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A Comparison of the Structures of Three Social Accounting Systems

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BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

A. *Introduction*

AN INPUT-OUTPUT system of accounts like the 1947 interindustry study made by the Bureau of Labor Statistics is one of a general class of tools of economic analysis, usually described as systems of social accounting. There are several types of social accounting systems. No one system can be considered to represent the social accounting approach, nor can it be assumed that the characteristics of any particular system are, or should be, the characteristics of all social accounting systems.

The interindustry study has many facets other than the establishment of a set of social accounts. This is also true of other systems of social accounting. This paper is not concerned with all the aspects of the study. Its purpose is to compare and contrast some of the characteristics of the input-output system as a structure of social accounting with those of two other systems of social accounting—national income and moneyflows.

The comparisons to be made in this paper involve all three systems. The relations between input-output and income and product systems are also dealt with in Herman I. Liebling's paper, "Interindustry Economics and National Income Theory."

It should be noted that the comparisons are to be made among three specific systems of accounts. There is a great temptation, in discussing and comparing different social accounting systems, to deal only with hypothetical, idealized systems or to compare systems as they might have been developed, or as they should have been developed to satisfy some particular analytic purposes, rather than as they actually were developed. Comparisons of the various types of systems in the abstract are an essential part of the methodology

This paper is an adaptation and condensation of parts of an unpublished dissertation ("A Comparative Study of Three Social Accounting Systems: National Income, Input-Output, and Moneyflows") submitted to Harvard University. The author is a member of the staff of the Division of Research and Statistics of the Board of Governors of the Federal Reserve System. The views expressed in the paper are those of the author and do not necessarily reflect those of the Board or of the Division.

of social accounting. They are, however, of limited usefulness, unless accompanied by specific and detailed comparisons. No system can be considered to be fully defined until it has been implemented statistically. The form in which data are available, institutional factors that become apparent only when the social accountant is forced to fill in his cells, the thousands of individual decisions that must be made in the process of construction of a system—all have great influence on the final form and meaning of a structure. Factors such as these constitute real problems, and make detailed comparison and reconciliation between different systems both difficult and necessary. Comparison of idealized structures without relating them to systems as they exist in operation may well lead to misunderstanding and misuse of the actual structures. It is of major interest and importance, therefore, to have comparisons of systems as they actually stand and not as they might have been if different decisions had been made in their construction, or if there were no data problems, or if economic institutions were different or could be ignored.

There are, however, certain difficulties in exact identification of the specific systems under consideration. In the case of the national income and product system of social accounting, the problem is minor, since the structure of the official income and product accounts for the United States—that compiled by the Department of Commerce—is published. The national income system that will be discussed here is that represented by Tables II to VI, pages 148 and 149 of the *National Income Supplement, 1951, Survey of Current Business*. This system will be referred to as the national income, or income and product system, with the recognition that these terms do not exactly describe its contents and scope.

One possible source of confusion as to what is meant by the income and product system of accounts is the existence of two sets of tables in the national income supplements. This discussion, as well as the discussion in the 1951 income supplement, considers the social accounting system to be presented in the Roman-numeraled tables. The supporting and detailed Arabic-numeraled tables do not constitute a social accounting system in the same sense.[1]

The input-output system for 1947, in contrast to the national in-

[1] Despite the wealth of information and detail presented in these tables, they do not, with one exception, provide all the information necessary to effect any finer sectoring than is presented in the Roman-numeraled tables. The one exception is the government sector, where federal and state and local subsectors can be drawn up, but even in this case a few minor pieces of information needed for the subsectoring are not provided in the tables as published.

come system, was in a rather unsettled state up to the time of this Conference. The system, as presented in the latest publication of description and figures[2] prior to this Conference, was to a great extent in a preliminary stage, and it has been changed in many respects since. Moreover, the system has considerable flexibility, with organization, coverage, detail, etc., often varying with the analytic requirements of specific problems. This means that there may be more than a single structure of accounts in existence and still more in potential existence. These circumstances can make it very difficult, particularly for an outsider, to make comparisons or observations. Such an observer always runs the risk that what he says may have been true at an earlier stage of development but is not true now, or is only true for the purposes of some specific piece of analysis. Despite this risk, it is most efficient for purposes of meaningful comparison to adhere to one version of the system. This discussion centers on the version presented in the article, "The Interindustry Relations Study for 1947,"[3] as amended by certain specific changes made since its appearance. This published version will be referred to as the *Review* version.

In the case of moneyflows, there are two specific systems. One, constructed by Morris A. Copeland, covering the years 1936 through 1942, has recently appeared in book form.[4] The other version of the system, while consistent with the earlier exploration in spirit, differs in certain structural characteristics from the original system. The second version, which was developed in the Division of Research and Statistics of the Board of Governors of the Federal Reserve System, was originally given only limited circulation in a mimeographed report dated September 1951[5] and has since been presented, in a revised form and with an expanded description, in *Flow of Funds in the United States, 1939-1953*, published by the Board of Governors.[5a] It is this second version of the system that will be used in the comparisons in this paper. For the kinds of comparisons to be made here, there are few significant differences be-

[2] W. Duane Evans and Marvin Hoffenberg, "The Interindustry Relations Study for 1947," *The Review of Economics and Statistics*, May 1952, pp. 97-143.

[3] *Ibid.*

[4] Morris A. Copeland, *A Study of Moneyflows in the United States*, National Bureau of Economic Research, 1952.

[5] Board of Governors of the Federal Reserve System, "Progress Report on the Moneyflows Study," prepared by Daniel H. Brill *et al.*, mimeographed, 1951.

[5a] Board of Governors of the Federal Reserve System, *Flow of Funds in the United States, 1939-1953*, prepared by Daniel H. Brill, Stanley J. Sigel, *et al.*, Washington, 1955.

tween the structure of the *Progress Report* and that published in *Flow of Funds.*

In the published version developed by the Board's Division of Research and Statistics and in current work with the structure of accounts, the name of the system has been changed from "money-flows" to "flow of funds." Since this paper was written and presented to the Conference before the change in name, the term "money-flows," current at that time, has been used throughout the paper to refer to this system of accounts.

These three systems—national income, input-output, and money-flows—present different perspectives of the economy. No one of them presents a complete picture. Each of them can be used for analytic purposes for which the others are inadequate. Other papers in the Conference indicate the wide range of analytic problems to which the input-output approach is adaptable. No one of the systems—nor all three combined—provides a framework appropriate for the analysis of the whole range of economic problems. However, an integration of economic analysis that would successfully combine these three perspectives would be a step forward in economics. No such integration is possible on a rigorous or internally consistent basis without a knowledge of the relations and differences among the three comprehensive systems we now have, and without the ability to shift or to translate from one perspective to another, from one system to another. This paper is intended to contribute to an understanding of some of the problems involved in attempts to achieve integrated analysis.

There are various ways in which social accounting systems can differ. The areas of comparison that will be dealt with in this paper center around differences in orientation, type of accounting structure, transactions coverage, and sectoring. These are not independent characteristics. Differences in orientation explain differences in decisions as to transactions coverage and sectoring; in turn, the specific elements of the structure often determine the orientation. Transactions decisions and sectoring decisions are not made independently; indeed, it is often difficult to distinguish between them. Nevertheless, it is convenient to discuss these characteristics as separately as possible, taking cognizance of the interrelations.

B. Orientation

The three systems differ markedly with respect to general orientations—that is, with respect to the general aspects of the economy on

which the systems focus, and the general analytic purposes for which they are appropriate. As used in this sense, the orientation of a social accounting system is related to several factors, such as its original purpose, appropriate analytic uses, etc. The original purpose, however, is not always a controlling element in the ultimate orientation of a statistically implemented system. The structural characteristics may determine the orientation as well as the orientation determining the structure. Once a social accounting system is brought into existence, it tends to lead a life of its own, with its development often determined by the logic of its own requirements. The completed structure may deviate from the requirements of its original purpose in many respects. This has been particularly true in the history of the development of national income measures and systems. Nor can the orientation always be identified too closely with the analytic uses to which a system is put. There are too many instances of improper and inappropriate uses to justify the taking of actual uses as the sole criterion of orientation. Furthermore, there may not be a single orientation applicable to all elements of a system. Fully completed systems like the ones under discussion here are extremely complex organizations containing many diverse elements. This diversity is partly the result of a tendency to make systems as comprehensive as possible and to include many items, some of which are provision for present or future analytic extension of the structure, which are extraneous to any specific orientation. Moreover, these divergent elements may come about not only through choice, but also through accidents of data availability and methods of construction.

