

REFLECTIONS ON NATIONAL ACCOUNTING

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This article consists of a description and critical analysis of two important works on national accounting which have appeared fairly recently—see footnotes 1 and 2. There are fundamental differences between the systems of accounts proposed in these two works, the author tending to prefer the Ruggles system. While full of admiration for the thoroughness and other qualities of the new SNA, the author finds the system it proposes over-elaborate as a programme for national statistical offices. In his view decision as to which is the “best” system is still wide open, despite the acceptance of the new SNA by the UN Statistical Commission. In the article there is bare mention of a new (1972) book *Economic Accounts and Their Uses* by J. W. Kendrick which the author has since read. All three works help in determining the best practical system of accounts. It is hoped that this article (in its small way) will also make a contribution.

The subject of national accounts at constant prices is not dealt with at all in any of the three works despite the fact that it has received considerable attention at various meetings of IARIW. Accounts at constant prices and their concomitant price indexes are more important in these days of the curse of inflation than are accounts at current prices. Of course the new SNA deals with items at constant prices but the author finds the treatment rather inadequate.

It is satisfactory that the new SNA provides for input-output but the author agrees with the Ruggles view that the textual treatment in SNA is somewhat incomplete.

The article gives the author's views on many other topics relevant to national accounting (which encompass all economic statistics!) including price index number making, inaccuracies in data, delays in availability of so-called “current” statistics, and treatment of financial intermediaries.

Two important works^{1,2} published fairly recently are essential reading for national income accountants (and all economists these days answer this description in some degree). It may be stated at once that these books (we often call them for short, “the new SNA” and “RR”), taken together, reveal an intriguing situation.

The new SNA was developed by an Expert Group convened by the UN Secretary-General under the chairmanship of Richard Stone, the father-figure of national accounting, who practically single-handed was responsible for the former SNA, i.e. the system which the new work supersedes.³ And what a supersession! The new SNA is a massive work of 246 large pages—compared with old SNA's 45—in nine explanatory chapters. It has been adopted by the UN Statistical Commission for the use of national statistical authorities and for reporting by international statistical agencies.

The distinction of the authors in the national accounting field would be recommendation enough for RR. There appears to be more to it than this.

¹*A System of National Accounts*. Statistical Office of the United Nations. Studies in Methods, Series F. No. 2, Rev. 3, United Nations, New York, 1968.

²Nancy and Richard Ruggles, *The Design of Economic Accounts*, National Bureau of Economic Research, Columbia University Press, New York, and London 1970.

³RR remarks that though work in national accounting in U.S. and U.K. is best known, pioneering work was also carried out in Norway and the Netherlands, instancing a 1940 study entitled *National Accounting (National Regnskapet)*, Oslo, 1940, by Ragnar Frisch.

In their Preface the authors state that “the immediate impetus for this study was the proposed revision of the United Nations System of National Accounts.” The point is that the involvement of the U.S. National Bureau of Economic Research (NBER) goes far beyond that merely of publisher. It is stated that many people in NBER “contributed to this work”. Two staff reading committees reviewed earlier drafts. The usual form of disclaimer “responsibility for contents is the authors’ alone” is conspicuous by its absence. One is entitled to infer that the Ruggles’ criticism of the new SNA and their own proposals for revision, ostensibly of the US system, have the full approval of NBER, the oldest and most illustrious national institute engaged in these studies.⁴

The status of the Ruggles’ proposals requires consideration. Are they designed to rival those of SNA? Were these proposals brought to the notice of the UN Expert Group? As indicated above, the “immediate impetus” of the book was the SNA revision. It is inconceivable that the Expert Group would have failed to consult NBER.⁵ A large part of the Ruggles book is devoted to a full and fair description of the new SNA, with emphasis on economic aspects, as distinct from the writer’s in what follows which bear more on statistical and methodological aspects.

Interest attaches to the explicit criticisms of the new SNA, amongst them the following:

(i) In order to integrate a number of different forms into a single system SNA gives somewhat less attention (than it should?) to the major intersectoral relationships.

(ii) Though the new SNA provides for input-output (IO) and flow of funds it does so only in the supporting tables and not as part of the system of accounts. Treatment of IO is incomplete.

(iii) While segregation of private non-profit institutions serving households in the new SNA is better than integration with households as in the old, doing so “makes too much” of this small sector; best solution would be to merge it with the enterprise sector it most resembles.

(iv) The new SNA does not serve the purpose of showing the major flows of the economic system among the different economic sectors as well as did the old. The new consolidated accounts, i.e. the Class I accounts, are such that the economic activity of government and households is not separately presented.

(v) Deconsolidation of accounts in terms of commodities, industries, households etc. contain the necessary intersectoral information but at the cost of introducing a great deal of unnecessary detail.

This is a fairly formidable indictment on which this commentator, once a producer but now only a consumer of national accounts, does not feel bound to sit in judgment, especially, as will presently be seen, as he has own axes to grind.

⁴Unfortunately for the writer’s skill at detection he is authoritatively informed that “publication by NBER does not necessarily mean ‘endorsement’ of the views of the author by the Bureau’s Board of Directors, and certainly not by other staff members”. The writer suggests that in future publications of NBER responsibility be made more clear.

⁵It did not consult a former chief of the national accounts branch of the UN Statistical Office (UNSO) who feels no grievance therefor!

The implicit criticism of the authors is of greater moment, namely in their propounding a set of national income accounts which differ fundamentally from those of the new SNA. It is true that the RR proposals are stated to be designed only for U.S.—they are rather similar in form to the existing U.S. presentation and are illustrated by U.S. figures for 1966—but surely, at the macro level anyway, all free economies should have the same form of accounts? Countries are confronted authoritatively by different sets of proposals. Which do they choose?

In what follows the writer shall not presume to make a choice between such formidable groups of authorities, still less to propound his own system. He makes the point that the issue is still open. He will be well content if his remarks help towards wise decision.

It is clearly a situation in which the philosophy underlying national income accounting requires looking at, so we start with some elementary considerations. The difficult task is also tackled of giving some idea of the contents of these highly concentrated works, an object perhaps worthy in itself in view of the importance of the works, but essential to make criticism meaningful to readers who have not studied them. Finally the writer will refer to some aspects of national accounting which are (in his view) either too summarily dealt with, or dealt with not at all in either of these books.

USES OF NATIONAL INCOME ACCOUNTING

The new SNA, as a third edition, naturally takes the utility of national accounting for granted, except as regards the considerable extensions with which we deal in due course. In the second edition of SNA⁶ (the “old SNA”, that of July, 1953) we read:

“The production, distribution and use of goods involves many complex processes and to understand these processes better an increasing amount of information is being gathered all over the world. All this information belongs to the realm of economic statistics. One group of investigators has been concerned mainly with the concept and measurement of national income and product and their development into a system of national accounts.”

“While national accounting information is useful in all fields of economic decision-making because of the factual background which it provides, its outstanding use has been in connection with public policy . . .”

“In formulating economic policy it is usually necessary to assess the probable situation as it would materialise if no additional policy measure were taken and to formulate measures which are needed to bring the situation nearer to a desired goal.”

RR puts it this way:

“National economic accounting has as its prime objective the creation of an information framework suitable for analyzing the operation of the economic

⁶Studies in Methods, Series F, No. 2, Rev. 2. *A System of National Accounts and Supporting Tables*. United Nations, New York, 1964.

system. A modern economic system operates on the basis of a network of transactions . . . ”

National accounting derives from the ideas of professional accountancy. It seemed obvious to its initiators that what is useful for the particular concern must be useful for the national economy. At the global level the accounts identify and exactly define the macros of the economic system. The so familiar GNP itself was introduced into economic thought through national accounting. The balancing property of the accounts draws attention to statistical lacunae and inaccuracies. The balancing and double-entry properties go far towards insuring that our macro-estimates for forecasting and planning are consistent.

The new SNA is more than an essential work of reference for national accountants and government statistical offices. It is a liberal education in modern descriptive economics, the institutions of the state and their economic relationships. One admires particularly the meticulous thoroughness of definition. The entities here displayed may not always be what economic theory requires—are they ever?—but such as they are (and when the figures are available) one can be confident that one will know exactly what one is talking (or thinking) about, a great point gained in economic disputation.

A SIMPLE SYSTEM

Many of the ideas in national accounting become clear on considering the following highly consolidated system of five accounts set in the form of algebraic identities:

- | | |
|------------------------|---------------------|
| 1. Product account: | $P + M = C + I + E$ |
| 2. Income account: | $Y = P$ |
| 3. External account: | $E = N + M$ |
| 4. Consumers' account: | $C + S = Y$ |
| 5. Capital account: | $I + N = S$ |

The symbolism requires little explanation: consumption C includes government as well as households so that transfers and taxation are consolidated out; I is investment; E and M are exports and imports (visible and invisible), so that N is foreign investment; S is saving. Product P , income Y , and saving S are gross or net according as I is gross or net, i.e., net of capital consumption. The system is articulated, each of the eight symbols appearing twice, on different sides of the accounting identities. Deconsolidation would involve the creation of new accounts, e.g., general government, and the introduction of new symbols including taxation, subsidies, consumption expenditure.

