This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The Design of Economic Accounts

Volume Author/Editor: Nancy D. Ruggles and Richard Ruggles

Volume Publisher: UMI

Volume ISBN: 0-87014-204-6

Volume URL: http://www.nber.org/books/rugg70-1

Publication Date: 1970

Chapter Title: CLASSIFICATION SYSTEMS AND INTEGRATED ECONOR ACCOUNTS

Chapter Author: Nancy D. Ruggles, Richard Ruggles

Chapter URL: http://www.nber.org/chapters/c3342

Chapter pages in book: (p. 77 - 93)

5 CLASSIFICATION SYSTEMS AND INTEGRATED ECONOMIC ACCOUNTS

The integration of economic accounts requires that standardized classification systems be developed so that the data in the different parts of the economic accounting system can be directly related. The development of major economic accounting constructs does provide a general framework for the classification systems, but further deconsolidation of the accounts requires explicit consideration of a number of different interrelated classification systems.

In analyzing the integration of economic accounts, four different types of classification systems emerge as central. First, classification of products and industries is necessary, not only to show the origin and use of income and product, but to provide the basis for input-output tables, capital formation accounts, and balance sheets. Second, institutional sectoring of the economy is required to show how different kinds of enterprises, governments, and households allocate the income that they receive, and engage in financial transactions. Third, asset and liability classifications are needed for national wealth and balance sheet accounts. Finally, classification systems are needed for the various activities of governments, showing receipts in terms of types of taxes and outlays in terms of the economic nature of outlays and purposes for which such outlays are made. It should be emphasized that although these four systems of classification are different in purpose and coverage, they are highly interdependent, and should be developed in conjunction with each other.

Product and Industry Classifications

The classification of products and industries represents the most detailed and complex of the classification systems developed for economic data.

Considerable resources have been devoted to the development of such classification systems, by both the United States and the United Nations. It is beyond the scope of this discussion to evaluate or to suggest major revisions in either the US or the UN systems. It will be useful, however, to indicate some of the problems that must be borne in mind in the use of these classification systems for purposes of economic accounting.

Commodities

The classification of commodities into product groups is basic to the development of product and industry classification systems. Even the finest commodity classification is an aggregation, and the items that it embraces will differ from one another in discernible ways. How fine to make the commodity classification depends both on the importance of the particular commodities being classified and the magnitude of the differences among the commodities that are to be included in a commodity group. Commodities are differentiated on the basis of both the processes of production they involve and the uses to which they are put, and later aggregation of the basic commodity classifications may be either in terms of industrial activity or in terms of end uses. For the United States, the basic commodity classification is a 7-digit code, which collapses into a less detailed 5-digit commodity code, and into industry codes at 4-digit, 3-digit, and 2-digit levels. For the new UN revision a 3-digit classification is used, which embraces over 10,000 products and activities. The UN system is also telescoping, so that 2-digit major groups and 1-digit divisions of the economy are shown. At the present time, the UN International Standard Industrial Classification is being revised. The commodity classification for the national accounts will be based on the links between the subgroups of the Standard International Trade Classification and those of the ISIC. Although the Standard International Trade Classification provides a fairly detailed classification of commodities involved in international trade, it will be necessary to develop categories for other goods and services to obtain a complete commodity classification.

Industries

Although the commodity classifications can be grouped into broader industry classifications, and the output of the economy can be shown in terms of such industrial classifications, it does not follow that the activity of individual establishments and/or companies can be fitted into these industries. Some establishments produce a number of commodities that in the classification system are considered to be output of different industries. As a practical matter, establishments are classified in that industry that fits the largest share of their output. In analyzing the gross product originating on such a basis, however, it will be found that for any given industry composed of a given set of establishments, output will contain a certain proportion of commodities that in terms of the commodities that would be classified as belonging to a given industry will not be produced by establishments appearing in that industry.