Despite all these qualifications, there still exists for each of these systems some general differentiating perspective of the economy, some focusing on certain aspects of the economy—in short, some orientation in terms of which many of the individual decisions made in the construction of the systems are understandable or which dominates to a great extent the form of the structure.

1. INCOME AND PRODUCT SYSTEM

In the case of the national income accounts, the orientation centers around the measurement (at market prices) of values created in current productive activity and the distribution of claims on, or rights in, these newly created values among parties to the productive activity. Such distribution includes, to some extent, the redistribution of these rights from those to whom they originally accrue to

other groups in the economy. The accounts also focus on the purchase by various groups in the economy of final product embodying the values added in the productive activity.

Such measurement of income and production has an essential welfare aspect. The totals have important theoretical meaning. Activities are distinguished as to whether or not they are "productive." Expenditures are distinguished as to whether they represent an allocation of the fruits of production or represent costs of achieving production. Comparability over space and time is sought so as to make possible a value judgment of the performance of the economy.

However, the income and product system is not always (or even mainly) used for problems involving performance in a welfare sense. Of the three systems it can least adequately be described in terms of any single general orientation. In its construction there is a recognition that an income and product orientation and transaction coverage, strictly and narrowly conceived, are not enough for all purposes of analysis. This has influenced the form and contents of the accounts, which are broader than national income and product. The added coverage is typified by the inclusion of transfer payments. Despite the addenda, however, the individual transaction and sectoring decisions, which give the system of accounts its differentiating characteristics, are greatly influenced by the national income and product orientation.

2. INPUT-OUTPUT SYSTEM

The input-output accounts, like the national income accounts, are concerned with current productive activity and with performance. The focus of the system is, however, quite different. These accounts are designed to deal with the general problem of interindustry relations at a production level. The orientation is toward technological relations between physical inputs and physical outputs in the productive process. For each industry the important question is the amount purchased from other industries in relation to its own production, and the allocation of its output to other industries and sectors. The interest is in total production of each industry rather than in the final product of the economy as a whole. The distribution of output to the final demand areas is necessary for the full accounting of all output and for the completion of the accounts, but it is of special interest only in that it aids in establishing bills of goods in terms of which interindustry analyses are carried on.

3. MONEYFLOWS SYSTEM

The focus of the moneyflows structure of accounts is on all transactions involving the use of money and credit; on the financial relations between the various parts of the economy; on the relations between financial and nonfinancial transactions, including the role of the money and credit mechanism in the productive process, and the problems and patterns of financing nonfinancial transactions. Essentially, it is viewing the economy as a monetary, credit, and financial economy as well as a goods-producing and goods-purchasing economy.

Since these three perspectives all pertain to the same economy, the systems are obviously related. For a great many transactions they will overlap or coincide. In other cases the connections will be tenuous and difficult to establish. Thus, most of the transactions in the input-output system and in the income and product accounts are effected through the use of money or credit, and therefore appear in some form in the moneyflows accounts. The income and product totals and the accounts from which they are derived can be viewed as being roughly equivalent to certain entries and subtotals of the input-output accounts. On the other hand, each of the systems, in addition to its overlaps with the other systems, contains transactions not found in the others.

Despite the overlaps, the orientations of the three systems are basically different. Thus, the area of major input-output interest—the relations between domestic industries—is consolidated out of the national income structure. Moneyflows contains no information on the productive relations among various industries, nor does it readily reveal the amount of production of goods and services achieved by the economy. Neither the input-output nor the national income accounts contain any recording of, or information on, financing, nor does either system show any relationships between monetary and credit flows and purchases of goods and services, all of which are part of the major focus of moneyflows. These differences in orientation are basic to an understanding of most of the differences in structure.

C. Type of Accounting Structure

Under the general heading of type of accounting structure, the systems will be compared with respect to the double-entry nature and the accrual aspects of their structures.

1. DOUBLE-ENTRY RECORDING

It is commonplace to describe social accounting systems as constituting double-entry accounting systems. In the case of input-output and national income, what is meant by this is that for every purchase a corresponding sale is shown or implied; for every income payment a corresponding income receipt is shown or implied, etc. This use of the term "double entry" has reference to the recording of the purchase and sale entries of the transaction on the books of the two parties to the transaction. There is *one* entry for *each* party. This, however, is not the customary meaning of double entry in accounting, where the "double" refers to *two* entries on the books of *each* party.

The complete recording of most transactions requires four entries. For example, in the case of a purchase for cash, the purchaser shows a debit for the purchase and a credit for the drawing down of cash balance, while the seller shows a credit for the sale and a debit for the building up of cash balance. The essence of double-entry bookkeeping for the individual firm consists in having every transaction in which the firm engages reflected in a debit to some account and an equal credit to some other account. The debits and credits are balancing within the framework of the individual firm (or transactor, to revert to the terminology of social accounting). There is no reference to, or connection with, the way these same transactions may be recorded elsewhere in the accounts of other transactors.

On the other hand, the essence of the present general use of the term double entry to describe social accounting systems consists in having every transaction included in the coverage of the system reflected in a debit to some account of one party to the transaction and an equal credit to some account of the other party to the transaction. In this usage, the debits and credits are balancing within the framework of the entire economy. There is no reference to the way the transactions are recorded within the accounts of any individual transactor. In particular, the accounts of each of the transactors may be on a single-entry basis.

This terminological usage, so far as social accounting is concerned, is ambiguous and unsatisfactory. It tends to mask, in inadequate terminology, substantive differences between different systems of social accounting. The same term—double entry—is applied to systems in which the individual transactors and sectors are on a single-entry basis as well as to those in which they are on a double-entry basis.

This could be handled by using the terms double entry and quadruple entry to distinguish between systems. However, this terminology is needlessly cumbersome. A social accounting system by its very nature records at least two entries for every transaction. There is no loss of meaning, therefore, in using the terms single entry and double entry in reference to social accounting systems with the same meaning they have for the individual transactors. Thus, a single-entry social accounting system is one in which the transactions are recorded on a single-entry basis for each transactor; and a double-entry social accounting system is one in which the transactions are recorded on a double-entry basis for each transactor. In these terms, moneyflows is on a double-entry basis and the other two systems are on a single-entry basis.[6]

This distinction between the three systems is important, since it is closely related to the orientations already discussed and to the transactions coverage to be discussed later. Most transactions have a double nature—something is exchanged for something else. For example, goods are exchanged against money. A single-entry system abstracts from half the exchange involved in the transactions it covers. It may record only the flows of goods and not the means of payment. A double-entry system records both sides of the transactions for each transactor. Since our economy, in general, is not a barter economy, this type of recording inevitably requires and is associated with the recording of monetary and credit flows. Moneyflows, focusing in part on such flows, is inevitably on a double-entry basis. National income and input-output, having excluded from their scope the monetary and financial aspects of the transactions they cover, have no need for being on a double-entry basis. Conversely, being on a single-entry basis, they cannot, in their present form, be

[6] It should be noted that, by itself, the fact of balance in sector accounts in a system has no bearing on whether or not the sectors are single-entry or double-entry. Both single-entry and double-entry systems show balancing sector accounts. However, in single-entry recording there is no mechanism by which the specifically recorded credits and debits of a given transaction will be equal for any given sector. The credits and debits of a sector can be made equal by taking the difference between them and entering this as a balancing transaction. Thus, the sector accounts in input-output and in national income are balanced only by the introduction of residual transactions. In double-entry recording, on the other hand, conceptually, balance is provided automatically, since each transaction is reflected in each transactor statement in both a credit and a debit entry. Statistically, a double-entry system may contain *residual calculations* as part of the measurement of specific transactions, but these do not constitute *residual transactions*.

used rigorously or efficiently in analyses of monetary, credit, or financing aspects of the economy.

2. ACCRUALS

The subject of accruals is a central one in all forms of accounting. This is not the place for an exhaustive treatment of the subject in relation to social accounting systems. All that will be stressed here are certain differentiating characteristics of the ways in which the three systems record various transactions.