On account of the property of articulation any one of these five relations is redundant: it can be derived from the other four. Suppose, in general, that there are p ($= 5$ above) identities and n ($= 8$ above) variables. We have $(p - 1)$ independent relations which means that any $(n - p + 1)$ variables can be assigned arbitrary values and the remaining $(p - 1)$ determined in terms of these. When n is small it is remarkable how far one can go in realising consistency in forecasting

from this simple property alone.⁷ In general these identities either form part of an input-output system or are added to a set of behaviouristic equations for solution.

As we shall see, the new SNA uses a matrix approach to the setting up of its accounting model. This has the immense advantage of halving the number of entries in the system, i.e. in the matrix each variable appears only once whereas in the equation system it appears twice, as we have seen. Applied to the foregoing system the matrix is as follows:

	1	2	3	4	5
1. Product	—	P	M		
2. Income		—		Y	
3. External	E	T	—		
4. Consumer	C			—	S
5. Capital	I		N		—

The identities merely state that the sums of each row and corresponding column are equal, as in the interindustry part of the input-output table. The entry T at position (3, 2) has to do with accounts at constant prices dealt with later. At current prices, as at present, $T = 0$.

To make what follows reasonably comprehensible we must have clear ideas about *sectors* and *types of account*. A sector is a group of *transactors* more or less homogenous as regards functional or behaviouristic characteristics, in whatever detail is found useful. At the macro level sectors are usually (i) enterprises, (ii) households, (iii) government, and (iv) rest of world. Type of account is illustrated above by the five accounts in the previous paragraph, also at macro level. Clearly one can envisage a set of accounts for each sector of the economy, however detailed the sectorization is.

DEVELOPMENT AND STRUCTURE OF THE NEW SNA

In the old SNA there were six balancing accounts. Three of these (household, government, external) were divided into two parts, (i) current, and (ii) capital reconciliation, the link between (i) and (ii) being saving. As far as the writer can recall, no country was able to report in this form; rather, all capital reconciliation was consolidated with Account 3—domestic capital formation.

In the new SNA we are led by the gentlest steps into the heart of the Mystery, the method, commendably, being by numerical example. We learn that (in intentionally simplified form) there are to be four balancing accounts of the nation:

- a Production (Domestic Product Account)
- b Consumption (Income and Outlay Account)
- c Accumulation (Capital Transactions Account)
- d The rest of the world (Balance of Payments Account).

⁷As an illustration see R. C. Geary, "Towards an Input-Output Decision Model for Ireland." *Statistical and Social Enquiry Society of Ireland*, 1964.

The categories merely indicate the underlying principles of accounting. Turning to Annexes 8.1 and 8.2 showing the actual proposals we find extensive elaboration. The accounts are in three divisions: I Consolidated accounts of the nation, II Production, consumption expenditure and capital formation accounts, and III Income and outlay and capital finance accounts. Reassuringly, series I consists of the four above accounts (i.e. a, b, c, d), only with many more items. These accounts are now numbered 1, 3, 5, 6; the other transactors' accounts being 2 Consumption expenditure account, and 4 Capital formation account.

We are shown (Table 8.3) by a long series of identities how accounts II and III (separately) consolidate to accounts I. The principle of double-entry has become a complicated affair; it is no longer a matter of an item on the debit side being identical with an item elsewhere on the credit side but rather that this property holds for *sums* of items. If each of these sums were itemised formal articulation would obtain at the price, however, of needless detail in the accounts.

Each of the items in the account has a numerical code, usually of three digits (and in a few cases four), the system being simple and ingenious. The first digit relates to the transactors' account of which, as we have seen, there are six, so that the first digit is one of the series 1–6. The second number of the code, also one-digit (1–9) identifies a class of transactions, e.g. 2 is Disposition of goods and services, 4 is Distributed factor income so that 4.0 is our old friend, National Income. For instance in account I–5 (capital finance) we find the flow numbered 5.7.5. (= 6.7.5, the first digit indicating that it is also to be found in account I–6: external transactions), the last two digits (7.5) meaning “Purchases of intangible assets N.E.C. from the rest of the world”.

To summarise, there are to be 6 accounts (first digit) and it turns out that there are 124 categories of transactions (second and subsequent digits). Even though certain of these flows have to be broken down into industrial groups for accounts II, the fact remains that the number of flows is small and these flows march like a stage army again and again through the accounting system. One's view of the system depends on the view one takes of the economic importance of the individual flows. Clearly many of these flows are fundamental for analysis. The 26 Supporting Tables will supply a vast amount of additional information from which the analyst may find, or may be able to derive, what he wants. Inevitably, not always: one of the writer's favourite statistics is changes in stock of imports, classified by commodity, to mitigate the vast fluctuations (quarter-to-quarter or year-to-year) in total imports, perhaps the main source of error in behaviouristic equations, especially in Ireland where imports are so large. He hopes he is wrong, but he cannot find or derive these statistics from the Supporting Tables.

TABLE 2.1

Always using illustrative data the report leads us, via square matrices of dimensions 7×7 and 16×16 with increasing detail to Table 2.1 which is a 88×88 matrix described as “an illustration of the complete system.” As complexity increases, so does approach to reality, especially in the display of gross, in preference to net, values. Statisticians dislike net figures by themselves. For what follows in this section it is assumed that the reader has this table before

him. It is reproduced in RR. The writer has spent fascinated hours studying it and he recommends readers to do likewise. Only after study does its essential simplicity emerge. After a while the reader will be able to “put a name on” some individual figures, e.g. the 14 at position (8, 14) which turns out to be input of “other commodities” into the industry group manufacturing and construction. Indicative of the importance which the compilers attach to this table, a full key is given to the submatrices between the row and column lines, 28×28 (including zero matrices). Thus we find the square 5×5 submatrix at the intersection of rows 75–79 and columns 51–51 in the key as “The saving of institutional sectors”. It is true that by far the greater part of the matrix is blank, i.e. entries are not conceivable—of $784 (= 28 \times 28)$ possible submatrices, there are only 83 non-zero. Nevertheless, as a logical *exposé* of the flows of the economic system the presentation is a marvel of succinctness.

In Table 2.1 the sum of each row equals the sum of the corresponding column, which means that 88 self-balancing accounts could be produced from the table. Some of these would not be meaningful or useful, so instead the compilers combine *sets* of consecutive rows with corresponding columns to produce the many accounts in the text of Chapter 2. As we might expect, rows and columns relating to production, consumption, accumulation and the rest of the world provide the four consolidated accounts of the nation (i.e. accounts I) given, with data, in Table 2.14. It must be confessed that the derivation of these accounts from the data in Table 2.1 is complicated.

The stub shows that, apart from assets (opening and closing) and revaluations, the main heads are like those of our simple illustration above, thus: production, consumption, accumulation (or capital formation), rest of the world. We draw particular attention to the fact that separate classifications are used (under “production”) for commodities and activities (often called “industries”, though here the term is used in a special sense). (We comment on this distinction later.) Also we notice the appearance of private non-profit institutions several times with miniscule entries, the subject of an RR complaint. We appreciate the need for introducing “institutional sectors,” especially in relation to finance. It is

OPENING AND CLOSING BALANCE SHEETS—ALL INSTITUTIONAL SECTORS

	Opening Assets	Acquisition of Assets	Revaluation of Assets	Closing Assets		Opening Liabilities	Issue of Liabilities	Revaluation of Liabilities	Closing Liabilities
Currency and deposits	275	12	—	287	Currency and deposits	296	14	—	310
Securities	457	3	—25	435	Securities	442	8	—26	424
Other financial assets	517	43	4	564	Other financial liabilities	479	37	3	519
Net tangible assets	661	28	42	731	Net worth	693	27	44	764
Total	1,910	86	21	2,017	Total	1,910	86	21	2,017

only at this level that the ownership of financial assets (or financial indebtedness) can be conceived.

While the proposals in the new SNA are not designed to extend to national balance sheets, in fact the compilers go a long distance in the present report in preparing the way.⁸ We can scarcely do better than reproduce Table 2.16, derived from aggregates of rows and columns 75–79 of Table 2.1 (see p. 227).

In greater detail, we learn that the opening currency and deposit accounts classified by institution were as follows:

CURRENCY AND DEPOSITS FOR INSTITUTIONAL SECTORS

	Assets	Liabilities
Non-financial enterprises	23	8
Financial enterprises	68	184
Government	12	103
Households	170	1
Private non-profit	2	0
Rest of world	52	31
	327	327

FINANCIAL AND NON-FINANCIAL STATISTICS

The present revision may be said to have started in the writer's time in UNSO. An outstanding feature of the new SNA is its fusion of (i) flow of funds accounts and (ii) non-financial accounts (i.e. ordinary economic accounts, typified by the old SNA). Flow of funds accounts, even on a quarterly basis, had been developed since the early 1950's in a few countries, notably in the U.S. and Canada. They owe their inception to Morris Copeland.⁹ One knows little about the uses to which these statistics, by themselves, were put; one suspects not many. This is surprising and disappointing since financial statistics, if not the mirror image of ordinary economic statistics, should, one would think, be utilisable, by themselves, for economic interpretation. Up to the present, financial statistics have been used only to explain themselves. One hopes that the new accounts will bring about a welcome change. Financial statistics have the inestimable advantage of being available much earlier after the termination of the period of reference than are the great majority of other economic statistics, and, within their definitional limitations, are more accurate. Delay in availability is the bugbear in the interpretation, and hence control, of the short-term economic trend. It is earnestly hoped that the new SNA will stimulate studies in the utilisation of financial statistics for short-term economic forecasting.

