SOME ASPECTS OF A SYSTEM OF INTEGRATED
NATIONAL ECONOMIC ACCOUNTS*

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Recent experiences in national accounting, both in theory and practice, seem to be moving in the direction of integrating various component parts of national economic accounting. In the theoretical field of national accounting not a few attempts have been made to construct a structure of economic circulation since a decade or two.[1]

In the field related to the theory of national accounting, also some singificant developments have been made. In particular, the input-output system and the flow of funds system have direct connection with the integration of national economic accounting.

The integrated system of national economic accounting is not only of great interest as a description of various fundamental economic activities between sectors, but also of grave concern from the view point of economic planning. As a characteristic feature of capitalistic economy, the guidance of the economy by government generally avoids the use of direct measures that regulate the economy, e.g. price control, rationning etc. Thus the indirect measures such as discount rates and tax rates are frequently mobilized by the government as means of economic planning. The impact of these measures on economic activities, especially those activities which are within the scope of national accounts, are roundabout in nature. In order to make out a chain of effects which are due to the impact of these instruments the general framework of economic circulation as an integrated whole is indispensable. One can not say the extent and magnitude of these impacts without knowing how various funda-

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In the subsequent article the use of the terms, *national economic accounts* and *national accounts*, is carefully distinguished. The use of the former is applied to the description of economic circulation in general by the use of accounts while the latter is confined to national income accounts and related totals. Consequently, the latter is part of the former.

[1] Some of them may be of worth mentioning here. The Eco-circ system developed by R. Frisch is perhaps the earliest attempt to present an integrated system of economic circulation (regarding with a brief explanation of Eco-circ system, see I. Ohlsson, *On National Accounting*, Stockholm 1953, pp. 51—61). Along the similar line, O. Aukrust devised a system of social accounting in his paper: "On the Theory of Social Accounting", *The Review of Economic Studies*, 1949—50. Lindahl's system of national accounts first presented by E. Lindahl in his book, *Studies in the Theory of Money and Capital*, London 1939, and developed later to a full-fledged theory of national accounting in his paper: "The Basic Concepts of National Accounting," *International Economic Papers*, No. 7, 1957, seems to follow the same line of thoughts. A recent development of the REFI interflow system of the University Institute of Economics, Oslo University, under the guidance of R. Frisch genuinely directs its forcus to the integrated system of economic circulation.

mental activities are interrelated between sectors.

The need of integration of national economic accounting has something in common with present status in Japan. Economic planning experience in Japan, particularly in long-range economic planning, strongly suggest that the implementation of economic planning heavily relies on monetary and fiscal measures, hence it follows that further elaboration of economic planning may not be successful, unless it is grounded on the knowledge of a comprehensive system of national economic accounting.[2]

Aside from the necessity of integration of national economic accounting that is due to the planning purpose, there is an urgent need of great importance in Japan for integration. The measuremeṅt of official national income statistics in Japan has been developed under the strong influenc of the United States since the end of the last War. However some drawbacks still exist in the present Japanese national income statistics. One of the most important among them is that the present national income statistics does not constitute a fully articu-lated system.[3]

As far as the construction of an input-output table is concerned, Japan has had fairly exten-sive experiences, and some work has been made in the construction of a flow of funds system.[4]

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[2] An exposition of the New Long-Range Economic Plan (1961—70) was made by K. Ohkawa in his article, "The Use of National Income Accounts for Long-Range Planning in Japan (a mimeographed paper which was presented at the 1961 conference of the International Association for Research in Income and Wealth). He too pointed out the need for integration.

[3] The main portion of our official national income statistics consists of nine tables. Table 1 is named "Kokumin Soseisan to Soshishitsu" (Gross National Product and Expenditure), which is the national product and expenditure account in the usual sense. Table 2 is named "Kojinshotoku to sono Shobun" (Personal Income and its Appropriation), which is the appropriation account of personal sector. Table 3 is named "Zaiseishushi" (Receipt and Expenditure of the Government), which is the appropri-ation account of the general government. Table 4 is named "Kaigaishushi" (Receipt and Expenditure of the Rest of the World), which is the rest of the world account. Table 5 is named "Sochochiku to Soshihonkeisei" (Gross Saving and Gross Capital Formation), which is the consolidated capital formation account. Table 6 is named "Sangyobetsu Kokumin Shotoku" (National Income by Industrial Origin). Table 7 is named "Bunpai Kokumin Shotoku" (National Income as Distributive Shares). Table 8 is named "Kokumin Soshishitsu" (Gross National Expenditure), which shows the breakdown of components of gross national expenditure. Table 9 is named "Jishitsu Kokumin Soshishitsu" (Gross National Ex-penditure in Real Terms). As far as Table 1 to Table 5 are concerned, these five accounts are almost same to the five summary accounts of United States's national accounts. But the item of national income at factor cost appears in Table 1 instead of being separating out by distributive shares as in the summary accounts of the United States. While personal income which appears in Table 2 includes net transfer payments from the government, personal income which appears in Table 7 excludes transfer payments from the government. The fact prevents the present national income statistics from being a fully articulated system.

[4] The first input-output tables for 1951 were made separately by the Ministry of International Trade and Industry and the Economic Planning Agency of the Japanese Government. The Economic Planning Agency made a input-output table for 1953 for planning purpose. The MITI input-output table was revised to apply for 1954. The input-output table for 1955 is the first joint and cooperative work between ministries. The input-output table for 1960 is under joint construction by the several ministries. Japan has developed two different system of flow of funds. The first is the Bank of Japan's and the other is that of the Economic Planning Agency. A brief survey of these two flow of funds system was given by G.S. Dorrance in "The Present Status of Financial Accounts: A Review of Recent Develop-ments", *Income and Wealth*, Series 9, London 1961. See also his "Financial Accounts in Countries other than the United States and Canada", *The Flow-of-Funds Approach to Social Accounting*, Princeton, 1962.

However the systems of input-output table and flow of funds are neither properly coordinated to the national income accounts so that the figures of the input-output table are comparable with national income statistics, nor the system of accounts, especially like the flow of funds system of the Bank of Japan, can be fitted into the accounting structure of the present national income statistics.   The drawbacks in national income statistics, the lack of coordination between the national income statistics, the input-output table and the flow of funds system can be overcome if a system of integrated national economic accounts is worked out.