Social accounting systems vary in the extent to which they can be said to be on an accrual basis or in the extent to which the transactions they cover are on an accrual basis. All three systems discussed here contain items on both bases, and no generalization to the effect that some of the systems are accrual and others are non-accrual is valid. It is more profitable to examine the treatments of specific transactions to reach some impression of the relative importance of accruals in the three systems than it is to attempt judgments on the systems as a whole.

There is no question that, with respect both to orientation and to the treatment of specific transactions, input-output and national income have more accrual aspects than does moneyflows. The differences should not be exaggerated, however, particularly since they are for the most part reducible to certain specific differences in treatment and coverage.

There are several aspects to the accrual nature (or lack of it) of transactions covered in a system. Most of them refer to the timing with which transactions are recorded. Thus, one definition of accrual basis is "the method of keeping accounts which shows expenses incurred and income earned for a given period, although such expenses and income may not have been actually paid or received in cash." This definition stresses a contrast with the timing of bookkeeping entries in cash accounting. Thus, accrual accounting does not record purchases when cash payment is made but when the purchase is made or when the goods purchased are used up in production; it does not record sales when cash payment is received but when the sale is made or the income earned, etc. Capital expenditures enter costs not when the purchase is made but (roughly) as they contribute to production, etc.

Another aspect of accrual recording of transactions is the recognition of the existence of claims by and against parties to the transaction. If a transfer of value occurs at a time different from that of

the payment in cash, one of the parties to the transaction has incurred a debt and the other has acquired an asset.

National income as a concept is definitely of an accrual nature, being a sort of national cost accounting. The orientation is thus specifically accrual. However, the system of accounts does not always conform to this orientation. In particular, while the business sector account is, in general and in intent, on an accrual basis, the personal and government sectors contain several transactions on a nonaccrual basis. Thus, it is not possible to describe the entire system as accrual despite the accrual nature of the income and product concept.

Input-output, similarly, is conceptually on an accrual basis. The basic orientation requires the timing of transactions in goods and services as they are used in production, not as they are paid for. However, input-output, like the income accounts, contains in its final area many transactions that are not on an accrual basis.

Moneyflows is not an accrual system in the sense that the other two are, but there is nothing in the general moneyflow orientation or in the specific methods of construction of the system that prevents the recording of many transactions on an accrual basis, or that makes such transactions inappropriate for inclusion in the system, provided that the transaction qualifies for inclusion on other grounds, e.g. that it involves two separate transactors.[7] Moneyflows is not a cash accounting system but a cash and credit system. All that is required for moneyflows to record certain transactions on an accrual basis is that the asset/debt relationship arising out of the accrual recording be also recorded in the system. In fact, if such debts are handled in moneyflows as, for example, trade debts incurred in the purchase of goods and services are handled, it is necessary for moneyflows to handle the corresponding transactions on an accrual basis. The various moneyflow transaction categories differ with respect to their accrual nature. This means that some, but not all, of the credit/debt relationships arising out of the accrual accounting are handled in moneyflows. The treatments in individual cases are as much the result of specific analytic decisions as they are of the requirements of the general orientation.

The contrast between the accrual systems, which contain many transactions on a nonaccrual basis, and the nonaccrual system, which contains many transactions on an accrual basis, is indicated by an examination of the treatment of some specific types of transactions

[7] See discussion, pp. 266ff.

with respect to the timing basis on which they are recorded in the three systems.

Interest is recorded in the national income system on a mixed basis. Private interest, in general, is recorded on an accrued basis, and government interest contains elements of both accrual and payments timing. In the *Progress Report* version, interest on all government savings bonds was shown on a paid rather than an accrued basis, but in the latest version of the system, interest on savings bonds and Treasury bills is on an accrual basis. The input-output system shows no payment of interest by its households, and in the *Review* version showed no explicit interest payments by any private sector. The interest payments are implicitly in the over-all residual paid to households. In subsequent development of the system, however, business interest payments are shown explicitly and on a timing basis comparable to that in the national income accounts.

Moneyflows records all taxes—personal and business, direct and indirect—on the basis of payments or receipts, whereas both input-output and national income record indirect business taxes, employer contributions to social security, and corporate profits taxes on an accrued liability basis.

Input-output shows non-life-insurance premiums on an earned premium basis. Moneyflows records them on a payment basis. They enter national income calculations on a payment basis for consumers and an earned premium basis for businesses.

Most of the purchases of goods and services are on approximately the same basis in all three systems. The bases used—shipments, transfer of title, time of purchase—are not identical but are fairly close, and usually stand in contrast to a time-of-payment basis.

A major exception to this similarity of timing occurs in the case of transactions affected by renegotiations of war contracts. In the national income accounts, the term "accrual" covers the viewing of transactions not as they appeared to the participants at the time the transactions took place, but as they appeared well after the event, taking account of any subsequent events that might have any bearing on the transactions. While the most striking example of this is the treatment of renegotiations, there are other cases where similar adjustments are applied to profits, profit taxes, other accrued taxes, and a very minor part of wages and salaries.

In the case of renegotiations, more than one transaction is involved. A transaction involving the purchase of goods by the government takes place in certain specific terms. In later years, the

contract under which the original transaction took place is renegotiated and the terms of the original transaction are changed. Further transactions based on the renegotiation take place at the same time as the renegotiation or in subsequent years. The national income accounts record the transactions affected (sales, government purchases profits, profit tax liability) not in the original values in which they occurred but as adjusted for the effect of the subsequent renegotiation, and do not record any aspects of this complex in the year of the renegotiation itself. Moneyflows accounting records the original transaction and any transactions arising in connection with the renegotiation separately, in the values in which each originally occurs and at the time each occurs. This is not a difference that results because one system is accrual and the other not, for the moneyflow recording of the original transaction is on an accrual, not a cash, basis. Since there were no transactions in 1947 that were later renegotiated, input-output was not faced with this problem, but probably would, like the national income accounts, handle such transactions at the renegotiated values. Input-output, like national income, does not record any renegotiation payments occurring in 1947 that pertained to sales occurring in earlier years.

There are some accrual transactions that moneyflows does not record at all. The moneyflows system, oriented toward transactions effected through the use of money and credit, records only those that take place between separate transactors. It excludes transactions in which only a single transactor is involved, which represents bookkeeping entries between different accounts of a single transactor. Moneyflows, in effect, consolidates out transactions within firms. But such internal transactions are a necessary part of full accrual accounting. Many of the items going into the calculation of profits, such as depreciation, and indeed the recording of profits itself, are internal transactions of this nature. Thus, moneyflows does not record certain costs like depreciation,[8] nor does it show profits

[8] The question often arises as to whether moneyflows includes or excludes depreciation. This can be roughly answered by saying that depreciation, as an internal transaction between the current and capital accounts of the same transactor, is consolidated out as a transaction. This does not mean that a source of funds has been neglected. The usual sources and uses of funds statement includes profits and depreciation as sources. Since profits are net of depreciation, this means that depreciation is shown twice—once as a negative source, in the calculation of profits, and again as a positive source to balance the first. Since moneyflows never shows depreciation as a use of funds (or as a negative source), it is not necessary to show it as a source of funds. It is not so much that moneyflows excludes depreciation, then, as it is that, never having deducted it, it does not have to add it back in.

as such, though this is the result partly of recording transactions gross rather than net, as well as of not recording internal transactions. On the other hand, national income does, indeed must, record these internal bookkeeping accrual entries as specific transactions. The *Review* version of input-output does not explicitly record these internal transactions. They are, however, implicitly covered in the residual transaction of each processing sector and are explicitly calculated in subsequent development of the system.

One important aspect of accrual accounting is a distinction between capital outlays and current costs. Capital goods enter accrual cost records only as used up in production and not when purchased or paid for. All three systems record capital outlays, including inventory change, in the period purchased, and all three show them separately from current outlays. The separate showing of capital outlays in moneyflows involves some conceptual problems for that system, particularly with respect to inventory change. Input-output and national income show current cost outlays and capital outlays in separate sector accounts, and show all private capital expenditures as the outlays of a single sector account. Moneyflows records all the activities of any given institution in the same sector. It separates capital outlays and current outlays by identifying them in each sector account rather than by recording them in separate sector accounts.[9]

The transactions discussed above are not the only ones where decisions on timing and accrual nature are necessary and where differences between the systems exist. Without going through a catalogue of all pertinent transactions and decisions, it can be seen that the major areas of difference with respect to accrual accounting between moneyflows and the other systems boil down to items that represent intrafirm transactions, which moneyflows does not show and which the other systems do show. This difference is, however, an important one. The failure to record these internal transactions, particularly those relating to profits, restricts the range of analytic problems for which moneyflows system is appropriate without supplementary information from outside the structure.[9a]

D. Transactions Coverage

The transactions coverage of the three systems, like the orientations, differ markedly. In all three cases, the names of the systems

[9] See discussion of institutional versus activity sectoring, pp. 275-278.