It is of great interest to the writer to compare the 'prentice efforts in UNSO in his day in the fusion of financial and non-financial statistics, mainly the work of a young Australian, K. Walker. One recalls that Walker's idea was to produce

⁸The proposals extend only to the "square" in Table 2.1 between rows (and columns) 5–81.

⁹M. A. Copeland, *A Study of Moneyflows in the United States*, National Bureau of Economic Research, New York, 1952.

four self-balancing accounts for each institutional sector:

	<i>Linking item</i>
1. Production account	
2. Appropriation account	Added value
3. Capital account	Saving
4. Financial account	Borrowing

The linking items are those which appear on the left side of the upper account and the right side of the lower account. Instead of added value, Walker, with the ideas of the time, would have had “operating surplus” instead, since employee compensation would be a production cost and surplus = trading profit. As a point of fundamental principle, the writer would include employee compensation in the appropriation account alongside dividends, to emphasise the essential community of the two items. He infers the new SNA is in agreement with this viewpoint. Walker’s institutional classification was somewhat more detailed than that of Table 2.1 but in principle the same, namely the level of decision, i.e., the level at which the holding of all financial assets is conceivable. Account 4 above relates to *changes* in assets and liabilities from which it would be but a step to Account 5, namely the actual value of these elements at a point of time. It is clear that Walker’s institutional thinking was close to that of the new SNA.

FINANCIAL INSTITUTIONS AND INTEREST

A kind of *mystique* always surrounded the role of banking in national accounting which, fortunately for him, never troubled the writer, for whom financial institutions were industries like any other. The writer recalls discussions of almost Aristotelian depth with W. Gardner and E. Hicks of IMF on the nature of interest. The writer, as he says, had no conceptual trouble: interest rate was the price for the service of money or its equivalent. The trouble was not the difficulty that statistics of true banking profits were hard to come by (a statistical absurdity now in process of resolution) but rather that formal treatment would have resulted in the emergence of a negative operating surplus for banking etc. The old SNA idea was that added value in financial institutions would be calculated in the ordinary way, i.e. the way bankers themselves would calculate it. This added value was to be distributed as a cost (admittedly involving a problem of estimation but not more difficult than others in this field) amongst other institutional sectors (including households), identical sums being added to incomes of these institutions to preserve their savings figure intact. In effect, therefore, added value of financial institutions is added to other added value to give GNP. What of the new SNA?

As far as the writer can understand it, treatment in the report is changed considerably with the objects apparently of avoiding (i) the statistical difficulty mentioned in the last paragraph and (ii) making an undue addition to GNP in

respect of financial institutions. It is pointed out, in the first place, that gross output is actual charges for services which are only a small proportion of the income of banks etc. As before, a service charge is imputed equal to the difference between interest receivable and interest payable. This imputed service charge is treated as intermediate consumption of industries. It is stated that "The serious difficulty of allocating the imputed service charge among industries, general government services and households is avoided"—it is not stated why. Finally a nominal industry, to be classified as a financial institution, is created; its operating surplus, all its value added, is negative!

In this connection (and there may be others) it occurred to the writer that when changes were made in the basic concepts of the old SNA they might have been indicated, and justified. This might be a matter for study by UNSO.

INPUT-OUTPUT¹⁰

The title of Chapter III of the new SNA, namely "The System as a Basis for Input-Output Analysis", is significant, implying as it does emphasis on the system, i.e., Table 2.1, as distinct from the technique of IO as such. The chapter is, in fact, a paper of research quality dealing almost exclusively with the problem of product-mix: as a critical or methodological account of IO it is incomplete. One hopes that the implication is right that heads of official statistical offices are knowledgeable about, and convinced of, the essential usefulness of, IO. Certainly UNSO has propagated the technique in co-sponsoring an international conference ten years ago and in the publication of an excellent manual¹¹ on IO by our erstwhile ESRI colleague D. R. F. Simpson.¹²

In the exposition in Chapter III the numerical data continue to be used, the number of commodity and industry groups being increased from the four (of Table 2.1) to thirteen, to impart some reality to the inter-industry concept.

The main object of IO is to calculate the requirements, in output, imports, manpower, etc., direct and indirect together, for an increase in final demand of specified amounts. The principal difficulty of the technique is the reasonableness of the assumption of stability of the technical coefficients.

The approach of the new SNA is novel in that it explicitly recognises both industry and commodity classifications. Heretofore almost invariably the inter-industry part of the IO table envisaged industry selling to industry with the assumption in application of given unitary cost schedule $A = (a_{ij})$, a_{ij} being the value of the output of industry i in one value unit of industry j . We are well aware of the implausibility of this assumption especially when the IO table is of small dimensions, because of product-mix. In an appendix to its IO chapter the new SNA ruthlessly exposes the nature of the assumptions underlying our usage, on the following lines.

¹⁰This section is a summary of a longer treatment. Copies of the latter will be sent by the writer on request.

¹¹Problems in Input-Output Tables and Analysis, Studies in Methods, Series F, No. 14, United Nations, New York, 1966.

¹²Ca. 1960 the UN Statistical Commission was markedly cold and unresponsive about IO. One rejoices at their conversion.

The schematic IO arrangement used is:

	U	e	q
V			g
	y'		η
q'	g'	η	

The matrices and vectors (column and row) are as follows (with m = number of commodities, n = number of industries).¹³ Each row of **U** shows the intermediate input of commodities into industries, i.e. dimensionally $m \times n'$, **e**, the vector of final demand in commodities, is $m \times 1$, so the row sum vector **q** is also $m \times 1$. **V**, the output matrix, has industries for rows and commodities for columns, so it is $n \times m$; in practice it is near diagonal; also its rows sum to the elements of **g**; **y'** is the transpose vector of added value, deemed ascertainable only for industry. Hence columnwise **U** and **y'** add to **g'**. The reader may find it profitable (as the writer did) to identify in illustrative figures from the appendix matrix the matrices and vectors within the frame. The marginal vectors are derived therefrom.

If **i** denotes the vector all of units we have the following relationship:

$$\mathbf{q} = \mathbf{U}_i + \mathbf{e}; \quad \mathbf{q}' = \mathbf{V}' \mathbf{i}; \quad \mathbf{g} = \mathbf{V} \mathbf{i}$$

and, with capped (^) symbols indicating square diagonal matrices obtained from the vector elements, matrices **B**, **C**, **D** are derived as follows:

$$\mathbf{U} = \mathbf{B}\hat{\mathbf{g}}; \quad \mathbf{V}' = \mathbf{C}\hat{\mathbf{g}}; \quad \mathbf{V} = \mathbf{D}\hat{\mathbf{q}};$$

of these **B** is nearest to the familiar **A** matrix when the commodity classification is identical with the industrial classification, i.e. when **V** is exactly diagonal. **B**, **C** and **D** now become the system of constants, **B** stating that intermediate inputs of commodities are proportional to the industry outputs into which they enter, **C** that each industry makes commodities in its own fixed proportions, **D** that commodities come in their own fixed proportions from the various industries. Except for **B** these are drastic assumptions indeed, when one considers that the main object of the technique is forecasting, i.e. these constancies are deemed to apply in a future year of reference.

Clearly the stability of **B** is the usual (and most plausible) of the assumptions. One can conceive of **C** as stable only in the case of by-products (e.g. bran in wheat milling). The chapter nevertheless provides a very elaborate set of calculations (8 tables in fact) showing the effect on the technical coefficients of various sets of stabilities, including a mixture of hypotheses (about stability).

The commentator is rather puzzled by this elaboration, particularly as it does not lead to any very clear recommendations. One is not given guidance as to how to choose one's method. A table (3.11) is provided showing certain elements

¹³In the illustrations in the report $m = n$ but, in general, this is not necessarily the case.

of the inverse matrix resulting from five different sets of assumptions and it is true that these differ by larger amounts than one might have anticipated. If, however, one eliminates one technique (Table 3.3) assuming that “only outputs are transferred”, the results are quite close to one another.

The Summary about IO in the report is worth quoting in full:

“3.66. From what has been said it is clearly impossible to prescribe an input-output table that is ideal for all purposes in every country. However, for most purposes in most countries, a good prescription might run as follows. The table should be of medium size, with around fifty branches, based on rectangular input and output tables. Basic values provide a suitable means of valuation and, if only one table is to be constructed, a commodity \times commodity table is to be preferred to an industry \times industry table. Inputs should be transferred as well as outputs and, while special information should be used as far as possible in doing this, the mechanical methods, which in most countries will have to do nearly all the work, should be based on a mixture of assumptions, the precise mixture varying with the nature of industrial connexions in different countries.”

While we agree with the new SNA that the table should be based on commodities (as distinct from industries), with valuation at producers' basic prices, we consider that a fifty branch commodity table is too small.

We recommend a much more detailed commodity treatment in regard to which the results of a number of experiments are available. The usual objections to this proposal are that the table would be (i) of impossibly large dimensions and (ii) that it would be difficult to construct. As to (ii), every practitioner knows that an IO table is hard to make (and that, in the making recourse must be had to all kinds of expedients not strictly ethical, statistically speaking). Commodity-procedure is already used with regard to the rows of the table. If “commoditizing” the columns is arduous, the extra work is proportionately small and, we suggest, well worth while.

PRICE AND QUANTITY

Chapter IV of the new SNA deals with the factorisation of value flows into price indexes and quanta. It may be because the commentator, after a lifetime's experience in this field, is too set in his ways, but he found the opening section of this chapter unclear. He suspects that his viewpoint differs rather fundamentally from the compiler's! For instance:

“In the first place, a significant part of this income (net disposable income of households) is likely to be received in the form of transfers from government and this part can hardly be decomposed into a price and quantity component.”