As has been mentioned already, the treatment of input-output relations in the new UN system explicitly recognizes this problem. A dual classification is provided that shows on the one hand the supply of commodities produced by establishments classified in various industries, and on the other the commodity inputs used by establishments in different industries. From an analytic viewpoint, this distinction is very useful, and becomes more relevant as diversification within establishments becomes wider and the economic system becomes more complex. However, at major levels of aggregation most establishments do not seriously overlap into more than one category. Much of the apparent diversification in the economy comes about not at the establishment level but rather at the firm or enterprise level. In many ways, as plants become automated they may become more and more specialized and easier to classify. Publishing highly aggregated data both on the supply and use of commodities and on the gross output and input of industries may not be worthwhile, since at the published level of detail the differences between these systems of classification will not be significant; for input-output tables showing about 50 industries or less a single system of classification may be sufficient. For highly detailed data showing several hundred industries the distinction between establishment and commodity classification is pertinent, but here the mass of detail is so large that it should be handled in machine readable form. Ideally, one would like to have the distribution of specific products by kind of establishment within each industry group in this form.

The problem of industry classification becomes much more serious when companies rather than establishments are classified by industry.

Just as an establishment may produce a variety of different commodities that belong in a variety of industries, so a given company may own establishments in different industries. There are indications that this development may in the future make distributions of company activities by industry much more difficult. The US Census Bureau has recognized this problem explicitly, and has provided special studies on the nature of the industrial diversification of various companies. This evidence suggests that classification of companies by industry is only meaningful at fairly aggregative levels and that the more complex distributions of company-establishment activities will need to be provided in some machine readable form.

The company-establishment relationship is important not only in determining the industrial structure of the company, but also in analyzing the activity of the establishments themselves. To an increasing extent central offices of multiestablishment enterprises are taking over establishment functions, thus eroding the concept of the establishment and posing a problem of how central services are to be allocated to productive activity. There has been a growing tendency to pull administrative and research personnel out of the establishment and centralize them. The computer and modern communication systems permit accounting, design specification, customer relations, billing, and even payroll to be done by the central office. If the central office is considered a separate establishment, and charges are made for the services rendered on an internal bookkeeping basis, the central office function can be treated as a purchase of goods and services by one establishment from another. On the other hand, to the extent that the central office provides joint services to all establishments that are paid for out of the operating surpluses as a whole, the internal bookkeeping may not be relevant and it may be difficult to identify the industries using such services.

End Use

Commodities produced by the economic system flow into a variety of end uses. Individuals purchase goods and services to satisfy their various consumption needs. Business firms purchase durable goods for capital formation, and the government draws upon goods and services for both public consumption and capital formation. The task of providing data on the commodity flow is substantial, but it is undertaken by many countries so that the estimates of output by industrial origin will be consistent with the estimates of expenditures for final products. Both the US and the new UN systems present quite detailed classifications of the goods purchased by consumers. The types of classifications involved are similar to those used for consumer budget studies. Both systems use a dual classification that distinguishes durability as well as purpose. Thus, for example, the purchase of automobiles and gasoline would both be shown under private transportation expenditures, but automobiles would be classed as a durable good, and gasoline as a nondurable good.

End use classifications for producer durables and government expenditures are also needed. These should correspond to the classification of assets and liabilities and the classification of government activities discussed below.

Institutional Subsectoring

The industry classification systems discussed above are based upon the analysis of economic activity in terms of products and production processes. For many purposes, however, it is necessary to view economic activity in terms of decision-making units: groups that have legal forms of organization and play a major role in determining the transaction flows in the economy. Such subsectoring of the economy for the analysis of income and outlay flows and capital transactions is quite different from the industrial classification used to analyze productive activity; it reflects institutional rather than technological characteristics, and is based upon the recognition of income recipients and ownership units. Only individuals and legally recognized entities can receive income, engage in financial transactions, and have balance sheets.

In presenting data for the United States, the OBE uses the following general institutional classification:

Business Corporate Sole proprietorships and partnerships Other private business Government enterprises General government Households and nonprofit institutions Rest of the world

National income originating is shown for each of these major institutional sectors classified into compensation of employees, interest, profit, or other income arising from the sector. For some components (e.g., profits and income of unincorporated enterprises), the OBE also provides

a further breakdown of the corporate and noncorporate sectors of the economy into 16 broad industry groups. For government, receipts and expenditures accounts are shown separately for the federal and the state and local levels.

The Federal Reserve Board has developed a related but somewhat more specialized institutional sectoring for presenting information on financial transactions, as shown below.