[9a] In the *Flow of Funds* version of the system, many of these internal transactions are shown as memoranda on the sector accounts.

are inadequate as indications of their scope or of the differences between them and should be considered merely as labels to identify them. Thus, the national income and product accounts contain many transfers of value that are not strictly national income and product transactions.

The input-output system also contains transactions, particularly within the final area, that do not partake of the technical productive aspects implied by the term input-output. On the other hand, the alternate terms "interindustry relations" or "interindustry study" are much broader than the actual coverage, since not all economic relations between industries are covered in input-output, and in fact not all are wanted. There are credit and financial relationships, relationships of ownership and control, and other relationships of importance in economic behavior and decision making that the input-output system does not handle in its present form.

The name "moneyflows" is probably even more ambiguous than the other two with respect to revealing the transactions coverage. One difficulty with the term is that it may seem to imply a cash accounting system. The coverage is, however, much wider. It is not a money system but a money and credit system. A second difficulty is that it seems to imply that the system is solely or primarily concerned with flows of money (or with flows of money and credit if the first difficulty is cleared up). But the transactions coverage of the moneyflows structure is not properly defined as flows of money and credit. The system covers all transactions effected through the use of money and credit, and the system records the flows of goods and services as well as the monetary and credit flows associated with the payment for the goods and services. Moneyflows is thus *not* contrasted to input-output and national income in that the latter systems record flows of goods and services and the former records flows of money and credit, but rather in that input-output and national income, being single-entry systems, record only one of the two flows of values involved in each transaction, whereas moneyflows, being a double-entry system, records both flows of values.

Moneyflows covers, and the other two systems do not, purchases and sales of existing assets and used goods, transactions in financial claims, borrowing and lending, and repayment of debt.

Input-output and national income, on the other hand, include transactions not covered by moneyflows. Thus, as has already been discussed in the previous section, moneyflows records only transactions taking place between different institutional entities and does

not cover internal transactions. Such internal transactions are an important conceptual part of the calculations of input-output and national income. Similarly, moneyflows excludes transactions in kind. Such a distinction between transactions on the basis of form of payment is, however, foreign to both input-output and national income. The in-kind transactions of these two systems are a source of difference between them and moneyflows. In addition, the coverage of in-kind transactions is different as between input-output and national income.

1. IMPUTED TRANSACTIONS

An imputed transaction is one that either did not actually occur, did not occur in the form recorded, or did not occur between the transactors or sectors for whom it is recorded. The existence and the extent of imputations in any system are related fairly closely to the general purposes and orientation of the system. The analytic uses to which the system is to be put, or the aspects of economic life that it is intended to portray, are often inadequately served by the form in which transactions actually take place. The essential meaning of the economy for a particular purpose may be better revealed by an organized recording of economic events different from that actually recorded in the market place.

The systems differ with respect to the use of imputations. Moneyflows, in general, records only transactions that actually occur and in the form in which they occur; it does not use imputations.[10] On the other hand, imputed transactions play a large role in input-output and in national income, though their use is more extensive in the former than in the latter.

The imputations in national income are designed to permit the striking of significant totals of final output and of income—totals that are not dependent upon the particular institutional form taken by the actual transactions; totals in which comparisons over time and over space are not influenced by shifts in the institutional form of the transaction.

The most important imputations in the national income accounts have to do with the treatment of owner-occupied housing, interest flows, services provided by financial intermediaries, international unilateral transfers, and gold flows.

In the case of input-output, the important imputations result from

[10] There are a few minor exceptions that serve to simplify the recording of withholding taxes and insurance agents' commissions.

the combination of the general orientation of identifying and studying interindustry flows and the analytic necessity of deriving stable input coefficients. Imputed transactions are used to reduce the possibility of input coefficient instabilities arising out of the fact that the same product might be produced in several industries and that the purchasing industry might shift its sources of supply from one industry to another. Thus, wherever possible, secondary products of each industry are transferred through an imputed sale to the industry in which the product is the primary product.[11] The industries using any given product in production are shown as purchasing it from only one industry—that industry for which the product is the primary product. Transactions involving competitive imports are similarly imputed through the corresponding domestic producing industry.[11] Thus, in order to make the system more meaningful for certain specific analytic purposes, the relations actually existing between various transactors are distorted.

The treatment of certain government expenditures also involves imputations not present in the national income accounts. Government provides certain services to the community that are also available for sale by private industry. It is often considered desirable in input-output analysis to have, insofar as possible, the total production of any one good or service sectored in a single industry, or at least passing through a single industry. When services are sold to the public on an approximately commercial basis by a government agency specifically organized to conduct a commercial operation, the problem can be handled by a sectoring decision. The government corporation is shifted from the government sector to the appropriate industry sector. Where there is no specific sale of the service, however, the situation is more complicated and has been handled by imputations. For example, in the case of public education and public hospitals, these activities of the government are resectored to the corresponding private industry. All the costs are considered to be borne by the private industry, e.g. government wages and salaries for education and hospital services are shown as paid not by the government but by the industry. Matching this shift, there is an imputed purchase by the government of education and hospital services from private industry equal to the cost items no longer shown as purchased directly by the government. The same sort of imputation is resorted to in the case of force account construction and maintenance.

[11] Such imputations are called "transfers" in the BLS Interindustry Economics Division work and writings.

It should be noted that these two types of solution—one involving just sectoring of government enterprises, the other, sectoring of government activities or programs plus imputed transactions—have different effects on the government account. In the former case, government totals are changed—a whole subsector is removed; in the latter, the total of government expenditures is not changed but its composition is. Purchase of a service from industry replaces purchases of other types of goods, wages and salaries, etc. Significant for a comparison with natural income accounts is the fact that the latter treatment does not change government purchases of GNP, but it does affect the distribution of these as between income originating and purchases from business, and at the same time, it changes the composition of income originating as between government and private business.

There are numerous other imputations in the input-output system. They arise in connection with sectoring on an establishment basis, the treatments of trade, distribution costs and indirect taxes, inventories, dividends, interest, rent, insurance benefits, etc. The input-output accounts also contain some of the imputations that appear in the national income accounts, although the calculations are not always the same.

Thus, imputations arise in input-output and national income accounts when the actual transactions of the economy are not appropriate for one reason or another, for the basic aims of the system. The orientation of moneyflows, however, is to record and analyze all transactions effected through the use of money and credit. Moneyflows is interested in the transactions that actually occur in the market, in the form in which they occur, and between whom they occur. Imputations, which are departures from the actual institutional transactions, are thus not only unnecessary in moneyflows but may be inappropriate.

2. NET VERSUS GROSS

In the construction of any system, decisions must be made with respect to the recording of transactions on a net or a gross basis. The three systems under discussion vary with respect to the extent of netting, the items netted, the reasons for netting, and the effects of this on the accounts. In general, both input-output and moneyflows (with respect to nonfinancial transactions) record transactions gross, while in national income there is extensive and widespread netting.

Input-output is oriented toward gross transactions, insofar as

netting conceals or distorts the flows considered necessary to the establishment of significant input coefficients. Where this is not at stake, as for example in the final demand area of the matrix, netting sometimes appears.

Moneyflows, focusing on all market transactions, is presented on as gross a basis as possible. In the nonfinancial transactions, there are two serious lapses from a gross basis (both the result of data deficiencies)—proprietors' withdrawals are presented net of proprietors' investment of funds, and for some sectors sales of realty are net of purchases. In contrast to the recording of nonfinancial transactions, the financial transactions are recorded on a net change basis rather than on a gross flows basis. The problems of net and gross in the case of financial flows are quite different than in the case of nonfinancial flows. The choice here is not really between gross and net flows but between various degrees of netness. It would probably be neither possible nor desirable to have financial flows on a completely gross basis. The optimum extent of grossing varies from item to item with the analytic use to which the system is being put and with the availability of data. Moreover, in financial flows, what is considered gross and what net depends on the fineness of breakdown among the financial transactions categories and the fineness of sector breakdown. However, there are transactions, e.g. mortgage debt, where a greater degree of grossing than is now presented would be both desirable and possible. In other cases, such as currency and deposits, there is probably less value to grossing.