Two Approaches to the Integration of National Economic Accounts

As the methodology of the integration of national economic accounting two principal approaches come at once to our mind.   As the well-established terminology to the approaches is not still available, we may call the one *the total integration of national economic accounts*, and the other *the partial integration of national economic accounts*.   By the former, we refer to attempt to construct a comprehensive system of accounts capable of recording various aspects of economic activities at a single stroke.   As the scope of the total integration of national economic account is comprehensive, the transactions that reflect various economic activities necessarily cover both *real transactions* and *financial transactions*.   The real transactions are those transactions which are related to the production, appropriation and resting of real objects, i.e. goods and services, of a transactor.   The financial transactions are those transactions which are related to the accrual, disappearance and change of financial objects as either claims for or debts of a transactor.   The financial objects are defined as those objects which accompany an increase of lending to one transactor, and at the same time borrowing of the other.   The interrelationships of economic activities between *sectors* are another forcus of comprehensiveness.   Consequently in mapping out the design of integrated national economic accounts a detailed specification of transactions with various economic activities and transactors is of fundamental importance.[5]

In contrast, the forcus of the partial integration of national economic accounts is limited to selected economic activities.   In the partial integration approach, a central core of the integrated national economic accounts is picked up.   The scope of the central core then is enlarged with respect to a particular economic activity so that various components of national economic accounts may be coordinated with each other.   A few examples of the partial integration may be useful for clarifying the nature of the approach.

Suppose that the national accounts are chosen as the central core in the partial integration approach, and that the partial integration is related to production activity.   The break down of the national product and expenditure account by production sector brings out sectoral production accounts.   The sectoral production accounts serve as a bridge be-

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[5] Examples of the total integration of national economic accounts are few.   Among them the REFI interflow system of the University Institute of Economics of Oslo University should be noted.   The skeleton of the system was first presented in Frisch's paper, "Oslo Decision Models", Memorandum fra Sosialøkonomisk Institutt, Universitetet i Oslo, 4 June 1957, the system is further elaborated in his "A Generalized Form of the REFI Interflow Table", Memorandum fra Sosialøkonomisk Institutt, Universitetet i Oslo, 17 November 1959.

tween the input-output system and the national accounts. Similarly, the consolidated capital formation account in the national accounts are disaggregated into institutional sectors, so that the sectoral capital transaction accounts are obtained. The role of sectoral capital transaction accounts as a bridge connecting the national accounts and the flow of funds system is easily extended to the integration of national balance sheets with national accounts. Once time series of sector accounts of national balance sheets are given, the change of sector accounts of national balance sheet are matched with the sectoral capital transaction accounts. Thus the nature of the partial integration of national economic accounts is characterized by the specification of fundamental economic activities.

There are three reasons why the partial integration approach is recommended for Japan. First, the theory of national economic accounting in Japan and elswhere has not yet attained levels which make feasible a full-fledged system of integrated national economic accounts though the importance of the integration problem is fully recognized. Second, in practice the statistical materials are inadequate for compiling integrated system of national economic accounts, even though the integrated system of national accounts has been completed in theory. Third, the total integration and the partial integration are not alternative approaches in the integration of national economic accounts. For the ultimate objective of the integration of national economic accounts the total integration is superior to the partial integration because of comprehensiveness. However the interrelationships of economic activities, both in real and in financial transactions, are satisfactorily made clear even by the partial integration approach, as examples quoated above show. Limitations in the comprehensiveness of the partial integration approach is well compensated by ease of statistical measurement. Among these the second and third reasons are of particular interest in Japan. Our experience with the commodity-flow method in the measurement of national income in Japan is limited, due mainly to insufficient data, especially the census data on wholesale and retail trade. Also as pointed out above the present status of national income statistics in Japan is easily adaptable to the partial integration approach rather than the total integration approach.[6]

The logic of the partial integration of national economic accounts is diagrammatically shown in Figure 1.

Comparison of our Figure 1 with a chart of a similar kind may make clear the characteristics of our appraoch to partial integration. Let us compare it with Chart 1 of *The National Economic Accounts of the United States*.[7]

As far as the methodology is concerned, there is not so much of a difference between our approach and that of the book. However one point deserves to be noticed. Though attempts to reconcile the scopes of the five components of national accounts each other were made in the book, it does not appear that these components are integrated in a rigorous

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[6] The conclusion was also drawn by the Research Committee of National Economic Accounting established by the Economic Planning Agency of Japanese Government. In the Final Report of the Research Committee of National Economic Accounting the Committee discusses the integration problem fairly in detail and recommends the so-called partial integration approach. See, Kokumin Keizai Keisan Chosa Iinkai Hokoku, (*Report of the Research Committee of National Economic Accounting (March 16, 1962)*, p. 18).

[7] *The National Economic Accounts of the United States*, National Bureau of Economic Research, General Series 64, 1958, p. 49.

FIGURE 1
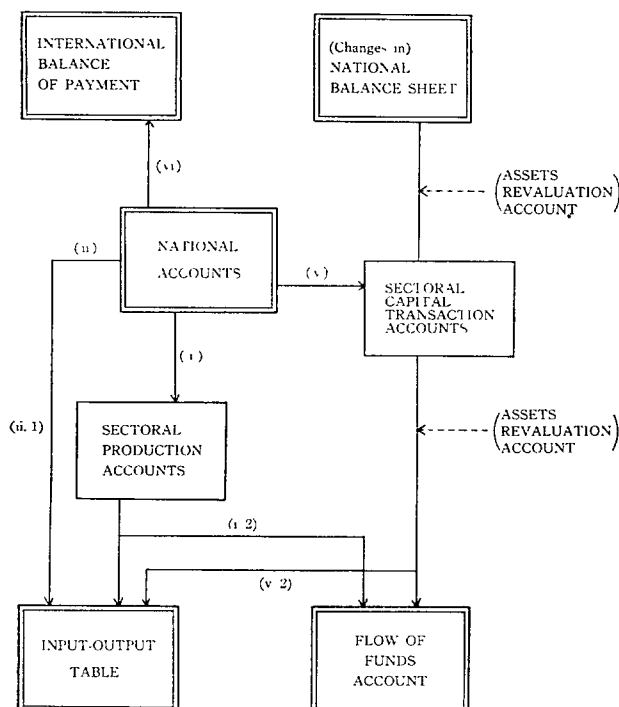
A NOTE TO THE (FIGURE 1): Numbers in parenthese near arrows between double squares, which stand for five main components of national economic accounts, and those in parenthese between a double square and a single square (sectoral account) indicate the number of accounts which will be discussed in the next section.

form in the sense that an accounting form which connects one component with the others is designed for. In the Figure 1 national accounts are integrated either with the input-output table through the sectoral production accounts or with the flow of funds accounts (and the national balance sheet) through the sectoral capital transaction accounts. For our approach an integration in the loose sense as in the book only appears in the integration of national accounts with the international balance of payment. Again, it is noticed that the starting point of the integration in our approach is the national accounts. The fact indicates without ambiguity the crucial part of national accounts that play in the integration of national economic accounting. The part is nothing but the one as a central core of the integrated system of national economic accounts.

