JULY 1971 / VOLUME 51 NUMBER 7 PART II

SURVEY OF CURRENT BUSINESS

ANNIVERSARY ISSUE

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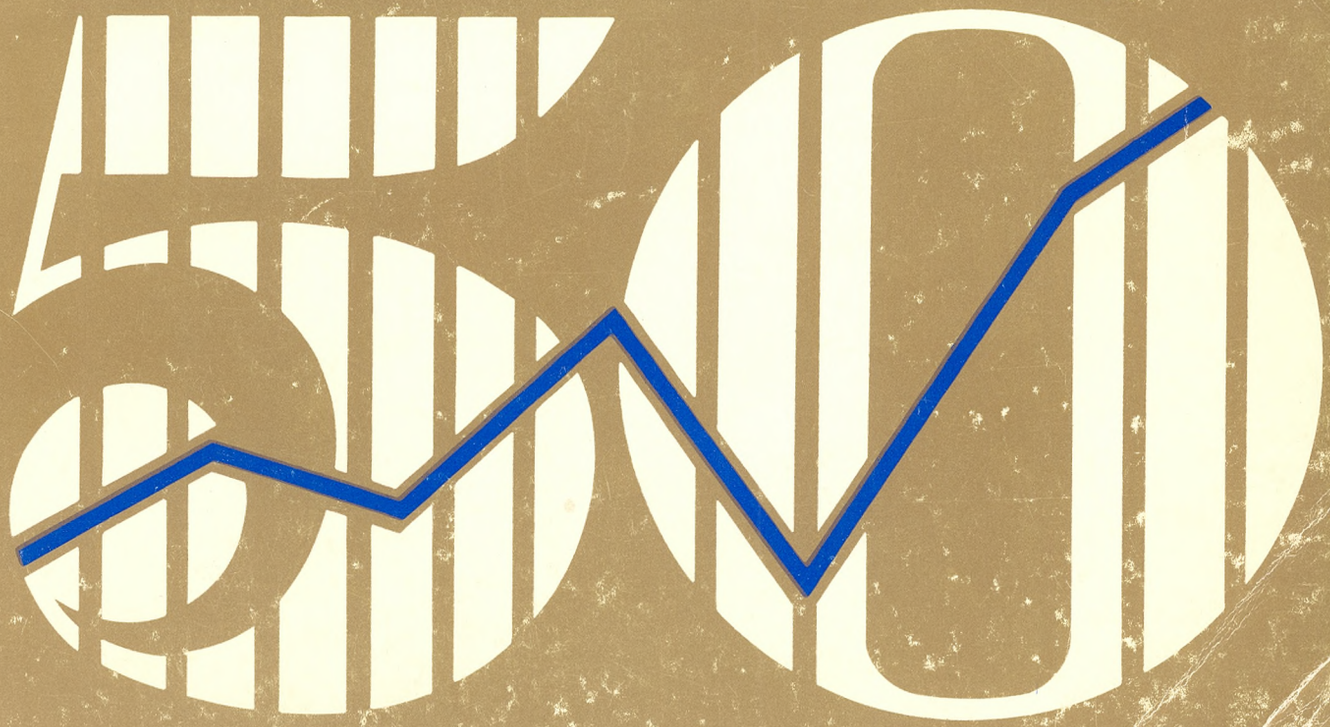

U.S.
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CONTENTS

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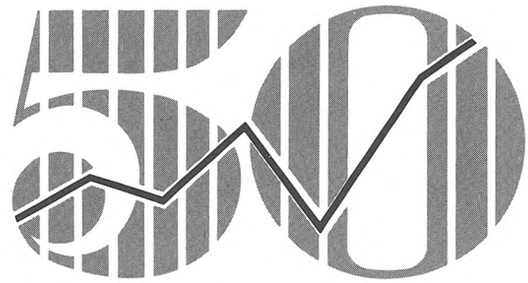

ANNIVERSARY ISSUE

THE ECONOMIC ACCOUNTS OF THE UNITED STATES: RETROSPECT & PROSPECT

U.S. Department of Commerce

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FOREWORD

The *Survey of Current Business*, whose fiftieth anniversary we are celebrating with this special issue, is the most comprehensive economics journal published by the Federal Government.