NONFINANCIAL Rest of world General government US government State and local government Private domestic nonfinancial Households Nonfinancial business Corporate Noncorporate Farm Nonfarm FINANCE Banking system Monetary authorities Commercial banks Nonbank finance Savings institutions Saving and loan associations Mutual savings banks Credit unions Insurance Life insurance Other insurance companies Private pension funds Finance not elsewhere classified Finance companies Security brokers and dealers Open-end investment companies Agencies of foreign banks Banks in US territories and possessions

Although the Federal Reserve classification matches the OBE major sectoring, the detail presented differs substantially. The FRB does not provide any breakdown by industry of the corporate nonfinancial sector, and similarly the OBE does not provide the detailed financial sectoring of the economy.

The basic approach of the new UN system to institutional sectoring for income and outlay and capital finance accounts is similar, as shown on the following page. Nonfinancial corporate and quasi-corporate Financial institutions General government Private nonprofit institutions Households, including private nonfinancial unincorporated enterprises

The major differences between this and the US system are that even in the basic income and outlay accounts the distinction between financial and nonfinancial enterprises has been introduced, private nonprofit institutions have been removed from the household sector, and private nonfinancial unincorporated enterprises have been placed in the household sector. To a considerable degree these differences arise because the revised UN system provides capital finance accounts for all the sectors for which income and outlay accounts are provided. Like the OBE, the new UN system provides industry detail within the institutional sectoring for some 23 industries. Households and private nonfinancial unincorporated enterprises are further broken down to show agriculture, nonagricultural unincorporated business, employees, and persons in other status. Under general government, additional detail is given for central, state, and local governments, social security funds, and other public institutions.

As in the US flow-of-funds accounts, the UN shows additional detail for financial institutions. The institutional subsectoring used for financial transactions accounts is shown below.

I. NONFINANCIAL ENTERPRISES Private Public **II. FINANCIAL INSTITUTIONS** Central bank Other monetary institutions Private Public Insurance companies and pension funds Private Public Other financial institutions Private Public. **III. GENERAL GOVERNMENT** Central government State and local governments Social security funds Other institutions

IV. PRIVATE NONPROFIT INSTITUTIONS SERVING HOUSEHOLDS

V. HOUSEHOLDS
 Proprietors of nonfinancial unincorporated enterprises included in
 the sector, except owner-occupied dwellings

Employees
 Persons in other status

VI. REST OF THE WORLD

Both the US and the revised UN systems thus exhibit apparent conflicts in the institutional sectoring of the economy for purposes of analyzing the generation and allocation of income, on the one hand, and the financing of capital formation and the role of financial institutions. on the other. For analyzing income flows, industrial elements must be introduced into the institutional sectoring to show how important different sectors of the economy are in the generation of income and to examine the rates of profits that are being earned. But financial institutions as such may be relatively unimportant since they generally are not major income producers. The sectoring of the OBE is directly oriented to this purpose. To analyze financial interrelationships, however, considerably greater detail has to be provided for the financial sectors, as has been done by the Federal Reserve. Unfortunately, the greater detail provided by the OBE in terms of institution and industry is not carried over into capital formation or financial transactions accounts, so that the financing of capital formation by the major producing sectors of the economy cannot be analyzed. For example, the financing of capital formation in the public utility, contract construction, and corporate manufacturing sectors differs considerably, and an understanding of the operation of the economy requires information of this type.

The UN system more fully meets this objective, since the institutional-industry sectoring that it develops for its income and outlay accounts also provides information on capital finance for the same sectors. The expansion of the UN system for the analysis of financial transactions is considerably more limited than that provided by the Federal Reserve Board, and in these accounts the nonfinancial sector is split into only two subsectors, private and public. Insofar as financial transactions are directly related to the allocation of income, the financing of capital formation, and the changes in balance sheets, it would seem more appropriate to provide considerably greater subsector detail for the financial transactions accounts of nonfinancial enterprises.