National Accounts as a Central Core of the Integrated
National Economic Accounts

In the partial integration approach it is essential to select a central core for the integrated national economic accounts. Though some 'arbitrariness may be accompanied with the selection process, it is quite sensible to pick out the national accounts as the central

core. This is because the national accounts have a long history as the statistical framework of fundamental economic activities between sectors.

National accounts in most countries are composed of a system of accounts and supporting tables. As the system of accounts is a simplified description of fundamental economic activities between sectors, it is preferable that the design of accounts is simple enough in sectoral division and accounts construction. In principle, sectors are divided according to the function of transactors who belong to the sector. However this functional criterion for sectoral division is not necessarily applied unconditionally in practice. Smuggling in of the so-called institutional criterion in the sectoral division is inevitable. The situation arises in Japan too. According to the convention of Japanese national income statistics, sectors are divided into three sectors, i.e. business enterprises, personal sector and government sector. The second includes not only the private households and the non-profit institutions but the proprietors households such as farmers and other small proprietors.[8]

The government sector in Japanese national income statistics is a good example of the mixture of the two criteria of sectoral division. The government sector, here, encompasses not only the general government in the national accounting sense, but also the business enterprises which are owned or controled by the government. It is better to include the latter in the business enterprise sector from the functional criterion.[9]

TABLE 1

	Japanese National Income Statistics	UN Manual	OEEC A.S.N.A.
Government General Account			General
Government Special Account (non-enterprise)	Government	Government	Government
Government Enterprises			Enterprises
Ancillary Agencies			
Independent Public Enterprises or Public Corporations		Independent Public Bodies	

OEEC A.S.N.A.: OEEC, *A Standardized System of National Accounts,* 1958 edition.

However, the selection of the criterion for sector division in national accounts has been neither unambiguous nor of uniquely determined character. As examples in Japan show, the functional criterion is apt to be mixed with the institutional criterion in actual sectoring. Furthermore, the meaning of "functional" or "institutional" does not seem to be clear-cut.

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[8] As a minor point, non-profit institutions which are established for the purpose of enhancing the productive efficiency of business are also included in the private sector. This is also a deviation from the functional criterion too.

[9] It may be of some interest to compare various difinitions of the government sector in the table above (Table 1). As a basis of comparison, we select definitions of the government sector in Japanese national income statistics, United Nation's *A Manual for Economic and Functionl Classification of Government Transactions, New York, 1958* and OEEC's *A Standardized System of National Accounts, 1958 edition, Paris, 1959* respectively.

As Jaszi once pointed out, the statement that sectors are divided on an institutional basis and that accounts are drawn up on a functional basis could be read in the opposite way: that sectors are separated on a functional basis and that accounts are drawn up on an institutional basis.[10] So a closer investigation of the meaning of "functional" or "institutional" is useful for a clarification of the purpose of the sector division in national accounts.

In the first place it turns out that the distinction between the institutional and the functional criteria mainly refers to the grouping of *transactors*. How are transactors specified? According to the functional criterion, the transactors are grouped by the principle that each member of a homogeneous group (or set) of transactors functions as a decision unit in a homogeneous group of transactors. Accordingly, the households are regarded as the decision unit which makes a consumption decision in the sense that theory of consumer's choice is straightforwardly applied as the guiding principle of the behaviour of the decision unit. Non-profit institutions are also treated in the same way as the households on the ground that the former is regarded in its capacity as the decision unit of consumer's planning. According to the same criterion, the business enterprises are the decision units that make decisions on production plans. Corresponding to the theory of consumer's choice, the guiding principle of the behaviour of business enterprises is the theory of productuion planning. The functional criterion that divides households and non-profit institutions from business enterprises is somewhat obscured by the existence of proprietors households or unincorporated enterprises. In their capacity as decision units these unincorporated businesses are mixed units. Their decision that is made as households is not necessarily separated from that as business enterprises. Another ambiguity is caused by the scarcity of data which are needed to clarify the intrinsic characteristics of the behaviour of these unincorporated enterprises. The government sector is also not immune from the same difficulty. Government authorities have a dual function. On the one hand they behave in the same way as households and non-profit institutions. They allocates their revenues to items of consumption expenditures. But the genuine function of government authorities lies in the production of public goods and services.[11] How is the production of public goods and services fitted into

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[10] George Jaszi, "The Conceptual Basis of the Accounts: A Reexamination", *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth, Vol. 22, Princeton 1958, p. 27.

[11] The genuine role of government lies in the supply of public goods and services which are not produced by private businesses or households. Essentially the public goods and services are for collective use of the public. Highways, for instance, are used for both consumption purpose and production purpose. Thus the public goods and services are frequently defined as those goods and services whose marginal utility of one economic unit is equal to that of others. Police and military services are other examples of public services. In reality, the government agencies not only supply the public goods and services, but also take a part in the production of non-public goods and services. Accordingly the distinction between the activity of the government which refers to the supply of public goods and services and that which does not refer to the supply of public goods and services is meaningful from the standpoint of classification of transactors. The former activity may be termed the pure government activity, and the latter is government business activity. Government agencies which carry on the pure government activity belong to the general government sector. Government agencies which are engaged in the government business activity are included in the government enterprise sector. In this way the functional criterion of sector division is consistently maintained. As I previously mentioned, the sectoring of "government" in the current Japanese national income statistics is not based on the functional criterion. In Japan the definition of the government sector is too broad to indicate economic activities of the government. In the recent *Report of the Research Committee of National Economic Accounting* it is recommed that the present government sector should be rearranged so that it could be divided into two sub-sectors, the general government and others.

the national accounts? As a growing tendency of the mixed economy, government enterprises compete with private business enterprises in the production of non-public goods and services. How should the dividing line between government enterprises and private business enterprises be drawn? These are problems that should be faced when we proceed to the sectoring of national accounts. The second criterion for sectoring stems from the previous discussion. As pointed out above, both criteria refer to the grouping of *transactors*. In both criteria the characteristics of transactors are assumed tacility to be independent of the distinction between real and financial objects transacted. However, the sectoring of transactors may be related to the ownership of real and financial objects because a dividing line between the households sector and the business enterprise sector is drawn on the ground that the former is a group of transactors which own primary factors and financial objects, while that the group in the latter is the one which owns real objects other than primary factors.[12]

Moreover the point is relevant to the treatment of government activity, for government agencies can be classified as an ownership sector of either real or financial objects. Should government agencies be classified as a household sector or as a business enterprise sector? In the former case, government agencies are regarded as a set of transactors owning primary factors and financial objects. It appears that the argument that the government sector supplies (primary) factor services is deeply rooted in the assumption that the government sector is an ownership sector of primary factors and financial objects.[13]

In the latter case, the conclusion is that those government agencies which own real objects other than primary factors form a sector.