Despite the fact that the income and product system contains more than national income and product transactions strictly defined, many of the structural characteristics are nevertheless dominated to a great extent by income and product considerations. Much of the extensive netting in the structure is related to this, in that gross flows, no matter how interesting or significant in themselves, are netted if the major income and product concepts to which they pertain are on a net basis. The structure of accounts shows little that is not required for the major aggregates. Moreover, the sector accounts are so set up that the credit and debit totals of each account can be related simply to the income and product concepts with a minimum of further calculation. Thus, instead of showing gross transactions in the accounting system, which could then be netted for the calculation of significant income and product totals, the netting is performed for the accounts themselves.

There are various ways in which transactions can be netted. Con-

solidation is one form of netting. The most striking difference between input-output and national income is that the whole major area of interest in input-output—the transactions between processing industries—is suppressed in the national income consolidation of its business sector. Moreover, each of the input-output processing sectors is presented on an unconsolidated basis.

All the income and product sectors are on a consolidated basis. In a few instances, the consolidations are not performed. In the personal and government sectors, transactions are not consolidated if such consolidation would have the effect of suppressing income-originating and final-product purchasing transactions, and would thus affect income and product totals. Outside of the processing area, input-output generally follows the national income practice. The consolidation is a little haphazard, however. For example, the input-output treatment of interest records all interest as being paid to households regardless of who actually receives it. Payments of interest by households, regardless of the recipient, are suppressed in input-output on the grounds that they are intrahousehold transactions. On the other hand, household payments of cash wages to other households are not suppressed, but are shown gross.

The moneyflow sector accounts are less consolidated than those of the other systems. In addition to showing intrabusiness transactions gross, as does input-output, moneyflows also records many of the other intrasector transactions that are suppressed in national income and input-output consolidation. Thus, transfers between persons, and between persons and nonprofit organizations (wherever there are any statistical bases for making such estimates), and between federal and state and local governmental units are recorded in moneyflows. While moneyflows, as a rule, does not consolidate the transactions between different transactors in a sector, it does, as discussed earlier, consolidate the internal transactions between the accounts of any single transactor. The federal government is considered to be a single transactor in the system, and the federal government sector thus appears as a consolidated sector. This consolidation is performed for all transactions of the sector, in contrast to the treatment in the government sectors of national income and input-output, where government contributions as employer to trust funds are shown unconsolidated in order to preserve certain totals.

The moneyflow banking and monetary fund sector is also a consolidated sector. This consolidation serves the analytic function of focusing on the relations of the monetary mechanism of the economy

as a whole with all other sectors. This consolidation affects only financial transactions, and thus is not a factor in comparisons with input-output and natural income. The subsectors, which are consolidated together in the full banking sector statements, are also presented separately on an unconsolidated basis.

There are numerous nettings in the national income accounts in addition to those involved in consolidation. For example, all three systems show a consolidated rest-of-the-world account—that is, transactions between foreigners are not shown. In addition to this, however, national income shows transactions of the rest of the world with the domestic economy on a net basis. Input-output records factor payments and cash unilaterals net and other transactions gross. Moneyflows records all these nonfinancial transactions with the rest of the world on a gross basis.

3. TO-WHOM FROM-WHOM IDENTIFICATION

One other major characteristic in terms of which the systems differ is the extent of the to-whom from-whom identification of transactions, i.e. the classification of each transaction in each sector account by the other sector that is party to the transaction. Such identification is, of course, a major characteristic of the input-output system, and one closely associated with its development as a powerful tool of economic analysis.

It is possible to show a formal to-whom from-whom identification for the national income system, but it is not of great significance because of the small number of sectors and the extensive netting in the accounts. Except in special circumstances, netting prevents a true to-whom from-whom identification.

The moneyflow accounts are not, in general, on a to-whom from-whom basis. It is possible, however, to identify the to-whom from-whom flows for many of the nonfinancial transaction categories from information on the work sheets. The following transaction types can be fully allocated with respect to to-whom from-whom identification: payrolls, insurance benefits, insurance premiums, taxes, tax refunds, grants and donations, and proprietors' withdrawals. In the main, rents and dividends can be so allocated. For the following transactions little could be accomplished along this line: interest, net real estate transfers, and other purchases of goods and services. The last item listed is, in general, the area of input-output focus and major to-whom from-whom identification. Where input-output

achieves a high degree of such identification, moneyflows achieves none.

With respect to financial transactions in moneyflows, the problem of to-whom from-whom flows is more complicated. For one thing, the transactions are presented net. While to-whom from-whom identification of financial flows is difficult, there is, for most of the financial transactions categories, one type of identification that can be made. This is the identification, for each sector holding an asset, of the sector having the liability; and for each sector having a liability, of the sector holding the asset. This identification is always possible, in general, in cases where there is either only one sector holding the asset or only one sector owing the liability. It is also possible to a more limited extent in other cases. Many of the financial transaction categories are in terms of a single sector's assets or a single sector's liabilities. A few, the most important of which is corporate and other securities, are the liability *and* the asset of more than one sector. For corporate and other securities, this creditor-debtor identification, in general, is not possible at the present time.

This type of sector identification of asset-debt relationship must not be confused with a to-whom from-whom identification of financial transactions. For, even though only one sector has the liability, say in the case of federal obligations, that does not mean that only that sector is selling the securities. Most of the claims treated in the system are negotiable claims. At any given time, the purchaser is not necessarily buying them from the sector bearing the liability; they might be purchased from any of the sectors holding the asset. Moreover, even if there were net changes in only two sectors, that does not imply that a transaction took place between them. For example, an increase in bank holdings of consumer debt does not necessarily imply a transaction between the consumer and the banking sectors. The consumer sector may have incurred debt to the corporate sector, which sold the debt to the banking sector, etc. Examples of this kind can be multiplied for most types of financial transaction.

The debtor-creditor identification that can be achieved is important for analysis. This type of identification does not necessarily reveal the pattern of the channels through which funds flow and financial claims are distributed. In general, then, it should not be considered to be, or used as if it were, to-whom from-whom information on the transactions covered. However, the lack of such precise to-whom from-whom financial information is significant only when

the intermediate steps in the patterns of financial flows are analytically important. The debtor-creditor identification is sufficient for many analytic purposes.

E. Sectoring

In addition to differences in transactions coverage of the three systems, there are also differences with respect to the grouping of transactors into sectors and with respect to the nature and characteristics of the transactors themselves. These differences in sectoring are related, to a great extent, to differences in orientation. More than differences in transaction type, differences in transactor and in sector type are a major barrier to easy shifting and quick translation from one system to another.

1. INSTITUTIONAL VERSUS ACTIVITY SECTORING

The systems differ in the extent to which their sectoring can be characterized as being on an institutional or on an activity basis. Moneyflows sectoring is, in general, on an institutional basis, i.e. with a few exceptions it groups all the recorded activities of any economic unit or institution into the same sector. Input-output and national income sectorings, on the other hand, are on an activity basis, i.e. different activities of the same economic unit or institution are placed in different sectors.[12] Their sectors isolate activities rather than economic units.

These differences with respect to the question of institutional sectoring are related to differences in orientation. In national income there is a sharp distinction between the various activities of a given economic unit that is basic to the meaning and purpose of the whole structure. Business-type cost transactions representing productive activity play a role in national income different from that of transactions representing the final taking of the values produced. A distinction between such activities is necessary if proper income and product totals are to be built up. With such an emphasis, it is only natural that the activities that do differ in their contribution to the various income and product concepts should be grouped into different sectors.

Thus, the national income business sector consists of current business-type productive activities of practically all groups in the economy. It includes not only such current activities of business firms but also those of government enterprises and the home-owning and

[12] The interindustry study uses the terms "activity" and "activity sectoring" in a narrower (but related) sense.

maintaining activities of homeowners. On the other hand, it excludes from this sector all the investment activities of these units. These activities are recorded in other sectors, mainly in the saving-and-investment sector; similarly with the other sectors. However, grouping by activities rather than by institutions, while consistent with and encouraged by the income and product orientation, is not required by it. In fact, the income and product system does not completely separate the activities, as is indicated by the presence of income-originating transactions in the final sectors.