With respect to the treatment of the household sector, it does seem appropriate that nonprofit institutions should be excluded from

The Role of Classification Systems 85

the household sector; but the inclusion of unincorporated nonfinancial enterprises as part of the household sector should be seriously questioned. It is, of course, difficult to separate the household account and the enterprise account of an unincorporated enterprise. However, such a separation has already been made on the production side of the current accounts for unincorporated enterprises. Purchases of goods and services for operating the business have been separated from household expenditures, and unincorporated income has been computed as the income of the business accruing to the household. It does not seem unreasonable that the financial transactions and even in some degree the balance sheet of the unincorporated enterprise can be separated from the household accounts. For example, the owner of a small grocery store has as assets of his business an inventory of goods for sale and an accumulation of accounts receivable from his customers, and as liabilities accounts payable to wholesalers and perhaps even a note on his accounts receivable held by the local bank. Under such circumstances it is possible to compute an equity in the business that is obviously an asset to the owner of the business in his household capacity. This kind of separation of accounts in terms of the balance sheet is not significantly different from the separation that national income accounting makes on income and product account.

If both nonprofit institutions and unincorporated businesses are excluded from the household sector, the latter should reflect only individuals in their household capacity; it would probably be useful to introduce economic and demographic breakdowns somewhat along the lines suggested in the proposed UN system. Farm and nonfarm households of proprietors should be distinguished, as well as wage earners, professionals, and even the retired population. Although additional detailed socioeconomic groups would be useful for particular problems, it is probably true that microdata sets for the household sector could more easily provide the necessary information for finer subgroups.

In summary, therefore, a system of institutional sectoring combined with broad industrial sectoring is required for income and outlay accounts, capital formation accounts, financial transactions, and balance sheets. Furthermore, in order to provide for the analysis of the role of financial institutions in the system, the institutional sectoring will have to be expanded to show the various types of monetary and financial institutions. In order to analyze socioeconomic groups, the household

sector should be restricted to individuals in their household capacity, and major subgroups should be shown.

Asset and Liability Classifications

The classification of assets and liabilities is directly related to the product classifications used for national income accounts, the capital formation and capital stock accounts used for input-output, the financial transaction accounts, and balance sheets. Since neither the present US system nor the revised UN system provides for capital stock accounts or balance sheets, complete asset and liability classification systems have not been drawn up in either of these systems. Nevertheless, parts of the classification do exist in the national income accounts and the financial transaction accounts.

There are three broad classes of assets: (1) nonreproducible assets such as land and natural resources; (2) reproducible assets, which are created as part of capital formation in a specific period; and (3) financial assets, which by definition also represent liabilities for some other sector or group. Nonreproducible assets are not classified by either the US or UN systems. That portion of reproducible goods that consists of structures and producers durable goods is shown. For the United States these categories are spelled out in some detail, as shown in Table 4. The detail of this classification is in marked contrast with that of the new UN system, which is given below.

Residential building Nonresidential building Other construction Land improvement and plantation Land improvement Plantation, orchard, and vineyard development Transport equipment Machinery and other equipment Agricultural Other Breeding stock, dairy cattle, etc.

The importance of information on capital formation and capital stocks strongly suggests that the UN classification system needs to be substantially expanded. Much of the detail on structures will automatically be provided by the industry or institutional sector detail into which the various forms of accounts are broken down. With respect to producer

TABLE 4

The US System: Department of Commerce Asset Categories

Purchases of structures by type Private structures Residential structures New construction Nonfarm dwellings New dwelling units Additions and alterations Nonhousekeeping units Farm buildings Brokers' commissions on sale of structures Net purchases of used structures Nonresidential structures New construction Nonresidential buildings, excluding farm Industrial Commercial Religious Educational Hospital and institutional Other buildings Public utilities Railroads Telephone and telegraph Electric light and power Gas Other Farm Petroleum and natural gas well drilling and exploration All other private construction **Public structures** New construction Buildings, excluding military Residential Industrial Educational Hospital Other public buildings Highways and streets Military facilities Conservation and development

Other public construction Sewer systems Water supply facilities Miscellaneous public construction Net purchases of used structures Private purchases of producers durable equipment by type Purchases of new equipment Dealers' margins on used equipment (except passenger cars) Net purchases of used equipment from government Less: Exports of used equipment Sale of equipment scrap (except passenger cars) Furniture and fixtures Fabricated metal products Engines and turbines Tractors Agricultural machinery (except tractors) Construction machinery Mining and oilfield machinery Metalworking machinery Special-industry machinery, n.e.c. General industrial, including materials handling equipment Office, computing, and accounting machinery Service-industry machines Electrical machinery Electrical transmission, distribution, and industrial apparatus Communication equipment Other electrical equipment Trucks, buses, and truck trailers Passenger cars Aircraft Ships and boats Railroad equipment Instruments Miscellaneous equipment

durables, however, the redundancy of the classification system is much less obvious, since it is necessary to show even specialized types of equipment such as aircraft separately so that within an industry one can distinguish among the various forms of capital goods.