It is true that the sectoring based on the ownership of real or financial objects is not prevalent in national accounting, but the idea seems to be of some interest from the standpoint of the integration of national economic accounting since a sectoral breakdown of financial transactions by each financial object throws lights on the financial structure of the economy. It is essential for the clarification of financial aspects of the economy that the financial structure is shown as the liquidity structure. Thus a classification of finanical object according to the degree of liquidity is useful for the purpose. The integrated national economic accounts thus obtained throws light on the complex of real and finacial transactions.[14]

Summing up, we come to the conclusion that the sector division based on the functional criterion is preferred, and that the sector division according to ownership of financial objects is of some use for the monetary analysis. For the sector division of Japanese national income staistics, it is recommended that farmers and proprietors be segregated from house-

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[12] The sectoring on the basis of the ownership of real and financial objects was first introduced by E. Lindahl, *Studies in the Theory of Money and Capital*, p. 74. It seems to me that the point has long been neglected except in a few cases.

[13] R. Frisch persistetly argued that the government activities are regarded as the supply of factor services, because they furnish the economy so-called "organization" (the school system, defence, care of the sick etc.). Consequently Frisch insists that indirect taxes minus subsidies are remuneration for factor services of government. However it seems to me that Frisch is not fully aware of the fact that his argument is intimately related to the above mentioned logic of sectoring. See Ohlsson, *op. cit.*, p. 117, on Frisch's argument.

[14] An interesting attempt to introduce the ownership sectors into an integrated system of national economic accounts has been made by R. Frisch. In particular, see his article: "A Generalized Form of the REFI Interflow Table", *op. cit.*

holds and non-profit institutions in the personal sector, and that government enterprises, however they may be defined, be separated from the general government.[15]

Construction of *accounts* is as important as sectoring. Various fundamental economic activities are specified by accounts. How many accounts corresponding to the fundamental activities should be introduced in the system of national accounts? It is evident that greater the number of aspects of economic activities we choose to include the more elaborate the description of the economy becomes, but the national accounts as a central core of the integration of national economic accounts should be a simplified representation of trans-actions. As a usual convention in the accounting design of national accounts, there is no doubt that (1) production, (2) appropriation, and (3) capital formation of real objects form the fundamental economic activities, so that corresponding to these economic activities the production account, the appropriation account and the capital formation account are con-structed in consolidated form respectively.

From the standpoint of the analysis of economic behaviour a sectoral division of the consolidated appropriation account into the appropriation account of the personal sector and that of general government is highly fruitful. There are two ways of fitting international transactions into a system of accounts. First, international transactions are regarded as transactions which are made between the nation and foreign transactors. It follows from the approach that the rest of the world account is a consolidated statement of transactions which refer to the rest of the world sector. Second, international transactions are considered an elaboration of economic activities. Following this approach the rest of the world account is formed in such a way that those transactions which are not related to domestic economic activities are recorded in the account. The classification of transactions, in the former case, between the international transactions is made according to the principle of whether each transaction refers to foreigners or not. In other words the classification is based on the difference of transactors. On the other hand, international transactions in the latter case are recorded in the rest of the world account as representing a particular aspect of economic activities. Though both these approaches does not seem to be without grounds, the reason why the former is preferred are twofold. It is doubtful whether the economic activity referring to the rest of the world is the one that is comparable to any other fundamental economice activities. Second, under a fully articulated· system of national accounts, the rest of the world account is derived from a consolidation of accounts which are related to national transactors. The fact implies that it is a mere reflection of national economic activities.[16]

Sometimes it turns out to be convenient to keep a recording of distribution activities which is separated from the production activities. The way of recording is of particularly usefulness when we are interested in the conditions under which national products are

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[15] As for defining government enterprises in practice, difficulties may arise because the dividing line between private business enterprises and those which are owned or controled by the government is somewhat ambiguous. We cannot go into the details of the definition of government enterprises in Japanese national income statistics. However it may be pointed out that the problem is practically important, as the weight of government enterprises in business activity tends to increase.

[16] G. Jaszi seems to support the latter view in his article before mentioned, saying that "I prefer the external-account approach, in this simpler variant, rather than the international sector approach" (Jaszi, *op. cit.*, p. 35). However his reasoning for the adoption of the latter approach is not convincing.

distributed to the factors of production. The independent recording of distribution activity implies that a particular account which indicates distribution of net (or gross) outputs to various factors of production as remunerations is useful for national accounts. We may call the account in the consolidated level the consolidated income formation account.[17]

To sum up, the fundamental constituent factors of national accounts are *sectors* and *accounts*. It is useful that transactors are grouped innto sectors according to the functional criterion in the sense that each sector is composed of a common and homogeneous decision making transactors. As a logical consequence of the functional criterion, international transactions are grouped and expressed as a sector account. The specification of accounts is made by various economic activities. It proves to be useful that the production of final outputs, their distribution to factors of production (income formation), and the appropriation of income and capital formation are selected as basic economic activities, each of which correspond to relevant accounts.