Why not? We are not told. From the viewpoint of householders one suitable deflator is obviously a consumer price index. To continue the quotation:

“In the second place, while some other forms of household income, such as

wages, could be decomposed into an average rate of earnings and an amount of labour supplied, this would not be what is needed because the concept of income at constant prices, or real income as it is usually called, relates to what can be done with income, rather than what has to be done to earn it.”

This is an *ex parte* statement, but it is revealing: the compilers seem unable to accept the notion that for certain flows more than one valid price deflator is conceivable, the index “depending on the use for which required,” to quote the time-honoured *cliché* of statistical methodology. For analysis, what workers put into the national cake, and what they take out of it, are both clearly important. In fact the two values (at constant prices) have been juxtaposed by the writer (in constant price tables for Ireland),¹⁴ the difference between the two values being termed “employee increment”. Other examples (for which more than one valid price deflator is conceivable) are savings (deflators could be (i) the consumer price index—to measure present day consumption sacrificed—or (ii) a capital price index) and the current export balance (positive or negative, for which *a priori* valid deflators might be a capital price index, import or export price indexes).

Every gross value flow is factorisable into price and quantity, an exercise of paramount importance in these days when, if inflation is not yet galloping, it is off at a spanking canter. Admittedly one sometimes has to have recourse to pretty doubtful price indexes (always bearing in mind that the consumer price index is a fairly good indicator of “the general level of prices”¹⁵ and mercifully the current values for which dubious deflators have to be used are usually small). If experts don’t deflate (even with a twinge of conscience) others less expert will, for it must be done. Tables of national accounts at constant prices (necessarily consolidated and aggregated compared with the current series) for year to year comparison (with concomitant tables of price indexes to enable us to identify the major inflationary flows) are far more important than the current value tables; in fact the latter’s main function is but a means to the end of constant price tables. At the highest level of consolidation, GDP at constant prices is more significant than at current prices.

Most analysts nowadays prefer to have price and quanta appear explicitly in their equations for particular items, instead of current values. Both are usually endogenous variables—think of the simplest examples, equations of supply and demand.

Sets of national accounts, at current or constant prices, are not ends in themselves. Their purpose is to display the items in their logical relation to one another, in the different sectors of which the economy is deemed composed. It is the items which are important, not the accounts, which serve the purpose of accurately defining the items. The writer’s own work on accounts at constant prices shed a flood of light (for him) on the meaning of some of the items in the accounts including the discovery (which may appear naive) that profit, of its

¹⁴R. C. Geary, “Productivity Aspects of Price Deflation”, *Studies in Social and Financial Accounting; Income and Wealth Series IX*, Ed. Phyllis Deane, Bowes and Bowes, 1961.

¹⁵R. C. Geary, “Some Thoughts on the Making of Irish Index Numbers”, *Statistical and Social Enquiry Society of Ireland*, 1944.

nature, is a residual, not, properly speaking, a more or less constant proportion of price, as employee compensation may be deemed to be.

“In spite of this it is generally considered important to give numerical expression to such aggregates as gross national product at constant prices” might be considered *the* understatement of the report. Every country has a plan of sorts and invariably in the plan there is a statement of the rate of growth per cent per annum to which the country aspires. This rate concerns GNP or GDP at constant prices. So how can we do without these? Happily, it is not so suggested.

The writer, having striven without success to understand paragraphs 4.3 to 4.8, turned to the tables at constant prices proposed in the new SNA. These are reassuring, as far as they go. Table 8a provides for GDP at constant prices as the aggregation of constant price items consumption plus capital formation plus exports minus imports, and Table 8b gives the concomitant price indexes. Table 9 requires GDP (in both producers’ and basic constant values) classified by branches of economic activity. Table 10 has employment (number of persons engaged) and man hours also classified by economic activity. Table 11 provides for supply of commodities from each industry in commodity classification and, for each commodity group, the disposition of supply (to other industries, to final consumption, to exports). Table 12 has input and output, providing for added value at constant prices of each industry. Tables 13–15 will give final consumption by purpose of outlay or type of expenditure, separately for government, non-profit bodies and households, the latter classified by (i) type of expenditure (durable goods etc.) and (ii) commodity group (food etc.).

Table 16 relates to the composition of gross domestic capital formation at constant prices. The composition proposed is two-fold (a) by type of capital good (with fixed capital and increase in stocks distinguished, showing e.g. residential building and stock increases in wholesale and retail trade), and (b) for fixed capital formation alone, classification by kind of economic activity (agriculture etc.). The (fixed price) proposals of Table 16 are similar to the current values required for Table VI of the old SNA.

Presumably consideration of the problem of estimation of fixed capital stock is deferred to the future SNA which will deal with the national balance sheet, a good deal of preparation for which is contained in the present SNA, but at current prices. It is necessary here to remark that annual statistics (say as at January 1st) of capital stock, classified by branches of economic activity have become a prime analytical necessity.

At constant prices (in the writer’s view) two kinds of capital stock figures are required, namely the (i) depreciated and (ii) undepreciated versions, the latter required for productivity studies. Take the case of a machine costing £100 new with an actual anticipated lifetime of 10 years. With no change in prices its selling value after 6 years would be about £40, which is the value to appear in a balance sheet. During its whole lifetime, however, its annual output may be presumed unchanged so that for the estimation of capital or factor (labour plus capital) productivity its value is always £100 while it is in use. Of course this statement is subject to all kinds of qualifications but perhaps it is enough to make the point that two kinds of fixed capital stock figures are required, at both current and constant prices.

The report makes the important point that in Tables 8 and 13–16 valuation is at purchasers' values only, implying, in particular, that household consumption, classified by commodity, realistically is at these prices. While generally sellers' prices are best for IO purposes they have the disadvantage that the values shown in the household demand column look highly artificial as showing for each good the value the producer received (not what the consumer paid) necessitating very large aggregate entries for items transport and distribution.

In Tables 9–12 generally basic values are used.

Added value at constant price. It is of interest that this principle is recognised in the new SNA, the estimating formula being output *minus* non-factor input, each valued at constant prices. Ireland is a pioneer in this field, having started a series for agriculture during the last war. The remarkable phenomenon was noticed that, though volume of gross output was fairly well maintained, volumes of purchased feeding stuffs and fertilisers (input) reached almost the vanishing point. So, to measure quantity of work done, gross output and input were valued at constant prices and subtracted. It seemed to CSO to be an obvious thing to do; it was discovered later that the method had been suggested independently by S. Fabricant (U.S.A.) and by R. Wilson (Australia). Though the resulting net output figure for Irish agriculture contained an element of "mining the land" it showed a perceptible increase in this usually stable figure compared with pre-war. This net figure (and not gross output—and still less input—indexes) was the correct measure of efforts of agriculturists during the emergency.

Efforts to apply the method to Irish industries were not so successful^{16,17} and have not yet been officially adopted. Experience showed that the theory of the method was sound but that the Irish CIP data was probably not reliable enough; also there was the difficulty that the deflating "prices" were really unit value indexes, involving quality change troubles. Australia, in particular, had similar difficulties in application. Part of the trouble in Ireland was that, at the two periods of investigation, firms in each industry were few and aggregate output small. Larger countries might have a happier experience. Geary and Forecast surmised that, at the individual industry level the method cannot successfully be applied unless firms at CIP are required to furnish values of the individual items of output and input at both prices in year of reference (as they do at present) and the same quantities at prices in previous year.

The Irish empirical test of adequacy, at individual industry level, of indexes of constant price added value was that they should not fluctuate too much from year to year. Unfortunately Irish industries over periods of years failed to pass this test.

To what extent has the new SNA seized these points? One thinks that, from paragraph 4.81 (where mention is made of the perpetual inventory method of estimating gross fixed capital stock by accumulating annual figures of gross fixed capital formation at constant replacement costs and deducting capital "retired, scrapped or destroyed"), the principle seems to be accepted that each

¹⁶R. C. Geary, "The Concept of New Volume of Production with Special Reference to Irish Data", *Journal of the Royal Statistical Society*, Parts III–IV, 1944.

¹⁷R. C. Geary and K. G. Forecast, "The Use of Census of Industrial Production Material for the Estimation of Productivity", *Review of the International Statistical Institute*, Vol. 23, Nos. 1–3, 1955.

item of fixed capital installed is given the same value during its working life for the purpose of productivity measurement. There is mention of “average, normal lifetimes”, but this may mean that each asset is valued at, say, half its purchase value, an unimportant change from the concept described above. The point is that this productivity capital value will differ conceptually from the balance sheet value. This point must be made explicitly since in certain circumstances the difference may be substantial.

The interesting Table 4.7, using illustrative data, displays Laspeyres and Paasche quantum index numbers for broad categories of economic activity, showing gross output, value added, labour, capital and factor inputs, and productivity. These indexes are for a single year only so we are not in a position to study year to year fluctuations in the constant price value added index numbers. Nor are we sure that the illustrative data are actual. Anyway, we calculate that the standard deviation between the 13 economic categories is 0.1871 for value added, much greater than the 0.1362 for gross output. While this experience would be better than CSO’s in Ireland, it affords evidence that, from the practical point of view, all countries will be well-advised to scrutinise their constant price value added estimates, especially for industries which show undue fluctuation from year to year, in comparison with fluctuations in output and non-factor input. UNSO might usefully disseminate the experience of countries with this problem, with special emphasis on techniques of correction in dubious cases.