Since neither the US nor the revised UN system treats durable goods held by consumers as capital formation, these classifications will be found in the final consumption expenditures of households. Both the US and UN classifications seem to be quite satisfactory, and can serve as a basis for the classifications needed for the capital formation accounts and the balance sheets.

As to government assets, the US system recognizes public construction, shown in Table 4, but treats the purchase of durable goods by the government as current expenditure. There is no classification of durable goods purchased by the government in the US accounts. In the UN accounts, the same classification for type of capital goods is used for government as for other producers. In principle, this approach seems quite proper, but the classification might have to be expanded somewhat to include specialized government structures and durables (e.g., highways, dams, etc.).

For financial assets and liabilities the classification system will in large part depend upon the legal and institutional characteristics of the particular country involved. The financial asset and liability classification used by the Federal Reserve Board is shown in Table 5. The extent of detail shown here does facilitate the analysis of financial conditions. A much more abbreviated list of financial assets and liabilities is shown in the following new UN system.

Gold

Currency and transferable deposits Monetary institutions' holdings Central government's holdings Other deposits Bills and bonds, short term Bonds, long term Corporate equity securities, including capital participations Short-term loans, n.e.c. Between monetary institutions Long-term loans, n.e.c. Net equity of households on life insurance reserves and on pension funds Proprietors' net additions to investment of nonresident quasi-corporate enterprises Trade credit and advances Other financial assets

89

TABLE 5

The US System: Federal Reserve Board Financial Transaction Categories

Monetary reserves Gold Official foreign exchange position IMF gold tranche position Convertible foreign exchange at Treasury and Federal Reserve Treasury currency Deposit claims on financial institutions Demand deposits and currency Private domestic US government Foreign Time deposits at commercial banks	Corporate and foreign bonds Corporate stocks 1-to-4 family mortgages Other mortgages Consumer credit Instalment Noninstalment Bank loans, n.e.c. Other loans Open market paper Dealer-placed paper Directly placed finance company paper
Savings accounts at savings institutions Insurance and pension reserves	Bankers' acceptances Other claims
Life insurance reserves	Security credit
Pension fund reserves	Owed by brokers and dealers
Credit market instruments	Owed by others
Consolidated banking items	Taxes payable
US government securities	Trade credit
Direct and fully guaranteed	Equity in noncorporate business
Short-term	Miscellaneous
Other except savings bonds	Deposit claims
Savings bonds	Equities
Nonguaranteed agency issues	Insurance claims
Loan participation certificates	Unallocated claims and bank floats
State and local obligations	Sector discrepancies

In its more detailed presentation the UN does provide sector breakdowns within these asset categories, but it does not provide any finer classifications of asset types. Although the major classifications of the revised UN system are generally satisfactory for purposes of international comparison, the different institutional and legal arrangements in particular countries will result in considerable difference in the detailed financial asset and liability classifications.

Classification of Government Activities

Three major types of classification systems are required for government economic activities: first, taxes classified by type; second, the outlays of the government classified by types of expenditure, i.e., purchases of

TABLE 6

The US System: Government Receipts Categories

goods and services, payment of employees, subsidies, etc.; and a third classification of the purpose or function of outlays.

The breakdown of government receipts by type is essential for integrating the government budget with the national income accounts. The United States provides this kind of detail for federal, state, and local governments, as shown in Table 6. As currently presented, the revised UN system does not provide the same kind of detailed information on government receipts. The proposed classifications are shown below.

Operating surplus Withdrawals from entrepreneurial income of quasi-corporate government enterprises Property income Interest Dividends Rent Casualty insurance claims Indirect taxes Import duties Other indirect taxes Social security contributions Other direct taxes on income Compulsory fees, fines and penalties Current transfers, n.e.c., from the rest of the world Current transfers, n.e.c., from the rest of the world

Although the types of taxes levied by different countries differ substantially, it does appear that the UN classification system places far too much emphasis on the nontax aspects of government receipts, and far too little on the nature of taxes.