To draw up a system of national accounts the following notations are used:

Y, National Income (Net National Product at Factor Cost)

T^{id}, Indirect Taxes less Subsidies

D, Depreciation Allowances

W, Compensation for Employees

E, Income of Proprietors and Farms

R_h, Personal Property Income less Interest on Consumers' Debt

R_g, Government Income from Property and Entrepreneurship less Interest on Public Debts

T_h^d, Personal Direct Taxes

T_c^d, Direct Taxes on Corporations

S_c, Saving of Corporations

C_h, Consumers' Expenditure on Goods and Services

T_{hr}^f, Net Transfer of Person to the Rest of the World

S_h, Personal Saving

C_g, Government Current Expenditure on Goods and Services

T_{gh}^f, Net Transfers of Government to Person

T_{gr}^f, Net Transfer of Government to the Rest of the World

S_g, Saving of Government

I^*, Gross Domestic Capital Formation

L^n, Net Increase of Lending to the Rest of the World

X, Sales of Goods and Services to the Rest of the World and Factor Income from the Rest of the World

M, Purchases of Goods and Services from the Rest of the World and Factor Income Payment to the Rest of the World.

A system of national accounts that plays a part of central core in the integration of a national economic accounting is presented below.[18]

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[17] The reason for the expression, income formation account instead of income distribution account, is due to the fact that some elements of transfer transactions are mixed in the account, obscuring the true nature of distribution. A more rigorous definition of transfer transactions shall be discussed later.

[18] The system of national accounts is the same as the one appearing in the *Report of Kokumin Keizai Keisan Chosa Iinkai.* See pp. 21—21 of the *Report.*

(i) National Product and Expenditure Account
$$Y + T^{id} + D = C_h + C_g + I^* + X - M$$

(ii) Consolidated Income Formation Account
$$W + E + R_h + R_g + T_c^d + S_c = Y$$

(iii) Appropriation Account for Person
$$C_h + T_h^d + T_{hr}^f + S_h = W + E + R_h + T_{gh}^f$$

(iv) Appropriation Account for General Government
$$C_g + T_{gh}^f + T_{gr}^f + S_g = T^{id} + T_h^d + T_c^d + R_g$$

(v) Consolidated Capital Formation Account
$$I^* + L^n = D + S_c + S_h + S_g$$

(vi) Rest of the World Account
$$X = M + T_{hr}^f + T_{gr}^f + L^n$$

It is easily shown that given the consistency in the detailed definitions of the items the system of national accounts is a fully articulated system. Therefore, the rest of the world account is derived consolidating the accounts from (1) to (5). It turns out to be useful that supporting tables are attached to the system of national accounts in order to supply detailed informations that are necessary for the integration purpose. In connection with (1) National Product and Expenditure Account two tables are mentioned. These are: (i.i) the sectoral production accounts and (i.ii) the cross classification of GDP (or GNP) by industry and institutional sector, with the former playing a crucial part in the integration of national accounts with the input-output table. Debit entries of the (ii) Consolidated Income Formation Account are broken down by industry. This provides a table that shows distributive shares of factors, the table (ii.i). In connection with (5) Consolidated Capital Formation Account, it is useful that (5) is supplemented by two accounts. These are: (v.i) sectoral capital trans-action accounts and (v.ii) cross classification of gross domestic capital formation by capital assets and industry. As in the case of the sectoral production account, the former is the one that connects national accounts with either national balance sheets or the flow of funds accounts in an integrated whole. The latter opens the possibility of integrating of either national balance sheets or flow of funds accounts with the input-output table via the capital formation activity.[19]

Consequently, the following tables are attached to the system of national accounts as supporting tables for integration. These are:

(i.i)   sectoral production accounts,
(i.ii) cross-classification of GDP (or GNP) by industry and institutional sector,
(ii.i) distributive shares of factors by industry,
(v.i)   sectoral capital transaction accounts,

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[19] Though our interest in the above has been the problem of integration of national economic accounts, another aspect of supporting tables may be worth the readers' attention. The (iv) Appropria-tion Account of General Government may be supplemented by a table cross-classified by functional and economic transactions. As a similar table for capital transactions of government sector is produced by (v.i), the two tables will give a comprehensive picture of government economic activity. The elaboration of the government account along this line is developed in UN's *A Manual for Economic and Functional Classification of Government Transactions*, New York, 1958.

A breakdown of consumers' expenditure on goods and services by their durability is also useful from the standpoint of analyzing consumer's behaviour, so that a more detailed break down of consumers' expenditure by expenditure items deserves to be attempted for the supporting tables in national accounts.

(v.ii) cross classification of gross capital formation by capital assets and industry.

Reutrning to (2) Consolidated Income Formation Account, one point should be noted. We have dealt with the account as a statement of the distribution of national products to factors of production as remunerations. In the accounting design the problem of measurement of items that appear in national accounts together with their classification must been taken into account. If debit entries of (2) are measured by the so-called income method, while credit entries of it are measured by the production method (or so-called commodity flow method), the total of the debtor side of (2) is not necessarily equal in value to the creditor side (national income), so that statistical discrepancy necessarily appears. I prefer that the item of statistical discrepancy is debited in (2). The procedure is contrary to the convention that the statistical discrepancy is recorded in Japanese national income statistics, because it is recorded as a debit entry in the account of Gross National Product and Gross National Expenditure. The reason why I dispense with the statistical discrepancy in (1) National Product and Expenditute Account is due to the fact that (1) plays an essential part for the integration. (1) is a consolidated statement of production activity in the economy. With the consolidation of sectoral production accounts, the input-output table is easily integrated with national accounts. Therfore, sectoral production accounts must record what each sector produces and how products (net or gross) are sold to relevant sectors. The production method seems to be the only correct method in compiling sectoral production accounts. The production method must be preserved just for the purpose of compiling sectoral production accounts. The income method, in turn, is of particular use for the measurement of distributive shares of factor incomes. It is a consistent method of measuring figures that appear in debitor side of (2). It follows from this consideration that the item of statistical discrepancy is debited in (2) instead of (1).