Index number formulae. The writer agrees with the compilers that quanta are best obtained as quotients of values by concomitant price indexes. In Ireland, while aware of the hazards of the practice, we prefer the link (year to year etc.) type of price index as keeping the weighting up-to-date. For constant-price macros it is best to use as a single deflator the Irving Fisher Ideal = $\sqrt{\text{Paasche} \times \text{Laspeyres}}$.

Trading gain. Surprisingly, there is no mention of this, in its national or in its sectoral aspects. There is, it is true, a cryptic reference of *non possumus* character in paragraph 4.7, which might be interpreted as a rejection of the idea, though this may not be what is meant.

In the past the writer has been a vigorous controvertialist on the subject of articulated (double-entry) accounts at constant prices¹⁸ and he has no desire to raise the general issue here, mainly because he has a lower sense of the importance of national accounts, as such, at current or constant prices, now than he had in the past. It is the individual items in the accounts that matter. Actually there would be little difficulty in setting up such a system at constant prices in a country able to give the data required for Tables 8–16. This system would be at a more consolidated level than those proposed in this report.

Constant price balancing accounts differ from current price accounts in that it is not possible to get up the former without introducing additional variables. The most important of these is the *external trading gain* which arises as follows. If the external account at current prices is E (exports) – M (imports) = N (investment abroad), the constant price version is $E' - M' + T' = N'$, where primes indicate constant price values. The additional variable T' has had to be introduced to balance the account since there is no reason why $(E' - M')$

¹⁸See, e.g., articles by writer in volume referred to at ¹².

should equal N' , since its current price value N (which may be + or -) is a well-defined flow and requires deflation in its own right. It is easy to show that to define N' as equal to $(E' - M')$ can lead to nonsensical results. On the other hand the constant price variable T' is found to have a very important economic interpretation.¹⁹

There has been general agreement about the form of the constant price external account. Controversy raged about the deflator to use to derive N' , some favouring import, export or investment price indexes.²⁰ Recent research²¹ using very testing Irish data has shown that it matters very little, for its effect on the estimate of T' , which deflator is used. This result is of considerable importance since it turns out that T' is large, actually of the same order of magnitude as the year to year changes in constant price GDP.

The trading gain T' , an element in national welfare, arises solely through differences in import and export prices in the sense that if, between base and current year, these price indexes were the same its value would be zero; if the export price index exceeds the import price index its value is positive; if the import price index exceeds the export price index its value is negative. It is related to the more familiar *terms of trade*, but far more significant, in yielding, instead of an index number, an absolute value measuring the improvement (or disimprovement) of the nation consequent on trading price movements. It is an element in national productivity; if one wishes one can term productivity in the ordinary sense *technological* productivity. If the value of T' is positive the quantum production of the nation is increased *pro tanto*; contrariwise, decreased. It is of such a magnitude that gains in technological productivity can be eliminated by an adverse movement in external prices. All this is very obvious, conceptually. The point is that T' measures the effect.²²

One can also envisage trading gains (or losses) between sectors, e.g. between agriculture and the rest of the world (including internal non-agriculture).

The trading gain is dealt with here at some length in the hope that the pros and cons will be treated in the next SNA.

Methodological reflections. The making of index numbers is far less a matter for mathematics (stochastic or other) than for commonsense (which we may qualify as "enlightened") in dealing with one's data. The situation used to be such that the writer could remark that 100 different statisticians each with the same set of data would produce 100 different index numbers (though perhaps not differing much). Perhaps practice has improved since his time.

As an example of the kind of empiricism involved, suppose one favours a base-weighted Laspeyres. If one is in a position to use a Paasche, i.e. one knows current weights, it is always a good idea to calculate the Paasche as well as the Laspeyres (the "official" figure). If the two figures seriously (with one's own

¹⁹The full constant price version of the simple system discussed at the outset will be found by equating row sums with column sums in the matrix on Page 225, the symbols there being unprimed. Thus the two identities containing trading gain T are $Y = P + T$ (a welfare statement) and $E + T = M + N$.

²⁰See, e.g., volume referred to at ¹².

²¹R. C. Geary and J. L. Pratschke, "Some Aspects of Price Inflation in Ireland", *ESRI* Paper No. 40, 1968.

²²For a simple numerical illustration of what trading gain means see pages 9-10 of R. C. Geary, "The Irish Woollen and Worsted Industry", *ERI* Paper No. 7, 1962.

notion of “seriously”) diverge, it is an indication that the base weights are outdated and should be changed. The great advantage of the link-relative system is that one’s weights are always up-to-date, as with it one uses only data for consecutive pairs of years.

Have we really made any appreciable advance with those two bugbears of index number methodology, the changes in quality problem and the estimation of quanta in some important service industries (e.g. general government, education)? The first of these is exacerbated by the fact that manifestly change in quality of goods is occurring at an accelerating rate. The writer recalls that during the last war he adopted the principle (in making the consumer price index) that “goods with the same function, designed for the same people and marketed through the same outlets, are the same” (i.e., as pre-war). This was a case in which the material of which the goods were made had changed or had greatly deteriorated in quality, e.g. tea. Of course, this principle would not be too crudely applied: nobody in his senses would regard two ships, one of 10,000 tons and another of 100,000 tons, as similar units. And reference may be made to R. Stone’s well-known result, using regression methods for demand analysis, that our habit of using specific gravity for adjusting prices of beer was unsound. Perhaps an approach might be made to manufacturers in some cases: “What would you have charged for the new variety at prices ruling at the time of the last report?”

The second problem is also becoming more acute through the ever-increasing proportion of the labour force in services. It is true that double deflation can be applied to wholesale and retail trade and that, broadly speaking, passenger and ton miles can be used for measuring quantum production in the various divisions of transportation, and that numbers of letters, packages and ’phone calls can be used for estimating volume of communications. These proposals must be qualified by the sobering thoughts that world airlines, the division growing most rapidly, have so far been successful in that obscurantist opposition to supplying adequate statistics: they must not be allowed to evade their responsibilities to the nations, any more than other branches of transportation. But there remain large areas in which we know not what to do, except the sorry expedient of deflating values by the general price index, permissible only when flows are small.

One is aware that useful work has been done in these fields but it is patchy as regards countries and commodities. These reflections are set down to make a *prima facie* case to the UNSO, in connection with the next SNA, to collect systematically world experience in these two fields, to encourage studies in statistical bureaus and research institutes and to publish monographs thereon in their methodological series. Indeed methodological monographs covering the whole field of the new SNA would be of great value. This has been the helpful practice of UNSO in the past.

STATISTICAL DISCREPANCIES

National prestige is involved in the production of sets of national accounts with probable deterioration in standards of quality of statistics compared to those of other days.

In a short treatment of this important aspect of national accounting the new SNA has wise things to say. It is pointed out that GDP (central in the new SNA, compared with GNP earlier) should be independently estimated from gross output and intermediate consumption (non-factor), incomes and final outlays on goods and services. Figures of national and disposable income are to be compiled from data on the receipt and disposition of incomes. So differing figures for saving inevitably arise. If they are too discrepant some of the constituent elements in the accounts are wrong and must be corrected and discrepancies eliminated. The report states that such elimination "should be based on intensive examination and comparison of the reliability and accuracy of the various detailed series which enter into the divergent estimates."

The writer would be even more emphatic and specific. Every official statistical bureau should have a section whose wholetime task is testing the reliability of all official statistics. In all major inquiries meticulous sample post-enumeration checking should be routine. The definitions of items should be closely scrutinised. For instance, are imports, allegedly c.i.f., really f.o.b. or (more likely) valued at point of delivery? (In the new SNA—sensibly—imports f.o.b. are required, thus isolating transport changes on imports.) As regards (f.o.b.) exports from Ireland, are cattle valued precisely at Dublin and other ports? The writer recalls that in his time in CSO three valid estimates of aggregate household consumption emerged from different sources, the highest being 20% larger than the lowest, an experience which went to show that correction of discrepancy is not necessarily small. It was about that time the writer evolved the aphorism, "The only statistical truth is that statistics, purporting to be the same but coming from different sources, are different."

In theory the self-balancing property of the accounts generally affords as many opportunities as there are accounts for checking for reliability. This is obvious, if each item on each side of each account were derived separately, with no recourse to residues. In practice, such meticulousness would be wasteful. Still, it is generally true that one of the main advantages of national accounting might be its improvement in the statistical quality of national economic statistics.

The writer has had little experience in recent years of compilation of national accounts so, for all he knows to the contrary, the statistical quality of items in the accounts may have improved in the meantime. (One notes²³ that the "statistical discrepancy" in 1966 in the U.S. national income and product (balancing) account, the items on each side of which were presumably independently estimated, was \$2.6 billion which, with a GNP of \$743.2 billion, was satisfactory enough.) In his time in UNSO he made a special study, for a number of countries (including his own) of indubitable statistical respectability, of their national accounts, to be disturbed by his findings. The test was a comparison of latest figures (often dubbed "preliminary") with corrected figures for the same year, published subsequently. Many of the corrections were massive which means that the figures originally published were very wrong indeed; and, of course, the latest figures published are the most important of the series. Often these corrections

²³*Op. cit.*² page 2.

went back for several years, with explanations vouchsafed in very few cases. No wonder a well-known short term econometric forecaster could seriously claim that the forecasts emerging from his model, but discrepant with preliminary official figures, were as likely to be right as the official figures. This perpetual chopping and changing is irksome to users of national accounting data. As already suggested, the situation may have improved; if not, this problem should continue to receive special attention in UNSO in its methodological series.

