justified for quantitative measures of industry production and productivity. As part of compiling the value added by industry, the return to real capital is represented by operating surplus which is interpreted as operating profit before the deduction of payments for interest. The rationale for this treatment is that interest is part of the overall return to factor capital and therefore, like return to the factor labour, should be shown in the industry generating it. This makes sense analytically in deriving quantity of production where the objective is to measure volume changes irrespective of where the financing of the capital occurs. For these calculations money is not recognized as part of capital since, it is argued, the output is not dependent on whether capital is financed by equity or borrowed capital. Therefore, both approaches to interest have their specific uses.

3.7. It should be noted, however, that the two treatments, interest as a factor and as an intermediate cost, respectively, yield different measures of aggregate GDP because of the interactions between the domestic and nonresident sectors. Where interest payment is treated as an intermediate cost, interest paid to nonresidents for borrowed money is a purchase of a service like any other import and therefore should not be included in either domestic or national production. Where interest is treated as a factor cost, such as for the calculation of productivity measures, interest paid can be treated as part of domestic production with recognition that the aggregate GDP obtained is for a special analytical use.

4. VALUATION OF INVENTORY CHANGE AND THE IVA

4.1. The second item which should be treated differently with respect to the derivation of GDP between the income-expenditure and value added subsystems arises from the valuations of inventory changes. The existing national accounts compilation does not incorporate data on profits/net income and book value change in inventories reported by business directly, but modifies these data by an inventory valuation adjustment (IVA) to eliminate what is perceived as elements of capital gain. This adjustment is needed because inventory is costed at value at acquisition rather than at replacement cost. The IVA modification, although useful for productivity type of analyses, distances the current price

national accounts series from actual business accounts practices, and distorts relationships with other series not so modified.

4.2. To explain the national accounts costing of inventories, it might be helpful to go back to an explanation given by Simon Kuznets in the first of National Bureau of Economic Research Conference Series in 1937. Prior to this, Keynes and earlier economists favored conventions used by taxation authorities to determine profits. Apparently Kuznets came across the IVA issue in the course of using the commodity flow approach to compile estimates of GNP, that is, deriving GNP as the sum of the value of final output less energy and materials consumed in that production. He concluded that the latter should be revalued to current costs instead of their accounting values at historical prices so that national income at current prices could be derived from consistent data.

Kuznets' method, which excludes gains and losses from the holding of commodities and relegates inventory changes to physical movement at fixed valuation, was used in the derivation of U.S. national accounts data, in compilations by Canada and the U.K. and has been recommended by the United Nations. Review of the literature indicates that in general, with the exception of initial objections by Copeland and Marget, noted earlier, Kuznets' approach to the treatment of the IVA in the national accounts has been followed with little discussion.

4.3. The following is a summary of the two positions—that given in support for and that in opposition to the inclusion of the IVA. The framers of the Canadian System of National Accounts, the U.S. and the United Nations, take the position that in periods of rising prices an element of capital gain is included in the estimation of profits due to the way business values its inventories. They believe this element should be excluded from the National Accounts estimates of production by use of the IVA.

The arguments for the use of the IVA in adjusting profits and using valuation of physical change (VPC) to replace the recording of book value changes in inventories are set forth in the CSNA reference document, as follows:

“ . . . production in the National Income and Expenditure Accounts is measured at the current market prices of the period in question. This means that net investment (or disinvestment) in inventories—represented by the change in inventories from one period to the next—should be valued at the average prices of the period in question. However, the principles of inventory valuation used in business accounting are usually quite different from those required for the Accounts. In periods of rising prices, changes in recorded business inventory book values will frequently include an element of capital gain which simply reflects the fact that beginning-of-period inventories and withdrawals have been recorded at original cost, while purchases and end-of-period inventories are recorded at a higher price. In other words, the recorded money value of the “book change” in inventories will have increased by more than the physical change in inventories valued at current (or replacement cost) prices.