In concluding this section, it may be pointed out that the distinction of transfer transactions from other real or financial transactions is useful. To give a rigorous definition of transfer transactions it seems to be of some interest to notice that in usual case real transactions which shift real objects from one transactor to another is accompanied by corresponding financial transactions which shift financial objects in the reverse way. This implies the following: suppose a set of real transactions on the one hand, say Z_r, and a set of financial transactions on the other, say Z_f. And suppose that there exists sub-sets of financial transactions which have one to one correspondence with shifts of real and financial objects respectively. If the subsets are expressed by Z_r* and Z_f*, and if the difference between Z_f and the sum of Z_f* and Z_r* is not an empty set, then a transaction which belong to the difference between Z_f and the sum of Z_f* and Z_r* is called *transfer transaction*.[20]

The concept of transfer transactions has once been discussed by E.R. Rolph fairly in detail. But is does not seem that the full definition of the concept was given by him. It is believed that there exists still room for improving the definition. Two criteria that characterize the transfer transactions are quoated in his paper. These are: (1) the transfer transactions form a part of income of receiving transactor, and is recorded, therefore, on the credit side of the income account of receiving transactor, (2) no real objects are returned for

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[20] The argument is somewhat related to the axiomatic approach in the classification of transactions for construction of national accounts. A consistent attempt to construct a system of national accounts based on the axiomatic approach was developed by O. Aukrust. See his doctoral thesis, *Nasjonalregnskap, Teoretiske Prinsipper*, Oslo 1955, pp. 79—102.

the transfer transactions.[21]

His definition loses generality on two points. First, he maintains that every transfer transactions are recorded in the income account of receiving transactor. His argument is only valid for the case of income transfer, but is not so for capital transfer.[22]

Second, it is true that income flows become transfer transactions in Rolph's sense if flows of goods and services are not exchanged in return for them, but it does not follow that every income flows which do not accompany corresponding flows of goods and services necessarily become transfer transaction. Defects in Rolph's definition of transfer transaction are removed by our definition.

Without losing generality, our transfer concept is reclassified so that many-sided proper-ties of transfer concepts could be indicated. An example of the reclassification is as follows.

	direct	indirect
Voluntary transfer	donations	subsidies
Contractual transfer	interest payment, pensions	
Compulsory transfer	direct taxes, fees	indirect taxes

As the classification of transfer transactions shows, they are more or less relevant to government transactions. In other words the classification and definition of transfer concept are usually related to government activity. As a result, a reclassification of transfer concept is meaningful on the ground that it is a useful clue to an analysis of government behaviour. According to an example previously mentioned, the transfer concept is classified in two ways. First, it is classified on the basis of whether a transfer payment is made by the agreement of two relevant transactors, or whether it is decided by the unilateral decision of one transactor. The transfer concept in the latter case is further divided into voluntary and compulsory transfer. Second, the transfer concept is divided into direct transfer and indirect transfer; the former's effects are limited to the transactors concerned while the latter's effects are extended to transactors other than those directly participating. The analysis of govern-ment activity is further elaborated by this classification of the transfer concept, which consti-tutes a genuine characteristic of government transactions.[23]

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[21] E.R. Rolph, "The Concepts of Transfers in Income Estimates", *Quarterly Journal of Economics*, Vol. LXII, May 1948, p. 329.

[22] A clear distinctisn of income transfer from capital transfer is stressed in the OEEC's *A Standard-ized System of National Accounts*, 1958 edition, Paris 1959. Especially, see pp. 88—89. In principle I find no ground to disagree with the distinction between capital and income transfers, though I recognize the fact that the debate which was raised around the treatment of international transfers between specialists of national accounts in UN, OEEC and IMF did not reach a definite conclusion.

[23] Kuznets' argument in his earlier work that indirect taxes are remunerations for government productive activities appears to be based on inadequate understanding of the exact meaning of transfer. See his "Government Product and National Income," *Income and Wealth* Series I, London 1951.

A classification of transfers somewhat similar to ours was given by I. Ohlsson. See his *On National Accounting*, p. 154.

Integration of National Accounts with the Input-Output Table

We have discussed in the previous sections a methodology for the integration of national economic accounting. As a conclusion arrived there, it was pointed out that the partial integration approach is adopted. Among fundamental economic activities described in national accounts the two has been selected, on which the forcus of integration is concentrated. These are: (1) production and (2) capital formation. In this section we shall discuss the integration of national accounts with the input-output table through construction of sectoral production accounts.

It has shown in Figure 1 that the input-output table is integrated with national accounts via sectoral production accounts. Consequently, to show the accounting design of sectoral production accounts is the proper course of our argument. From this standpoint, it is possible to construct the production account by sector that is shown below.

Most credit entries of the sectoral production account (sector i) are recorded at purchaser's price. This is a device for deriving the net domestic product valued at producer's price from the sectoral account.

Sectoral Production Account

Sector i

Purchases of Intermediate Products (purchaser's price)	U_i	Delivery of Products to producers (purchaser's price)	V_i
Increase (−) or Decrease (+) of Stocks of Raw Materials	$-R_i$	Delivery of Products to consumers (purchaser's price)	C_i
Depreciation Allowances	D_i	Dilivery of Products to government (purchaser's price)	G_i
Purchases from abroad (c.i.f. price)	M_i	Dilivery of Products to abroad (f.o.b. price)	X_i
Margins, Transportation Costs and Import Duties	T_i	Increase of Fixed Capital Goods (purchaser's price)	F_i
Net Domestic Product	Y_i	Increase of Stocks Work in progress and products	J_i
Total Input		Total Output	

Note that in conventional input-output table transactions are recorded at producer's price. This method implies that the valuation of the components of final demand vector in the input-output table corresponing to credit entries in the sectoral production account is made at producer's prices. The method of valuation in the input-output table becomes inconsistent with that of the sectoral production account. However, if the input-output table is constructed at purchaser's price basis, the valuation of it is reconciled with that in the sectoral production account. Though input-output tables which are recorded on purchaser's price

basis have never been compiled in Japan, the input-output table for 1960 that is now being compiled is 'designed so that the input-output table valued at purchaser's price may be available. Therefore the accounting design of the sectoral production account does not seem to depart too far from the reality in Japan.[24]

Sectoral production accounts supply an information on production activity by production sector. Net domestic products at market prices by sector are obtained from the sectoral production accounts as indices of production activity. What is the suitable concept for indicating production activity by sector? For integration purposes there is little doubt that sectoral products should be valued at market prices. The valuation of sectoral products at market prices is significant not only for integration but also for the analysis of production activity by sector. Those who prefer the factor cost concept of sectoral products argue that the market prices concept is vulnerable to changes in taxes and subsidies and that the factor cost concept is invariant to such changes. However, because business enterprises reorganize their production decisions when a new tex system is introduced, factor incomes of each enterprise are necessarily subject to change owing to factor substitution.