With respect to expenditures, the primary difference between the US and the new UN systems is that the US does not recognize either capital formation or capital transactions by the government. The major categories of government expenditure used in the US accounts are given below.

Purchases of goods and services Transfer payments and net interest paid Grants-in-aid to state and local government Subsidies less current surplus of government enterprises

In contrast, the UN shows the following classifications.

Consumption expenditure Subsidies and other noncontractual transfers Gross capital formation Capital transfers Loans made, net acquisitions of bonds and corporate equity securities, and net addition to investment of quasi-corporate government enterprises

In considering these alternatives, it should be borne in mind that these classifications are normally used in conjunction with information on the expenditures by government on specific programs and purposes. While cross-classifications do become cumbersome, information for the government sector should be produced as part of its normal budgeting and bookkeeping practices; such information is required to assess the nature and impact of specific government programs upon the economy. In light of this, these classifications need to be expanded to provide more information on the exact types of expenditures made. For example, a further separation into purchases from enterprises and compensation of government employees would be useful in showing the degree to

TABLE 7

The US System: Government Expenditures Categories

National defense Military services and foreign military assistance Atomic energy development Other Space research and technology General government General administration General property and records management Central personnel management and employment costs Net interest paid Other International affairs and finance Conduct of foreign affairs and informational activities Foreign economic assistance and other transfers Education Elementary and secondary Higher Other Health, labor, and welfare Health and hospitals Sanitation Social security and special welfare services Public assistance and relief · Unemployment benefits Old age and retirement benefits Other Civilian safety Police Fire Correction

Labor Veterans benefits and services Education, training, and other benefits Disability and pension allowances Insurance Hospitals and medical care Administration and other services Commerce, transportation, and other services Regulation of commerce and finance Transportation Highways Water Air Housing and community development Urban renewal and community facilities Public housing Public utilities Transit Electricity Water and gas Postal services Other Agriculture and agricultural resources Stabilization of farm prices and income Financing farm ownership and utilities Conservation of natural resources Other services Natural resources Conservation and development of resources Recreation

which the various programs are carried out by the government or are contracted for outside of the government sector. Similarly, it would be useful to distinguish between subsidies to enterprises, transfer payments to individuals, and intergovernmental transfer payments.

The breakdown of government outlays by program will in large part depend upon the organization and legal structure of the government,

as well as the functional nature of the programs themselves. It will, of course, be useful in such a presentation to highlight public programs that are of major political or public interest. The present breakdown of government expenditures by type of function for the US is shown in Table 7. Although this breakdown seems quite suitable for the United States, a more general classification system is provided by the UN, as shown in Table 8.

TABLE 8

The UN System: Classification of the Purposes of General Government

- 1. General government services
 - 1.1 General administration
 - 1.2 External affairs
 - 1.3 Public order and safety
 - 1.4 General research
- 2. Defense
- 3. Education
 - 3.1 General administration, regulation, and research
 - 3.2 Schools, universities, and other educational facilities
 - 3.3 Subsidiary services
- 4. Health
 - 4.1 General administration, regulation, and research
 - 4.2 Hospitals and clinics
 - 4.3 Individual health services
- 5. Social security and welfare services
 - 5.1 Social security and assistance
 - 5.2 Welfare services
- 6. Housing and community amenities
 - 6.1 Housing
 - 6.2 Community development
 - 6.3 Sanitary services

- 7. Other community and social services 7.1 Recreational and related cultural services
 - 7.2 Religion and services, n.e.c.
- 8. Economic services
 - 8.1 General administration, regulation, and research
 - 8.2 Agriculture, forestry, fishing, and hunting
 - 8.3 Mining, manufacturing, and construction
 - 8.4 Electricity, gas, steam, and water
 - 8.5 Roads
 - 8.6 Inland and coastal waterways
- 9. Other purposes
 - 9.1 Public-debt transactions
 - 9.2 Transfers of a general character to other government organs
 - 9.3 Outlays in connection with disasters and other calamities
 - 9.4 Outlays, n.e.c.