In input-output there is also a sharp focus on activities rather than on institutions. The emphasis here is on activities for which stable relations can be established between the pattern of inputs and outputs. None of the processing sectors contains the investment activities entered into by the transactors in that group. Home-owning activities are separated from persons and treated as part of the rental industry sectors, etc. Since the emphasis is on production relations, certain activities of productive enterprises not considered to be directly related to its main productive activities are separated from the business sectors. Such activities as receiving dividends, interest, and insurance benefits are excluded from the processing industries and made part of households. Similarly, the activity of receiving rent is concentrated in the rental industry regardless of what firms receive the rents and where their other activities are classified.

The moneyflows sectoring, on the other hand, attempts to present the transactions of complete units and to avoid, where possible, the dispersing of the various activities of a unit among several sectors. Thus, the moneyflows business sectors contain all the covered activities, investment as well as current, of the business firms included in the sectors. Its consumer sector covers all the activities of consumers, including, for example, home purchase and home operation and maintenance. Its government sectors cover all governmental operations, including those of government enterprises, etc.

The moneyflows system does not achieve complete institutional sectoring. Some aspects of the treatment of the banking sector constitute activity sectoring. The major deficiency in this regard, however, relates to proprietor-families. Moneyflows places the personal, consumer activities of proprietor-families in the consumer sector and their business activities in the noncorporate business sectors. For many proprietor-family complexes this probably constitutes a violation of the principle of institutional sectoring. But even aside from the almost insuperable data problems, it is by no means clear to what

extent this treatment does constitute activity sectoring. Is it universally true that the sole proprietorship and the proprietor's family are a single economic unit with two major activities—business and personal? The unincorporated partnership complicates the picture still more, as there is often a legal distinction between the business and the partners based on a partnership agreement. To say that, in all cases, unincorporated enterprises and their owners are a single economic institution with different activities is equivalent to declaring that the families of all the partners in a given enterprise are all part of a single economic unit—a viewpoint that would probably find little support from the families concerned.

Moneyflows and national income both separate the business and the household activities of the proprietor-families. The actual treatments in the two systems, however, have quite different analytic implications. National income, contrary to its treatment of corporate enterprise income, records the entire net accrued income of noncorporate enterprise as being paid to persons. In this treatment there is no saving (except for depreciation) done within noncorporate enterprises. The treatment implies that saving and investment decisions for the noncorporate enterprise are made in the household part of the proprietor-family complex.

The moneyflows treatment, on the other hand, recording withdrawals rather than total accrued income as the consumer receipt from noncorporate enterprise, allows the enterprise as well as the family to save. It implies that the saving and investment decisions for the enterprise are made within the context of the enterprise itself, and that in addition the household part of the complex can make saving decisions with respect to the funds it withdraws from the enterprise.

The relative analytic merit of these two treatments remains to be established. Present data deficiencies prevent a definitive resolution of this issue.

The issue of activity versus institutional sectoring is not solely related to general orientation or to technical considerations. There is also a more important issue of economic analysis. Other things being equal, systems with institutional sectoring are more appropriate for analyses in which it is considered that economic behavior can best be studied in reference to all the economic activities of an economic unit or institution; that such behavior is the result of decisions taken in the context of the entire economic environment of the economic units making the decisions (or for whom the de-

cisions are made); that the various decisions of any economic unit are mutually conditioning; that no single decision can be adequately explained out of the context of all the activities of each unit. Under the same conditions, double-entry social accounting systems are more appropriate than single-entry systems, since the former provide more of the economic context within which the decisions are made and more of the areas for which decisions are made.

Some economic decisions may not depend, in any important sense, on the entire economic environment of the transactor. They may, for example, follow semiautomatically from something outside the transactor's control (in the short-run at least) like a fixed (or relatively fixed) technological structure. Also, for some purposes of analysis it may be desirable to concentrate on the responses of different types of activity to a given set of stimuli rather than on the responses of different groups of institutions. In these cases, activity sectoring may be preferable.

2. FINAL SECTORS

The systems differ with respect to the presence of "final" sectors. In both the input-output and the national income systems, a distinction is made between final and nonfinal sectors, though the basis of the distinction is not quite the same in the two systems. In money-flows, there is no such distinction between sectors.

The national income final sectors and the final rows and columns of input-output bear a fairly close resemblance to one another. They are, however, far from being identical. The resemblance that exists should not obscure the fact that the nature of the difference between the final and nonfinal areas, and the criterion of allocation between final and nonfinal, are essentially different in the two systems. In national income there is a sharp distinction between the business or processing sector and the final sectors, based on the fact that activities of the two types of sector play distinctly different roles in the creation, flow, and distribution of income and product. This distinction is rooted deep in the theory of production and creation of values accepted by the national income analyst. The distinction is so sharp that the role and meaning of a given transaction, its contribution to, and its place in, the income and product totals depends upon what sector engages in it, and vice versa. Since the striking of significant totals is very important in income and product, such a distinction is fundamental to the system.

In input-output, on the other hand, the distinction that exists be-

tween the two groups of sectors variously called final, exogenous, autonomous, etc., on the one hand, and nonfinal, endogenous, processing, etc., on the other hand, have a much different analytic significance. The distinction in this case is between sectors for which a stable input-coefficient structure exists and those for which it is statistically or analytically impossible or unfeasible to establish a relationship between "output" and a pattern of "inputs." If it were possible to establish a pattern between the output and the inputs of some element in the final sector, say foreign trade, this element could be shifted from the final sector to the processing sectors with no great conceptual principle or decision being violated or changed. In national income, on the other hand, no functional relationship known or discoverable between income and expenditures for any component of the final sectors could possibly have the effect of changing the classification of that component from a final to an intermediate sector.

The contrast between the natures of national income and input-output final sectors can be illustrated by the difference in treatment of government enterprises in the two systems. Both systems exclude certain government enterprises and activities from the final area and classify them in the nonfinal area. National income shifts those that have commercial-type operations, whose expenditures are in the nature of costs of production rather than the collective purchasing of final product. Input-output, on the other hand, not being concerned with problems of the ultimate nature of the activity, shifts government activities on quite a different basis. In this system, the activities shifted are those for which it is possible to establish input relationships. In the present input-output study, the statistical basis for the establishment of such relationships depended upon the existence of a corresponding private industry. That is, government activities are shifted when there is a corresponding private sector, regardless of the nature of the activity. For example, income and product puts the Post Office and waterworks in the business sector because they are commercial-type activities, and input-output leaves them in the government account because there are no corresponding private sectors. Income and product puts public schools in the government sector because they represent a collective use of final product; and input-output puts them in the nonfinal area because there is a corresponding private sector.

Another example of this difference in the meaning of the final sectors in the two systems is the treatment of nonprofit organizations.

National income puts them in the consumer sector as a collective final activity; input-output has them in the processing area, not because of any difference in view as to their fundamental nature but because an input structure can be set up for them. Similarly, investment activities are excluded from the processing sectors of input-output, not because they involve noncurrent cost purchases but because there is no stable linear relation between the output and the investment inputs of any given industry in any given period of time.

In moneyflows, there are no differences between the sectors corresponding to a distinction between final and nonfinal sectors. Moneyflow sectoring is, in general, based on institutional characteristics. The sectors differ institutionally and differ with respect to their patterns of behavior, their patterns of sources and uses of funds. But there is nothing in the nature of any of the sectors that prevents it from containing and recording all the covered activities of all of its transactors. The treatment of transactions does not depend upon what sectors are party to the transaction. Nor are there any distinctions between sectors by virtue of their having (or not having) particular functional relationships between their various sources and uses of funds.

Moneyflows thus does not distinguish between final and nonfinal activities. Partly because of this, it is able to achieve a certain sharpness of sectoring. For example, in national income, private pension funds and nonprofit organizations are deemed to be collective agents of persons and hence part of the final area. They are included in the personal sector. Moneyflows, not sectoring in relation to the ultimate nature of these institutions, does not put them in its consumer sector. This sector is, to this extent, more homogeneous than the national income personal sector.