The weak point of the market prices concept lies in the existence of government activity. From a welfare view point it is supposed that a bundle of commodities on the credit side of the sectoral production account is an index of social welfare of the economy. Prices of goods and services stand for marginal utilities of relevant goods and services. Does the same situation apply to public goods and services? If the situation is the same for both to private and public goods and services, who evaluate the marginal utilities of the latter and how are they evaluated? It is not unusual that the government does not necessarily fix prices of its products on a level sufficient to cover costs of production. It is possible that marginal utilities of public goods and services (for example, medical care) are evaluated at unduly low level, if prices of government products are quoated by those which consumers actually pay for them. It is sometimes argued that government products are of worth to the economy in general, at least at what they cost, so that the marginal valuation of their products is held to be valid as a matter of principle. Or it is argued that the marginal valuation of government products is based on a principle that is entirely different from the one which is formed by market mechanism.[25]

Hicks' argument is merely a matter of convention by which transactions of public goods and services are recorded, and does not seem to be a real solution of the problem. It is an attractive idea that the marginal valuation of public goods and services are different from that of private goods and sevices, as Ohlsson argues. Admitting the Ohlsson's approach, it must be pointed out that there still exists a difficult question whether the optimal combination of both private and public goods and services is attained under the condition that the marginal valuation of private and public goods and services are separated from each

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[24] An example of official publication of sectoral production accounts is seen in the Norweigian national accounts. See, Statistisk Sentralbyrå Norge, *Nasjonalregnskap, 1930—1939 og 1946—1951.* Oslo. 1952. Though slight modifications were made in the 1954 edition of the Norwegian national accounts, the fundamental idea of sectoral production accounts is kept unaltered. Accordingly, national accounts and the input-outout table in Norway are firmly integrated via sectoral production accounts.

[25] The former the above arguments was first pointed out by J.R. Hicks in his article: "The Valuation of the Social Income", *Economica*, 1940 May; Ohlsson treats the latter problem in detail. See, his *On National Accounting,* p. 90.

other by decision units.[26]

It should be remembered that sector division of sectoral production accounts, as a matter of principle, must coincide with those in the input-output table. As a consequence, it follows that the principle of sector division in sectoral production accounts is based on activity in the broad sense of the word. However, the sectoral production accounts in reality will be presented more or less in aggregated level, and in sector division they will not differ much from the present form of publication of national income by industrial origin. The fundamental difference between the present form of national income by industrial origin and the sectoral net domestic products which are derived from the sectoral production accounts lies in the fact that the latter is a more appropriate concept to the analysis of production activity from both theoretical and measurement viewpoints.[27]

The construction of sectoral production accounts suggests that the production method is preferred for measurement of items in sectoral production accounts since it is compatible with the logic of the accounts. Though the measurement of national income in Japan has been heavily dependent on the income method, the development of the production method is very promising due to present status of industrial statistics. As our input-output table is expected to be compiled in every fifth year, the measurement of sectoral production accounts in the other years could be made by a short-cut method.[28]

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[26] The theory of public expenditure does not seem to throw much light on the problem in spite of its recent development. See, in particular: P.A. Samuelson, "The Pure Theory of Public Expenditure", *The Review of Economics and Statistics*, Vol. VIL No. 4, November 1954, and R. H. Strotz, "Two Propositions Related to Public Goods", *The Review of Economics and Statistics*, Vol. XL No. 4, November 1958.

[27] An interesting fact is that national income by industrial origin in Japan has been measured by breaking down the aggregate national income (at factor cost) which in turn is measured by the income method.

[28] An interesting experiment related to the short-cut method has been carried out by the Economic Research Institute of the Economic Planning Agency. The direct purpose of this experiment was to compare official national income estimates by industrial origin with what is calculated from the input-output table after differences of concepts and sectors are adjusted. The comparison was made for calendar year of 1955 and the procedure of calculation was as follows. (1) Components of final demand in the input-output table were adjusted to relevant concepts in the national income statistics. (2) Components of final demand thus adjusted were broken down by sectors according to sector division of the input-output table. (3) Let f stand for the final demand vector, I, A and M stand for unit matrix, matrix of technical coefficient and matrix of import coefficient respectively. Then output vector (x), was calculated by the formula,
$$x=(I-A+M)^{-1}f$$
(4) Let us suppose that the ratio between sectoral national income and sectoral output is known for every sectors. Let v_i stand for the ratio for i sector. Then national income of ith sector (y_i) is calculated from
$$y_i=v_ix_i$$
(5) Sectoral outputs are aggregated into sectors by appropriate size. The comparison of corresponding figures of national income by industrial origin is shown in Table 2. It appears from the result that there does not exist a significant difference between the figures of national income by industrial origin derived from the national income statistics and those which are taken from the input-output table. The result also suggests that the experiment may be substituted as a short-cut method to compile the sectoral production accounts, provided that technical coefficients and import coefficients in the input-output table are fairly stable during the five year period.

TABLE 2

(milliard Yen)

	(1)	(2)	(3)
1. Agriculture	1,070	1,179	1,147
2. Forestry	238	148	265
3. Fishery	85	170	101
Primary Industry (1.+2.+3.)	1,393	1,497	1,513
4. Constructions	270	324	345
5. Mining	145	136	164
6. Manufacturing	1,581	1,521	1,778
Secondary Industry (4.+5.+6.)	1,996	1,981	2,287
7. Services, Transportations	2,775*	3,075*	3,396
8. Public Utilities	114		135
9. Miscellaneous	553	—	623
Tertiary Industry (7.+8.+9.)	3,442	3,075	4,154
Total	6,811	6,553	7,954

Notes to TABLE 2:
(1) Figures in column 1 are caluculated from the input-output table with adjustments as described above. Figures in column 2 are from national income statistics. Figures in colnmn 3 are figures directly derived from the input-output table without adjustment of concepts and sectors.
(2) *indicates figures which include government services.

Integration of National Accounts with Flow of Funds Accounts

Another among fundamental economic activities on which the integration of national economic accounts is forccused is capital formation. We have discussed in the previous section that the consolidated capital formation account is related to capital formation activity (or resting of final products activity) in national accounts. Sectoral capital transaction accounts directly follow breaking down the consolidated capital formation account. A brief design of sectoral capital transaction account for sector j is shown below.

Sectoral Capital Transaction Account

Sector j

Increase of Fixed Capital Goods	I_j	Gross Saving	S_j*
Increase of Inventories	R_j+J_j		
Depreciation Allowances	D_j		
Net Increase of Lending to other Sectors	L_j^n		

As an alternative of sectoral capital transaction account it is conceivable that it is splitted into two accounts:

Sectoral Capital Formation Account

Sector j

Increase of Fixed Capital Goods	$I_j{}^*$	Gross Saving	$S_j{}^*$
Increase of Inventories	R_j+J_j		
Depreciation Allowances	D_j		
Surplus or Deficits of Funds	Z_j		

Sectoral Financing Account

Sector j

Increase of Lending to Other Sectors	L_j	Surplus or Deficit of Funds	Z_j
		Increase of Borrowing from Other Sectors	B_j

Though the former design bears a closer resemblance to the consolidated capital formation account in the national accounts than the latter, the latter has the advantage owing to a clear cut separation of finacial transactions from real transactions. In fact, sectoral financing accounts are separately shown in the Economic Planning Agency's flow of funds accounts of Japan.