The new SNA asks for a vastly greater number of particulars than the old and there is obviously an acute accuracy hazard here. As already remarked, countries regard the availability of national accounts as involving national prestige. Hence there may be a temptation towards guesstimates for many items. This is all very well for small items—one should not waste statistical resources on meticulousity—but should be anathema for larger items.

DELAYS

Close attention should be given to statistical time schedules. As a former director of an official statistical bureau the writer is well aware that delays in the appearance of allegedly “current” statistics are not the fault of the bureaus but of their correspondents. Delay in publication has always been a problem; what is unfortunate is that one has no sense of perceptible improvement in recent years. One must have a certain sympathy with e.g. industrial concerns in this regard. The forms they have to fill up are very detailed; their preparation is time-consuming and therefore costly; and the vast majority find no use for this data within their firms. An effort²⁴ to show them how to use these data to improve their efficiency has had little impact. The writer, in his own time, did all he could. He now thinks that, with the vast improvement in telecommunications, there might be a possibility of dispensing in many cases with form-filling; or a field staff might call on large dilatory firms and get the essential particulars on the spot. There may be nothing in these suggestions but there is everything in the firm proposal that official bureaus should examine fundamentally their methods of data collection. It is intolerable that data of essential value for dealing with crises (large or small) become available only after the crisis is past or, more often these days, deepened. Here again UNSO might give a lead, having special regard to the problem of “the quicker the wronger”.

The writer finds that many of the preoccupations expressed here were in his mind for many years. In a paper delivered in 1947²⁵ there are remarks about accuracy and the time schedule of statistics. He ventures to submit a couple of quotations:

“On a great occasion like this, one must be allowed to indulge in flights of fancy, so I may confess that, as an extension of the sampling

²⁴R. C. Geary, “Do-It-Yourself Economics of the Firm: First Draft of a Statistical Scheme”, OECD *Productivity Measurement Review*, 1965.

²⁵R. C. Geary, “Some Tendencies in the Theory and Practice of Statistics, in Ireland and Elsewhere”, *Statistical and Social Inquiry Society of Ireland, Centenary 1847–1947, Proceedings*, 1947.

approach, I have often envisaged the statistician as sitting in a room like an engineer in a power-station surrounded by gauges recording electrically, almost simultaneously as they occurred, changes in various economic phenomena; . . . but if [this system] had been in operation would not many of the economic depressions have been arrested at an early state, before they had assumed these secondary and psychological momenta which are so difficult to correct?"

and in the Summary:

"(3) After some remarks about a rudimentary but important theoretical point, the urgent need for setting up Sampling Sections in official statistical offices is stressed."

"(4) It is suggested that the nations should endow the international statistical offices of the United Nations and of the International Labour Organisation with advisory and supervisory powers in regard to all technical aspects of national statistics so that these may conform to a specified standard of reliability and accuracy."

THE RUGGLES SYSTEM

Our authors use a neat diagrammatic method for showing the structure of different systems of national accounts which they use with effect on the present U.S. system, the old and new SNA and on their own proposed system for U.S. We reproduce the latter two of these in Figure 1. In each, rows indicate economic sectors and columns type of account. Boxes indicate individual accounts. The exact heads in the accounts are given as Appendices B and C of the book.

We hope that the content of each account will be reasonably clear from the figure. A box falling within a row-column intersection means that its rubrics are those appropriate to the row and column; a block covering more than one intersection contains rubrics appropriate to more than one sector or account; such accounts are consolidated. And in such cases, as the authors point out, inter-account and/or intersectoral flows will be lost, i.e. they are consolidated out.

In the Figure 1 (for the new SNA) box II represents the gross domestic product and expenditure account. We venture to modify the RR version of this box as we don't understand why RR does not have it cover the last two sectors since the account contains rubrics relating to income, private consumption expenditure, exports and imports which certainly pertain to Households and Rest of World. Also we include a little box for account II-F—domestic services of households, omitted apparently through inadvertence.

The authors in their modesty do not make the claim, but if tidiness and simplicity be economic virtues the Ruggles system must be preferred to the new SNA. Actually the new SNA is even more complicated than appears from the figure since accounts II-A, 1, 2, and 4 and II-C 1 are merely illustrative: There will be one of each account for each industrial group.

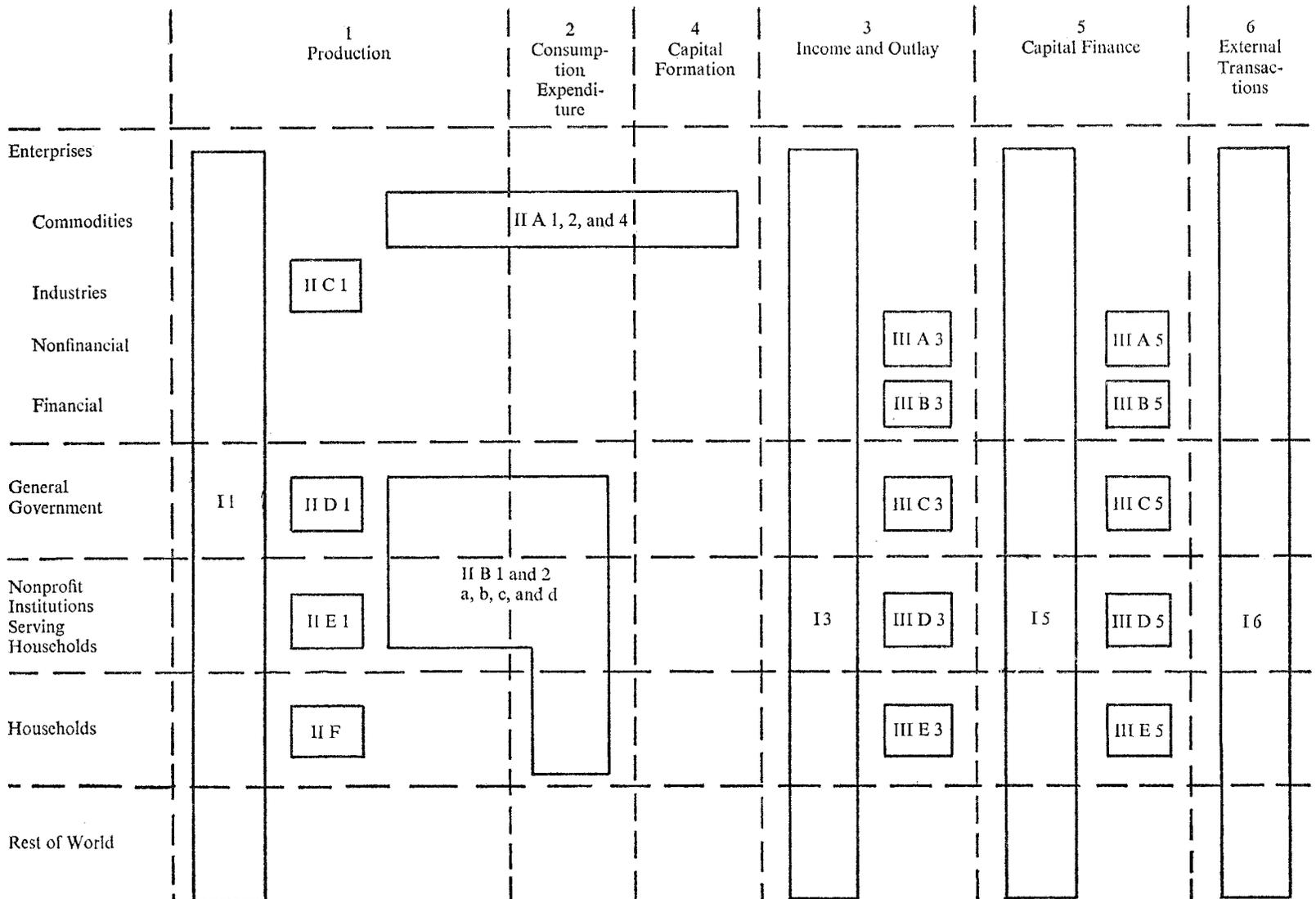


Figure 1. The Structure of the New IIN System of National Accounts

	Production	Income and Outlay	Capital Formation	External
Enterprises		2a. Enterprise Income and Outlay Account	2b. Enterprise Capital Formation Account	
Government	1. National Income and Product Account	3a. Government Income and Outlay Account	3b. Government Capital Formation Account	5. External Transactions Account
Households		4a. Household Income and Outlay Account	4b. Household Capital Formation Account	

Figure 2. The Structure of the system of National Income Accounts Proposed by RR.

The authors give not only the rubrics of their eight proposed accounts, but also U.S. estimates for each of these rubrics in 1966. As they do exactly the same for the official U.S. system of accounts, the two systems statistically can be compared. This the authors actually do. The official U.S. accounting ideas are quite conventional, i.e., they agree with those of the old SNA except for one peculiarity: in U.S. general government is deemed incapable of capital formation! His friends, who know his views on this oddity, would surmise that in any proposals for revision in which Richard Ruggles had a hand this anomaly would be the first to go. They would be right. Not only that, but households (a sector analogous to government in many ways) are deemed capable of capital formation in all consumer durables (and not only owner-occupied dwellings as heretofore), yielding an income like all capital. In the vernacular, we could not agree more!