3. OTHER SECTORING DIFFERENCES

There are numerous other ways, many of which are related to basic differences in orientation and perspective, in which the sectoring decisions of the three systems vary. For example, the moneyflow orientation naturally leads to sectors that isolate the principal credit and monetary institutions. Thus, in moneyflows, the banking system is a separate sector with four subsectors—commercial banks, mutual savings banks and the Postal Savings System, Federal Reserve Banks, and Treasury monetary funds—also shown separately.[12a] It is separated from other financial and credit institutions because

[12a] The subsectoring in the earlier *Progress Report* was slightly different.

of the pattern of its financial transactions and its special role in the monetary mechanism. The banking sector includes all institutions that bear some liability for the nation's money supply, including the governmental accounts that hold reserves against the nation's currency. In a system dealing in transactions in financial assets and claims, it is analytically convenient, though not absolutely necessary, to have a single sector carry the liability for the money supply.

Life insurance companies also constitute a separate sector in moneyflows because they are an important part of the credit mechanism, and their institutional role in the financial structure of the economy with respect to their sources of funds, their uses of funds, and their legal and economic relations with other parts of the economy differs from that of other types of insurance companies and other financial institutions. Similarly, separate subsectors are set up for self-administered pension funds, other insurance companies, saving and loan associations, nonprofit organizations, and miscellaneous financial institutions.[12b]

Much of the sectoring that is perfectly natural or even mandatory in moneyflows has little or no significance in systems that do not cover financial transactions or the monetary and credit aspects of the transactions they do cover. The economic importance of financial institutions is not measured by their income and product transactions; in fact, their economic functions can not even be described in these terms. The national income system, with a single business sector, does not have such financial sectors, and it probably would not in any case, since financial institutions have such small participation in income originating and sales of final product.

In comparison with even the most detailed input-output sectoring, the moneyflow sectoring and subsectoring stands out in contrast, with its emphasis on institutions important in financing, credit, and monetary flows.[13]

[12b] These nonbank financial subsectors are shown grouped into two sectors in *Flow of Funds*: the three insurance subsectors in the insurance sector; and the others in the other investors sector. In the *Progress Report* this sector grouping was somewhat different.

[13] There is one respect in which the isolation of financial businesses is more complete in input-output than in moneyflows. Such transactors as investment companies, finance companies, brokers, security dealers, etc., which are all in the input-output banking and finance sector, in moneyflows are in the corporate and noncorporate business sectors. The sectoring in the original moneyflows system of Copeland provided for this particular financial-nonfinancial business separation, but it was dropped in the subsequent system because of the statistical difficulties of continuing the separation on a current basis.

Even in the 450-sector detail, the input-output system groups into a single sector all banks, credit agencies other than banks, security and commodity brokers, dealers, exchanges, and firms providing services to such institutions. In the 50-sector detail of the *Review* version, a single sector contains these banking and financial institutions plus insurance companies of all kinds. The goods and services transactions of these financial institutions are not sufficiently important to warrant separate treatment in input-output.

Another difference in sectoring has to do with legal forms of organization. Neither the input-output nor the national income system sectors by legal form of organization. The national income system of the Department of Commerce has, in the Arabic-numeraled tables of the presentations in *Survey of Current Business*, a great deal of detail, some of which provides corporate and noncorporate breaks of certain transaction categories. But subsidiary detail does not, by itself, constitute or provide the basis for further sectoring, unless there is comparable detail for all transaction categories. Despite all the industry and legal form of organization detail in the national income tables, there is still only a single business sector. Similarly, input-output work sheets contain some corporate/noncorporate information, but only for certain computational purposes, and not enough to provide full sectors. In moneyflows, on the other hand, the distinction between corporate and noncorporate enterprises and their allocation to separate sectors is an important sectoring characteristic, based in general on considerations of fundamental differences in financial patterns. This difference in treatment with respect to corporate and noncorporate status of transactors is one of the most important sectoring differences between input-output and moneyflows. It is one of the major barriers to a full to-whom from-whom basis in the moneyflow accounts, and conversely one of the major barriers to converting input-output to a system of wider transactions coverage including financial flows.

The systems differ considerably in the number of sectors, with the input-output structure containing many more than either of the others. Where input-output may have hundreds of business sectors, national income has a single business sector, and moneyflows has several.

There can be no question that within certain limits the more detailed the sectoring, the more useful is a social accounting system as an analytic tool. However, the optimum degree of such detail is probably not the same for all three systems. Availability of data,

the nature of the analytic problems involved, and the amenability of pertinent functional relationships to expression in a form adaptable to machine calculation are among the factors influencing the extent of sector detail that will be found analytically useful. In all these respects, the optimum number of sectors in input-output is greater than that in moneyflows.

Moneyflows has certainly not yet achieved its optimum detail in sectoring. However, even if finer industry sectors were substituted for the present business sectors in moneyflows, they would not correspond to the input-output sectors because of differences in the nature of the transactors being grouped into sectors in the two systems. In input-output, the basic unit is the establishment; in moneyflows, it is the firm. This difference is not accidental. It is closely related to the purposes and orientations of the two systems. Analysis involving technological input relations naturally focuses on the establishment, and analysis involving financing and monetary and credit problems in any form must deal with the firm as the basic entity. In addition, much of the data necessary for the input-output system is available only on an establishment basis, and much of that necessary for moneyflows is available only on a firm basis. The same distinction exists to some extent with respect to input-output and national income. Profits is essentially a firm concept, not an establishment concept.

F. Conclusion

The differences in sectoring and transactions coverage discussed here are not the only such differences among these three systems. There are, moreover, differences arising from use of different data sources and from different estimates in areas where there are no adequate data. As a consequence of all this, the relations among the three systems are extremely complex. To go from one to another, or indeed even to go from a single sector in one to the closest corresponding sector in another, requires an elaborate and detailed process of translation or reconciliation. There is no easy way out of this. Detailed reconciliations between national income and moneyflows are given in *Flow of Funds in the United States, 1939-1953*, as cited. The Interindustry Economics Division has done much work in reconciling input-output and national income. A detailed statistical reconciliation between input-output and moneyflows, as opposed to the detailed conceptual reconciliation upon which much of the above discussion is based, has not yet been at-

tempted. The preliminary steps in that direction indicate, however, that the complexities of this reconciliation will be even greater than those of the other two. Indeed, it is unlikely that any significant reconciliation is possible in the present state of the two systems. At a minimum there is needed in moneyflows a subsectoring of the corporate and noncorporate sectors by type of industry, and in input-output a classification of investment expenditures by the industry doing the investing.

These reconciliations are not merely of technical interest or the product of idle curiosity. They are of considerable analytic importance. This importance stems from the partial nature of each of these systems. No one of them is a complete representation of the economy, each one viewing it from a special perspective. Adequate comprehensive economic analysis cannot be done in terms of one of them alone and, at a minimum, should be done in terms of all three. Failing a single all-embracing social accounting system covering all perspectives of economic transactions, there must be rigorously and accurately laid out paths of translation from each of the systems we do have to the others, if we are to have economic analysis that is comprehensive in scope and at the same time rigorous and internally consistent.

The discussion here has been in terms of the structures of three specific systems. Certain of the characteristics of each of these are not necessary characteristics of systems of that type. Different decisions could have been made in many particular instances, and different systems of the same general types or with the same general orientations could be set up. But many of the major characteristics of the structures, the major differences between them, and the major features and problems of reconciliation and translation between them are not accidental, but are intimately related to the general orientations and analytic purposes of these types of structures. Thus, regardless of the specific forms of the systems, a serious problem of reconciliation would exist whenever it was desired, for example, to shift from input-output orientation to moneyflow orientation, i.e. to analyze the financial and monetary implications of the particular input-output analysis, or to analyze the influence of monetary and credit developments on production and investment decisions.

Ideally, what might be wanted is a unified social accounting system that would view the economy from all perspectives at once. I have attempted a small step toward this unification by trying to set up an illustrative system for a single year combining the moneyflows

and national income systems and perspectives, a task incomparably easier than setting up a combined moneyflows and input-output system.[14] Yet even in this less ambitious attempt, the same factors that make a reconciliation between the systems complex work also to make a combined system cumbersome and complicated. For the more comprehensive unification, the factors of difference might very well prevent the setting up of a unified structure. Even where possible, moreover, it is not obvious that what might be gained in the more comprehensive approach compensates for the extremely complicated structure and for the sacrifice of adaptability of structure to specific orientations. In any case, whether the solution to the problem of comprehensive and unified analysis is approached through the setting up of unified structures or through the reconciliation of specialized structures, there is required a detailed knowledge of the relations between existing systems.