The basis of sector division in sectoral capital transactions generally differs from the one in sectoral production accounts. Consequently the jth sector in the former case is entirely different from the jth sector of the latter. As a general rule, the sector division of sectoral capital transaction accounts is based on the institutions, in particular finacial institutions. If national accounts are integrated with national balance sheet by means of sectoral capital transaction accounts, as the Figure 1 indicates, dual sector divisions of sectoral capital transactions may be a possibility, since in respect of sector divisions there may be no coordination between flow of funds accounts and national balance sheet. But it is easily pointed out that the problem of sector division in sectoral capital transaction accounts is a matter of principle, which is determined unambiguously.

It seems to me that the real difficulty underlying the integration of national accounts with flow of funds accounts is in the treatment of assets revaluation in sectoral capital transaction accounts. Capital assets, in particular financial objects, are subject to volatile price changes, and a distribution of assets and liabilities of a particular sector is dependent more or less on price changes.

Therefore decisions on selling or buying of financial objects are affected by the changes of prices. We cannot single out these price changes in recording financial transactions. So far as national accounts are concerned, they are mainly interested in the circulation of real transactions. As a consequence, little importance has been attached to the problem of how price changes of real capital goods are to be treated. One exception is inventory changes; usually they are adjusted so that part of the value of inventories due to price changes is

excluded.[29]

The adjustment of assets values to changes of price thus imposes a new problem, namely how the adjustment is to be treated within an accounting framework. In Japan very few attempts to solve the problem have ever been made. But it seems, at least to me, that the best way to solve the problem is to superimpose a new account which record the adjusted transactions. The account may be termed the assets revaluation account. The superimposition of assets revaluation account affects not only the sectoral capital transaction accounts but also the national accounts, since from the standpoint of the partial integration approach every transaction is ultimately related to the national accounts. It is therefore necessary in the first place to see the effect of the superimposition of assets revaluation account on national accounts.[30]

National accounts must be modified by the superimposition of assets revaluation account. The modifications are shown below.

(i) National Product and Expenditure Account
$$Y + T^{id} + D + M = C_h + C_g + I^* + X - M$$

(ii) Consolidated Income Formation Account
$$\tilde{R}_g + T_c^d + W + E + \tilde{R}_h + \tilde{S}_c = Y + G$$

(iii) Assets Revaluation Account
$$G + F = A$$

(iv) Appropriation Account for Person
$$C_h + T_h^d + \tilde{S}_h + T_{hr}{}^f = W + E + \tilde{R}_h + T_{gh}{}^f$$

(v) Appropriation Account for General Government
$$C_g + T_{gh}{}^f + \tilde{S}_g + T_{gr}{}^f = T^{id} + \tilde{R}_g + T_c^d + T_h^d$$

(iv) Consolidated Capital Formation Account
$$I^* + A + \tilde{L}^n = \tilde{S}_c + \tilde{S}_g + \tilde{S}_h + D$$

(vii) Rest of the World Account
$$X = M + F + T_{gr}{}^f + T_{hr}{}^f + \tilde{L}^n$$

Increase or decrease of values of assets due to price changes of assets is shown by A, the corresponding capital gains that are attributed to the nation are G and those which are attributed to the rest of the world are F. Property incomes of the person and general government and corporate saving in (ii) change by the amount that corresponds to G. Thus R_h, R_g and S_c change to $\tilde{R}_h$, $\tilde{R}_g$, and $\tilde{S}_c$ respectively in (ii). The change of R_h to $\tilde{R}_h$ affects the amount of personal saving in (iv), so S_h changes to $\tilde{S}_h$. The same is true of the appropriation account of general government; S_g to $\tilde{S}_g$. Changes of saving items in the consolidated capital formation account and the introduction of the item A in it change the item of net lending to the rest of the world (L^n) to $\tilde{L}^n$. It is interesting to notice the fact that in national accounts item A is only relevant to change of assets values in real objects,

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[29] Adjustment of price changes in the measurement of inventory changes has not yet been made in Japanese national income statistics. But it is strongly desired that measures are taken to make the adjustment, since the role of inventory changes in recent business cycles in Japan has become to be significant. The report of Kokumin Keizai Keisan Chosa Iinkai has made the same recommendation.

[30] The idea of superimposing assets revaluation accounts on national accounts was first developed by G. Stuvel. See his "Asset Revaluation and Terms of Trade Effects in the Framework of National Accounts", *Economic Journal*, Vol LXIX, June 1959. The present attempt is a logical extension of his idea.

since the corresponding changes of values in financial assets are cancelled out in the con-solidation process.

But the superimposition of assets revaluation account on sectoral capital transaction accounts implies that not only the assets values of real objects but also those of financial objects are affected. Thus sectoral capital transaction accounts are modified owing to the introduction of capital gains on the credit side. It is shown below.

A Modified Form of Sectoral Capital Transaction Accounts

Sector j

Increase of Fixed Capital Goods	I_j	Gross Saving plus Capital Gains	$\tilde{S}_j{}^*$
Increase of Inventories	$R_j + J_j$		
Depreciation Allowances	D_j		
Changes of Assets Values	A_j		
Net Increase of Lending to other Sectors	$\tilde{L}_j{}^n$		

In conclusion, a comment is required for the item $L_j{}^n$ in sectoral capital transaction accounts. As they supply informations on uses and sources of various forms of funds by sector, the liquidity structure of sectors is of central concern in sectoral capital transaction accounts. A subdivision of the item $L_j{}^n$ according to the degree of liquidity will, accordingly throw a new light on the analytical use of sectoral capital transactions. Many things to elaborate sectoral capital transaction accounts following this line of thoughts are left un-touched. These are to be dealt with in another article.[31]

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[31] Some of them may be pointed out here. One ploblem is how stocks of assets, both of real and financial objects, are to be valued and adjusted to capital formation measured as the difference of values of real capital stocks between the end and the initial point of a period. The difference in the basis of recording transactions, such as the one between the payable-receivable basis and the cash basis, is another that call for penetrating discussion.