In fact, quite apart from their proposals about the form of accounts, the authors' ideas on the definition of items like income and capital formation are revolutionary. They involve massive recourse to imputation to such extent that the estimate of GNP in U.S. in 1966 would be increased from \$743 billion to \$903 billion. The authors show the transition:

	\$ billion
GNP, official	743.3
<i>Plus</i> Services of durables and past development outlays:	
Households	64.0
Government	52.0
<i>Plus</i> Business outlays:	
Development	26.0
Consumption	18.0
GNP, revised	903.3

Consumer durables expenditure is no longer regarded as current, but capital, annually yielding income and requiring depreciation. Developmental expenditure of enterprises, government and households, all three, are regarded as capital formation, a concept which is unexceptionable, since expenditure in a given period (almost invariably a year) which yields income in cash or non-cash satisfaction beyond that period must be regarded a gross capital formation. So, as regards households, "the rearing costs of children, the opportunity costs of students in the labor force, medical expenditures by households, and the mobility costs of families moving from one location to another (may) all be considered intangible capital expenditures." The term "amortisation" is confined in its use to depreciation of developmental expenditure.

If households can make capital expenditures, our authors hold that enterprises can make current expenditures, "direct business consumption in the form of goods and services provided free to the public (both customers and employees) must be included."

Other attractive ideas are enshrined in the following hypothetical account for an individual establishment in the enterprise sector:

Compensation of employees	32	Sales	95
Imputed self-employed compensation	3	Change in Inventories	5
Imputed interest on plant and equipment	5		
Net operating surplus (+) or deficit (-)	+17		
	<hr/>		
Income originating	57		
Capital consumption	10		
Indirect taxes	8		
	<hr/>		
Gross product (value added)	75		
Intermediate goods and services	25		
	<hr/>		
Value of Product	100	Value of Product	100
	<hr/>		<hr/>

We notice that "net operating surplus" (advisedly qualified by "(+) or (-)" is net of (a) salary of working proprietors, and (b) interest on plant and equipment.

This concept is of the greatest import for countries still with a large number of unincorporated enterprises (farms, shops, family hotels, etc.). For the vast majority of these there is no doubt that the "net operating surplus" in Ireland would be small or even negative when proper allowance is made for employee-type compensation of family workers. It does not necessarily mean that a farmer whose holding is worth £20,000 in the market and who has a large net operating deficiency year after year should sell out, because the intangible satisfactions of possessing land, health considerations, etc., may outweigh those of a larger cash income; but at least he should know what he is doing in making his choice.

The authors' proposals have naturally the largest effect on gross private domestic investment:

	\$ billion
Gross private domestic investment, official	118.0
<i>Plus</i> durables:	
Households	70.3
Government	41.2
<i>Plus</i> development:	
Households	12.7
Government	40.0
Enterprises	26.0
	<hr/>
Total domestic capital formation	308.2
	<hr/>

So \$118 billion (noting again that U.S. investment is, by definition, private only!) becomes \$308 billion! It may be added that these huge increases are mainly due to the gross concept. When figures are netted (for depreciation and amortisation) the increases are less drastic, thus national income increases from \$617 billion to \$660 billion.

IMPUTATION

The authors' ideas involve large recourse to imputation. "To provide a complete picture of economic activity, it is often necessary to impute transactions in situations where important economic activity is taking place but no market transaction occurs." The authors state that both the ideas and the estimates have the formidable authority of John W. Kendrick and that much of the discussion is based on Kendrick's work.²⁶

Official statisticians dislike imputation, mainly because imputed values, even if estimable, are rarely unique, so that elements of arbitrariness enter into their selection. There is no avoiding some imputations such as farmers' consumption of own produce, indubitably part of their production and income, valuations of stocks and of capital consumption. As to the element of arbitrariness: should consumption of own produce be valued at farm prices or retail? Whether a firm shows a substantial profit or loss may depend on opening and closing stock values. Our authors state that their imputations can be valued, in proof whereof they give estimates for U.S. in 1966 for their form of national income accounts.

It has been stated that stock valuation and depreciation would not have entered the consciousness of businessmen were it not for the taxman and the accountancy profession. Business has its own belwethers, cash flow and the like, business decisions being based on such as these. And economists trying to discover how the economy works (and they are still far from knowing) must have regard to these kinds of statistics, as causative, however naive they may regard them. And businessmen's statistics (i.e. those that "make them tick") are actual, with never an imputation amongst them! It is a sobering thought that businessmen on the whole have been better at their job than have been economists at theirs.

Our authors discuss the familiar problem of inclusion of unpaid family activities in national income: from the earliest national accounting times there was mention of that romance of the man who married his cook thereby reducing the national income. Today the opposite obtains, namely of housewives entering the paid labour force. Unless their prior domestic service is valued (say at opportunity cost as Kendrick suggests) the increase in national income will be overvalued thereby. Also there is the vast amount of valuable voluntary service, charitable work, committee work, work in the home, etc., performed by family members, not included, i.e. priced at zero, in national income. The authors make no imputations for all these family services mainly because of statistical difficulties. One senses, however, that they feel the illogic of their position and one sympathises with them. They state, "The question of productive activity within the household unquestionably needs further study."

Provided that in one's statistical construct what are (or purport to be) actual and what are imputed values are clearly distinguished (as they are by our authors), there is no reason why recourse should not be had to imputation on a wide scale. In national accounting the large aggregates like GNP are less impor-

²⁶Since the above was written J. W. Kendrick's *Economic Accounts and Their Uses* (McGraw-Hill Book Company, 1972) has been published.

tant than the details. Sometimes we may want actual values, sometimes totals (including imputations). Give, within reason, everything.

An argument in favour of a liberal imputation policy is that only those elements for which statistics are available are taken into account in the determination of policy, public and private, other elements, some of great importance, tending to be ignored or set at little value. People of philosophic turn might argue that availability of statistics is responsible for disseminating wrong philosophies of life (including worship of production of any kind) in affluent communities.²⁷ We do not know if our indifference to the problem of poverty is a cause or a consequence of the unavailability of good statistics of income size distribution. It is simply wrong that the services of housewives in the home are left out of account in any rational assessment of national output. Once we set a value on these services, there is no reason why economics should not take over, with its ideas of different prices, productivity and all the rest, the general idea being improvement in the quality and prestige of domestic service.

Where statistical evaluation is inconceivable, algebraic symbols might be introduced "lest we forget". Thus if on statistical considerations the arguments in favour of building a factory or (a town) in location A are about equal to those for location B and A is healthier than B (but we have no measure of health), then location A is to be preferred or in "algebra", statistically $a = b$ but socially $a + x > b - x$, $x =$ salubrity, a positive quantity, but deemed unestimable.

Of course there is no reason why we should not evolve a statistic (vector or scalar) for this x . In fact there are few social factors that we cannot "statitize" if we set our minds to the task and if we have not too sensitive statistical consciences. But, to repeat, in our constructs we must clearly indicate values which are imputed, frankly recognising that they are lower in the scale of statistical quality than are actual flows.

CONSOLIDATION OR DECONSOLIDATION?

Within the logic of its Table 2.1 the new SNA involves a building up from the elements of an immensely detailed matrix. The report shows how one arrives at the various consolidations required including tables of national accounts, input-outputs, flow-of-funds. This approach has the great advantage that all consolidations are absolutely consistent in terms of figures. But do they yield the details required, if each such compilation be considered on its own merits?

Our authors take a fundamentally different line. In the final chapter of RR they set out their philosophy on economic system-making:

"In providing the framework, it is more reasonable to develop an aggregated set of data as a central core and to show detailed information as deconsolidations than to attempt to specify as the basic elements in the system masses of detailed data that can be aggregated in a number of different ways to provide alternative constructs."

This is understood to mean that it is preferable to set up the different systems (national accounts, IO, flow-of-funds etc.) each on its own merits with national

²⁷See J. W. Galbraith's, *The Affluent Society* (Houghton Mifflin Company, Boston, 1959).

accounts central, rather than build up the different systems from a vast matrix of details. The writer agrees with this philosophy.

THE FULL SYSTEM

The authors' full system of accounts is shown in their Figure 5 which we reproduce as Figure 3. The first row are the national income accounts, already given in Figure 2. We are shown how IO and flow-of-funds emerge as deconsolidations of the basic (first row) accounts. And our authors provide in their Accounts 12 and 13 for national wealth and national balance sheets.

The system comprises sixteen tables, all fully defined rubric-wise. We have no difficulty in seeing how Account 6 (IO) derives from Account 1. Account 9, like the Income and Outlay Account, has three sub-accounts. Accounts 7, 10, 12, 13 are clearly related to capital formation. As we might expect the rubrics in 10 and 13 are identical for IO simply represents annual *changes* in 13; similarly, if in a slightly more complicated way, with 7 and 12. We must not cavil if we don't quite see what Account 8 is doing in the IO row. Whatever view we take about its comprehensiveness there can be no doubt about the elegance and simplicity of the Ruggles system.

But comprehensiveness is the trouble. There are no proposals for accounts at constant prices, no tables for price indexes and constant price data. In fact, the only reference to the whole subject is a rather casual page or so in the text. As this commentator is of the opinion that constant price data are more important than current price data, regarding the latter as but a way to the former, he must regard this omission as serious from an otherwise excellent book.