COMMENT

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Wassily Leontief tells us that to understand the relations and conflicts among various economic policies we need "the framework of a general all-purpose analysis." I take it he means a general all-purpose model. Stanley J. Sigel makes a slightly more qualified statement: "Failing a single all-embracing social accounting system covering all perspectives of economic transactions, there must be rigorously and accurately laid out paths of translation from each of the systems we do have to the others, if we are to have economic analysis that is comprehensive in scope and at the same time rigorous and internally consistent." Even if we take Sigel's view, it may be a long time before economists can do much rigorous logical analysis.

This is my first objection to the statements just quoted. I do not see how anyone can read Sigel's excellent discussion of the relations between the input-output system of social accounts and the moneyflows system without being convinced that a synthesis of the two would be an exceedingly difficult task. I had thought it tough enough before. Sigel convinces me that it is even tougher than I had realized. But Leontief seems to envision just such a synthesis when he says, "the forthcoming release of the moneyflows study . . . should con-

[14] See also Morris A. Copeland, "The Feasibility of a Standard and Comprehensive System of Social Accounts," a paper presented at the Conference on Income and Wealth in October 1954 and to be published in *Comparability of National Accounts*, Studies in Income and Wealth, Volume Twenty, Princeton University Press for National Bureau of Economic Research, 1956.

tribute much to the development of realistic price analysis within the framework of the input-output approach." If Leontief sees how he can construct a synthesis of the moneyflows approach and his own, I wish he would spell it out for us. I make the same request of George Jaszi. I do not think he really comes to grips with this problem in his Comment. I will return to it in a moment.

But let me note a second objection to the idea that what we need is one all-inclusive all-purpose model, or else accurate intermodel translation formulas, if we are to function competently as economists. The second objection relates to the adequacy of such a model, if we could get one. It is surely highly desirable to develop the quantitative aspects of economics—and we are concerned at this Conference with what is clearly a major development in quantitative economics —but we ought not to speak as if there were no qualitative aspects. What we can learn by measuring is but a part—probably a small part—of what we need to know about our economy. If we are to deal with our economy realistically, we must not overlook important influences like the ever-changing structure of the law just because model analysis is not capable of dealing with them.

By way of stressing the differences in orientation between the input-output studies and the other two social accounting structures under consideration here, let me call your attention to a contradiction. Carl Christ tells us that "input-output analysis is essentially a theory of production." Various other speakers have made similar statements. But Sigel holds a contrary view: "In national income . . . a sharp distinction . . . between the processing sector and the final sectors . . . is rooted deep in the theory of production. . . . In input-output, on the other hand, the distinction . . . between the two groups of sectors . . . exogenous . . . and . . . endogenous . . . is between sectors for which a stable input coefficient structure exists, and those for which it [does not]." I think Sigel is right.

Christ also tells us that input-output analysis is not a general equilibrium system. His reason is "that it does not envision optimizing behavior on the part of economic organisms faced with alternative courses of action." This appears to be a purely terminological criticism, and the terminological precedents do not seem to be altogether on Christ's side. At any rate, if optimizing by sentient beings is a necessary condition to equilibrium, it is news to me. And I am sure it would be news to a great many physicists. Moreover, Christ's own investigations into neo-Keynesian cycle models would be regarded by many economists as investigations into general equi-

librium conditions. Let me suggest a way out of this terminological difficulty. I propose that input-output analysis provides a general equilibrium model, not an optimizing general equilibrium model.

I would stress the statement that the input-output approach and the moneyflows approach have different orientations. But let me point out a resemblance that has been overlooked. Herman I. Liebling tells us that the input-output approach leads to "specific consideration of the statistical deficiencies or aberrations in each sector, whereas the national income accounts are too aggregative to indicate areas needing specific investigation." In other words, the input-output approach is more precise, and should help to make determinations of GNP more precise. This seems clearly so. But all these propositions apply also to the moneyflows approach, and apply a fortiori. In defense of the a fortiori part of this statement, I shall take time to offer only one main consideration. The input-output approach may be able to help on determinations for bench-mark years—1929, 1939, 1947, etc. The moneyflows approach should be able to help here too. It should also be able to help on the other years, and even on the quarterly estimates.

With the exceptions herein noted, and a few other quite minor ones, I concur heartily in Sigel's comparisons of the input-output, GNP, and moneyflows systems of social accounts.[1] First, let me note a fundamental difference between input-output and the other two systems that is almost too obvious to mention. The GNP and moneyflows systems are social accounting systems. The same cannot be said of input-output. Input-output is a social accounting system plus a set of simultaneous behavioristic equations that can be summarized in a matrix of input coefficients.

Second, let me take issue with a difference that Sigel alleges. He tells us that the moneyflows system rests on a double-entry basis, the other two on a single-entry basis. I would prefer to say quadruple-entry rather than double-entry. It can be agreed that the moneyflows system rests on such a basis. So, I think, do both the other systems. J. R. N. Stone and Richard Ruggles clearly regard the GNP accounts in this way,[2] and I suspect that Liebling holds a

[1] Sigel speaks of the national income system of social accounts. Since the system focuses attention on the GNP account, it seems better to refer to this as the GNP system.

[2] See J. R. N. Stone, Appendix Chap. II in *Measurement of National Income and the Construction of Social Accounts*, United Nations, 1947. See also Richard Ruggles, *An Introduction to National Income and Income Analysis*, McGraw-Hill, 1949, p. 23.

similar view of input-output.[3] It is difficult to do otherwise with any social accounting system in which a comprehensive set of sector budget equations is crossed with a comprehensive set of type-of-transaction equations.

Finally, let me note that Sigel seems to overdraw the conceptual divergence between the moneyflows and GNP systems. I have elsewhere overdrawn it myself. Probably I have been a much more grievous sinner in this respect than he. But the conviction has been growing on me that conceptually the two can be made one. In fact, the GNP system of accounts as it stands today is more than a mere GNP system. The elaboration of the several final-sector accounts is definitely and deliberately such as to reveal a good deal of the money circuit. And conceptually it is easy to construct a synthesis of the GNP and moneyflows systems of social accounts. But underscore the word "conceptually." The pattern of the GNP accounts became set before the moneyflows idea was injected into the picture. Hence, there are parts of the money circuit, especially the financial area, that the GNP system is very badly adapted to handling. Thus, statistically, there is a substantial divergence between the two systems of accounts, and the translation formulas that Sigel has been engaged in developing are pretty complicated.

Something like what has just been said of moneyflows and GNP can be said of input-output and GNP. Conceptually, the two systems can readily be synthesized, but each has come "to lead a life of its own."

When we try to relate the input-output and moneyflows systems of social accounts, the problem is vastly more difficult. Between these two there seems to be an inherent conceptual divergence. Assuming we have good translation formulas between input-output and GNP and between moneyflows and GNP, it does not necessarily follow that we can get such formulas to relate input-output and moneyflows. Input-output is specifically designed to be invariant to changes in the ownership structure of the economy. Moneyflows is designed precisely to reveal the effects of changes in ownership structure.

Reply by Stanley J. Sigel

Morris A. Copeland takes issue with my distinction between moneyflows on the one hand and income and product and input-output analysis on the other with respect to single versus double entry (or

[3] See discussion of Table 3, p. 306.

double versus quadruple entry as he prefers). I quite agree that there is nothing in the nature of the latter systems in the abstract that prevents their being recorded on a quadruple-entry basis. However, I stressed in my paper that I was not dealing with systems in the abstract nor with systems as they might have or should have been constructed, but as they are actually presented. Copeland's references to the attitudes of J. R. N. Stone and Richard Ruggles are, therefore, beside the point, since the former is discussing a hypothetical system and the latter is idealizing the income and product system. In view of what I had thought were Copeland's general philosophical and methodological preferences, I am greatly surprised to hear that he has chosen the hypothetical and the ideal over the actual as the basis for comparison. The distinction I have drawn is valid for the systems as they now stand; it would not necessarily be valid for other systems of these types. And it must be stressed that any attempt to put the existing income and product and input-output systems on a quadruple-entry basis would result in quite different structures.

I react similarly to the comment that I have overdrawn the divergence between the moneyflows and national income systems. Again, I might agree that, conceptually, systems of these types can be constructed so that they are one, or are such as to make easy a synthesis of the two. However, the present systems are not one as they now stand, and a synthesis would require structural changes in both. Stressing that conceptually they are one, when factually they are not, is likely to lead to serious analytic and statistical misuse of the existing systems.