In these circumstances, corporation profits and net incomes of non-farm unincorporated businesses included in National Income will contain an element of capital gain (stock appreciation) which is not related to the measurement of current production, and which is not consistent with the way in which other flows and transactions in the National Accounts system are valued. The inventory valuation adjustment is thus designed to remove from the National Income any such capital gains (or losses) resulting from the inventory accounting procedures of business firms where no distinction is made for profits arising from the turnover of goods at higher prices.”⁵

Two Australians, A. R. Hall and Bryan Haig, have long maintained that the consequence of the deduction of the inventory valuation adjustment in current price national accounts is a serious shortcoming since it leads to mistiming of changes in production and to an understatement of the level of profits.⁶ They both question Kuznets’ method. Haig argues that conceptually the main problem with Kuznets’ approach is with respect to its effect on the treatment of profits. By revaluing costs of labour and material embodied in inventories consumed from historical to current market prices and deducting this increase in costs from current profits, the IVA adjustment in effect implies that profits as calculated are overstated. There is no reason to assume that profits as estimated are overstated unless it is suspected that they include an element of capital gain. This position is challenged next.

4.4. A shortcoming of the contention that holding gains are capital gains is that it does not differentiate between inventories and capital formation. It does not recognize that holding gains, as represented by the IVA, might be current production in the form of operating profits earned from normal risk entailed in carrying inventories. Although undisposed production, left as inventories, is not part of current consumption, it is also not a part of capital formation.

Though there appears to be much controversy among economists on the precise meaning of capital, the national accounts treatment of capital formation and depreciation imply that capital stock is that which is bought or put in place for producing other goods and services for the market. Capital stock is not used up in the process of production in the same sense that materials and energy are transformed into new products, but it is subject to wear, tear and obsolescence for which an allowance is made through depreciation. On this basis depreciation expense is a part of and included in current production, but capital gains or losses from the resale of capital stock itself are not.

The acquisition or creation of a capital asset is motivated not by a desire to resell or trade the asset, but for use in producing other goods and services for the market. In this situation, capital assets are not a part of the normal trading

⁵Statistics Canada, *National Income and Expenditure Accounts*, Vol. 3 (catalogue 13-549E occasional), Ottawa: Information Canada, 1975, page 75.

⁶Haig, B., *The Treatment of Stock Appreciation in the Measurement of National Income*, *Review of Income and Wealth*, 19 (4), 429-436, 1973. Hall, A. R., *Some National Income Accounting Anomalies: The Stock Valuation Adjustment and Government Expenditure at Constant Prices*, The Australian National University, Centre for Economic Policy Research, Discussion Paper No. 30, July 1981.

process classified as current production. Therefore any gains or loss in the disposition of capital assets is not included as being current production, either in the business or the national accounts.

4.5. Inventories, on the other hand, consist of production undisposed of as current final consumption or as capital. Inventories are that part of production acquired or held by business for the purpose of sale, for the purpose of further processing, or held in the expectation of cashing in on anticipated price increases. Value in form of time, space and convenience utility is added during the holding period for already produced goods by carrying out further processing, by building stock to provide adequate selection, by catering to consumer convenience through repackaging, or simply by carrying stock through the season from the time that the goods are produced to the time when market demand catches up. Holding of inventories is an important part of business operations. Profit or loss arising from such holding activities is a normal return to risk.⁷

4.6. If one accepts the basic notion that the Accounts measure production by recognizing actual costs, inventories when sold should be charged out at production or acquisition cost plus carrying and processing charges, not at market replacement value. From this perspective it might be stressed that in the national accounts, as in business, profit is measured only when it is realized. Thus, although costs incurred in the purchasing and holding of inventories accrue over time, profit or loss is realized only when the actual sales transactions take place.

4.7. The contention that profits represented by the IVA do not belong in the measurement of current production can only be justified in terms of productivity determination. Productivity comparisons require the measurement of all inputs at standardized costs. If conventionally determined profits were to be used in this calculation, the difference arising from what the inventories consumed would cost currently and what they had actually cost would residually end up as part of nonlabour factor productivity, i.e. of capital. Under the current approach this increment does not materialize and this is the only basis by which additions to physical change rather than book value changes can be justified. In other words, increases in inventories due to price change do not end up as productivity gains.