Authors are entitled to define the scope of their work and our authors may have intended to deal only with current accounts. They do not say so. All their tables are accounts; there are no "Supporting Tables" like SNA's. One wonders (and with a certain sympathy) if the authors would ask if, since national accounting synthesizes all economic statistics, where is one to draw the line in the vast corpus of such statistics between what are to be regarded as supporting and not, especially if one takes the view of the writer that micro analysis offers the better prospect of fruitful results rather than does macro, somewhat unsatisfactory result-wise so far?

COMPARISON

This commentator does not presume to choose between the new SNA and the Ruggles system.

Suffice it to say that the two systems are very different and authoritative reconciliation is necessary. Up to a point (though we think our authors politely pulled their punches a bit) we know what the Ruggles think of SNA; we would like to have the reverse process from the UN Expert Group. Without knowing its rejoinder the writer is inclined to agree that SNA is too detailed. As a point of his own, he wonders if the very thorough and analytically valuable study of industries' production of uncharacteristic products in SNA has not distorted the balance of the report? Is this aspect so fundamentally important?

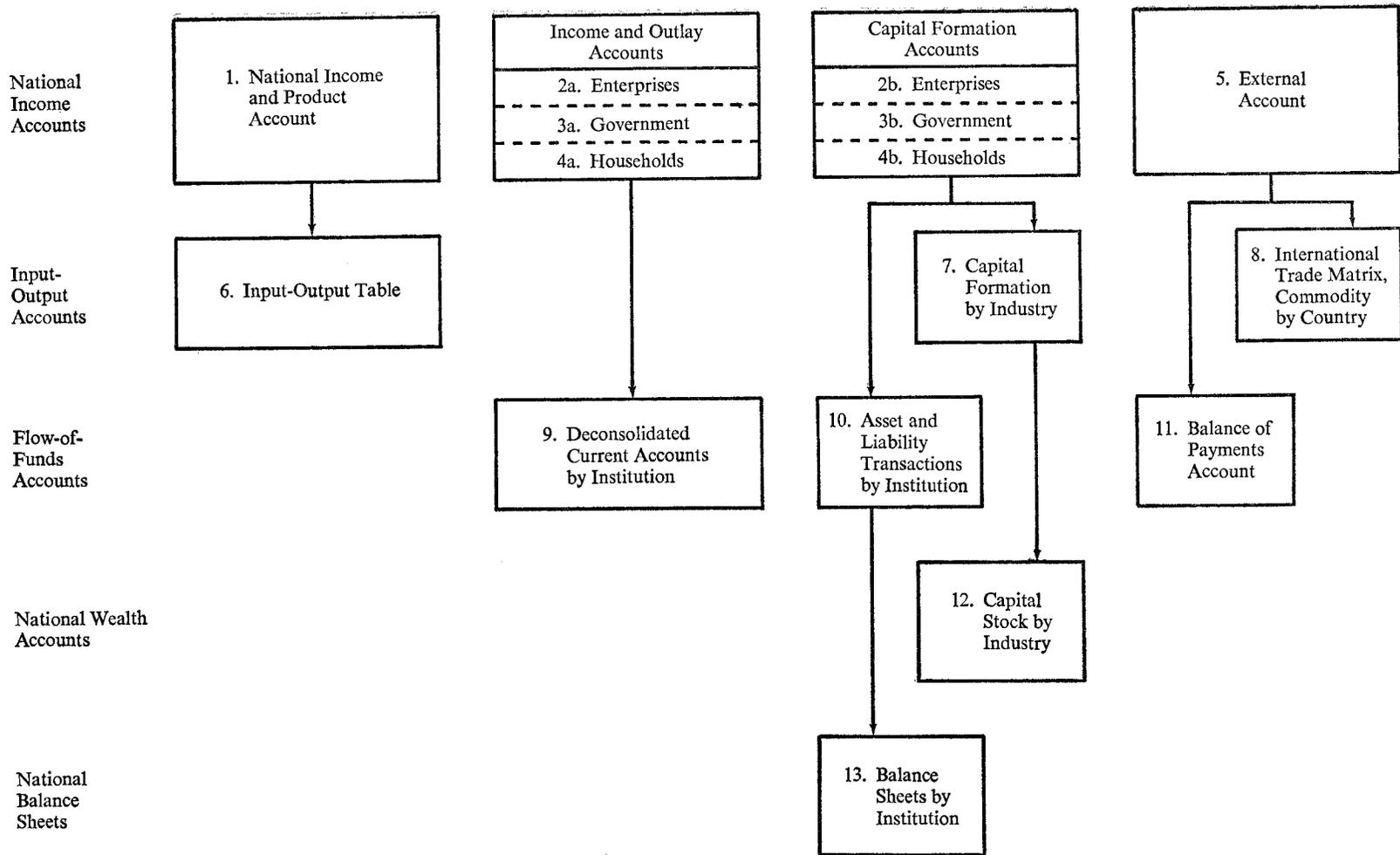


Figure 3. The Proposed Integration of the National Economic Accounts.

CONCLUSIONS

The writer has made no attempt to deal *seriatim* with these two works; he has confined himself in his comments to features in which he has a special interest. There are, for instance, in the new SNA, Accounts V (comprising nine accounts) relating to the public sector. In addition to the accounts there are twenty-eight "supporting and supplementary" tables proposed to which no reference has been made; having recognised that few, if any, countries can supply a full set of tables, the report has suggested an order or priority; and the writer commends to the reader an 8-page Glossary of main terms with which the report concludes. The writer earnestly recommends the new SNA to university departments of economics. Any student who could pass an examination on the report as it stands could be regarded as an expert in modern descriptive economics.

The new SNA asks for a vast amount of information. Only experience will show whether the supply is excessive or deficient. After all, the number of economic statistics published is vast and, even so, the analyst often finds that these are not what he wants; he has to add, subtract or otherwise manipulate. As far as the writer can judge the display is logical—the logic of Table 2.1—to which a lot of attention has been directed above. Insofar as the new SNA statistics are economically significant, there may be cases in which they impose themselves on us for analysis by this very fact. After all, as remarked at the outset, GNP itself was a concept of national accountants.

It is good to learn from the Preface that UNSO is constructing income distribution statistics within the framework of the new SNA. Since "income distribution" may mean many things, one must be quite specific to emphasise the importance of *size* distribution, in all its aspects, including personal and family income and income before and after redistribution. For economists with consciences (possibly the majority) the "obscene contrast between rich and poor"²⁶ is their primary concern, yet up to the end of the writer's time as an official statistician, these were about the worst developed of official statistics; they may have improved since. Poverty is almost the gravest problem facing the world today. Some means must be found for distinguishing the poor as a class in our national accounts and tables. The philosophy informing our present SNA is that if total GDP increases all benefit, an hypothesis which, to say the least, requires proof or qualification. It is demonstrably not true as between rich and poor countries.

Both works are methodological; hence they are addressed mainly to official statistical offices. Unless they have changed drastically since the writer's time, these offices are beset with work, with inadequate staff resources, so that an order of priority must be established with regard to their work. What resources should be devoted to the new SNA? This problem scarcely arises with regard to RR since, apart from the extension of imputation, the system proposed is quite like the old SNA, therefore far simpler than the new. We have endorsed the RR idea that each of the several systems (national income accounting, input-output, flow-of-funds and possibly others) should be developed according to their own

²⁶Alvin Toffler, *Future Shock*, The Bodley Head, London, Sydney, Toronto, 1970.

logic but statically consistent at macro points of contact, instead of a “unitary” system encompassing all as the new SNA proposes.

No statistics are an end in themselves but a means towards the end of better control and understanding of the economic and social system. National accounts are a synopsis of the economic statistics of the nation; actually these accounts are being extended to demographic and other social statistics. This means that *all* statistics for which the official statistician asks are “behind” national accounts. Then (we have asked) why select what are termed “supporting and supplementary” tables, especially as these lack e.g. income size distributions? RR propose none such, confining suggestions to accounts only.

As SNA is not an end in itself, everything depends on the usefulness, for administration and research, of the individual items displayed. The official is constantly confronted with the problem “How much do I publish?” of the literally millions of figures available. Clearly few. Provided users *know* that details are available and will be readily supplied on request (having regard to confidentiality, reliability, etc.) there may be no need to publish details of interest to few people.

With the new SNA, as with all official statistics, it is easy to point to elements which, of themselves, would be of little use to anyone. In some such cases, it is true, publication may be justified if these elements are constituents of a large important item, for purpose of definition, i.e. to show what the latter contains.

This commentator thinks it a pity that for the new SNA some means have not been found to avoid distinguishing the industrial provenance of commodities; the value of uncharacteristic products is small but makes a large complication. He also thinks that if the important proposals in RR for extending the idea of imputation were before the SNA Expert Group they should have been discussed. Similarly the idea of accounts at constant prices, much discussed at meetings of The International Association for Research on Income and Wealth, should have been dealt with for acceptance, modification, or rejection.

Hitherto resources devoted by official statistical offices to national accounting have been comparatively small, because the elements required emerged largely from other divisions. Staff requirements for the new SNA would appear to be considerably greater, raising, as already suggested, the question of priorities. These of course, will differ from office to office. This writer would regard improvement of time schedules of current statistics, greater accuracy and extension of inquiry to fill obvious lacunae (e.g. goods transport by road) as taking precedence of extending the present system of national accounting.