4.8. An argument used by economic analysts in support of the IVA adjustment and revaluation of inventories at replacement cost (or some variance of it) is that profits calculated using the historical cost of inventories are unrealistically high since inventories sold must be replaced at higher prices. In such circumstances, taxes and dividends based on these profit figures could erode and jeopardize the viability of business operations. This argument is based on the premise of capital maintenance in the face of rising nominal income due to inflation.⁸ However,

⁷For more discussion of this topic, see paper by Jack Hibbert, OECD, Profits and Inflation Accounting (Note by the Secretariat), DES/NI/81.2, Paris, April 1981.

⁸For example, Stuart C. Gilson states, "In terms of the capital maintenance definition of income, this difference (referring to the IVA as illusory capital gain) should be excluded from the taxable income base, because it represents an expense that must be incurred if the real stock of inventories is to be replenished." (Words in parentheses mine.) Gilson, S. C., The Inflation-Adjusted Rate of Return on Corporate Debt and Equity: 1966-1980, Bank of Canada Technical Report, April 1984.

for the historical record and for consistency within the accounting system, national accounts need to record basic market transactions in the context of existing environment of prices, government legislation, etc. If basic data are processed or adjusted according to special considerations such as income maintenance or to allow a particular type of analysis, such modified series should not be mixed with actual transaction data.

4.9. As noted half a century ago by Marget, IVA can be considered as a partial inflation adjustment to profits. As an inflation-type of adjustment, the IVA should not be made in the current dollar income and expenditure accounts even though it may be necessary in the analytic production accounts. The current accounts are designed to show transactions at current market prices irrespective of price changes and adjusting some items and not others for inflation introduces an inconsistency into the whole national accounting system.

5. DEPRECIATION

5.1. The appropriateness of historical versus replacement cost depreciation also warrants some discussion in the context of income-expenditure versus value added measures for production data. In general, for macroeconomic purposes there are two basic ways of charging depreciation allowance for the wear and tear of capital in the process of current production. Of these the first is depreciation at acquisition cost in which the base value of capital stock is taken at acquisition prices paid for the items being depreciated. The second is to revalue the items being depreciated to replacement cost, that is, what it would cost currently to replace similar items with those considered to have similar potential earnings yield. Replacement cost calculations are subject to wide variation depending on the way subjective factors such as the determination of identical equipment or equipment which performs similar functions or selection of interest rates to capitalize earning potential are considered.

5.2. Acquisition cost accounting is said to have a number of drawbacks, such as aggregating money values of noncomparable purchasing power, and in inflationary times, arriving at allowances from current income which may be considered inadequate in terms of capital maintenance. Nevertheless, it does have the advantage that historical cost figures are firm-determined and based on institutional constructs of the time. To satisfy the conflicting needs of analysts, an overall system of Accounts needs both types of depreciation series; on an acquisition basis in the Income Accounts for market transaction data which mesh with financial series for the financial analyst and on a replacement cost basis for analysis of growth and productivity. In any case the estimates of aggregate GDP and GNP remain unaffected irrespective of whether depreciation charges are taken at acquisition or at replacement cost.⁹ This is because whichever calculation is used, the difference is offset in profits and it is the sum of depreciation and profits which enters these aggregates.

⁹Although not a problem in the determination of GDP, the selection of historical versus replacement cost depreciation is of critical importance in studies of comparative returns to labour and capital as shares of national income at factor cost or of net national product.

The current business practice of using acquisition cost is determined by income tax regulations. If, however, these were to change to allow depreciation to be charged on a different basis and hence result in different profit figures, then that convention would have to be followed as an accepted economic reality.

CONCLUSION

6.1. In this paper the author contends that the present conceptual framework of the SNA is tailored to the analysis of production primarily from the vantage point of volume (expressed as value at constant prices). To attain this, some concepts have been modified so that the production boundary on a volume basis is no longer congruent with a production boundary developed on a market price basis.

6.2. The success of the SNA system in the analysis of production has encouraged the extension of the system to include the financial aspects of the macroeconomic system. This has involved questioning the differences in the treatment of interest, IVA, depreciation and certain valuation items between the national and business accounting systems. This paper reexamines the conceptual structure of the SNA to determine some of the changes needed to accommodate the extended scope of emerging demands.

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