It also has a special role among all publications, including private, that dispense economic intelligence, for it is a unique source of facts about the U.S. economy and a unique source of objective interpretation of these facts.

In both respects, the monthly *Survey* has registered continuing progress and its marks are high.

The *Survey* is a major product of its publisher, the Office of Business Economics.

OBE is one of the smallest primary organizations of the Department of Commerce; it is dwarfed in size by two other agencies that provide factual information about the U.S. economy—the Bureau of the Census of the Department of Commerce and the Bureau of Labor Statistics of the Department of Labor.

But OBE's relative size is not a measure of its relative importance. Its unrivaled contribution to the Federal statistical program is that it synthesizes masses of unrelated data into a coherent picture of what the economy is all about. The industrial, regional, and international aspects of the economy, in addition to the production, distribution, and use of GNP, are all covered by this picture. The importance of the system of OBE's economic accounts, which provides the framework of this picture, is matched in importance only by the extensive information that Census and BLS compile.

OBE's economic intelligence is used not only by governmental decisionmakers. Business is equally indebted for the light that OBE throws on short-term changes and long-term trends in the U.S. economy. So are teaching and research organizations, increasing segments of the general public, and groups that feel the need for economic orientation in a complex world.

So broad is the use of OBE's economic intelligence that GNP has become a household word.

Over the years, OBE has maintained an unquestioned record for high-quality estimates and objective analyses and a continued willingness to hear criticism and to benefit from it. The last characteristic is reflected in its observance of the fiftieth anniversary of the *Survey*: it has invited outstanding users of its output to comment frankly on the past work of OBE and on the way that work might be improved.

These comments and the response of OBE to them, which make up this remarkable volume, will interest everyone concerned with the statistics of our Nation's economy.

Maurice H. Stans
Secretary of Commerce

SURVEY OF CURRENT BUSINESS

50th ANNIVERSARY ISSUE

This volume, devoted to a review of the programs of the Office of Business Economics, has been prepared to mark the fiftieth anniversary of the *Survey of Current Business*.

Credit for this volume is due, in the first instance, to the authors of the papers who have invested thought, effort, and time in preparing their discussions of our work. Next, the contributions of the OBE staff, past and present, must be acknowledged; without their labors there would have been nothing to discuss.

The directors and division chiefs of OBE are listed below. I regret that I cannot list the names of other staff members who have made comparable or greater contributions.

Morris R. Goldman, Deputy Director
Lora S. Collins, Associate Director for National Economic Analysis
David T. Devlin, Associate Director for International Economic Analysis
Robert E. Graham, Jr., Associate Director for Regional Economic Analysis
Maurice Liebenberg, Assistant Director for Econometrics
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Allan H. Young, Chief, Interindustry Economics Division
Lawrence Bridge, Chief, Business Outlook Division
Donald A. King, Chief, Current Business Analysis Division
Beatrice N. Vaccara, Chief, Economic Growth Division
Lowell D. Ashby, Assistant Chief, Regional Economics Division
Jack J. Bame, Chief, Balance of Payments Division
Frederick Cutler, Chief, International Investment Division
Vincent C. Finelli, Chief, Computer Services Division
Philip A. Tucker, Chief, Management Services Division

I must be selective also in my references to former staff members. I want to mention my predecessor, the late M. Joseph Meehan, who unfailingly maintained the professional integrity of OBE and who never allowed the Office to do nonsense work; Milton Gilbert, who had a genius for discovering and attracting good ideas and good people; Edward F. Denison, whose strong, discriminating intellect and statistical ingenuity and thoroughness built a firm foundation for OBE; Charles F. Schwartz, whose balance of extraordinary professional and human qualities was the mainstay of the Office for many years; Irwin Friend, whose excellence as economist and statistician is reflected primarily in our investment surveys; John W. Kendrick, whose productivity and talent for cooperation are embodied in our "real" GNP estimates; Louis J. Paradiso, whose versatility, enthusiasm, and imagination enlivened our business analysis program and secured us many friends; Walther Lederer, whose immense technical knowledge and self-reliance imparted a special direction to OBE's balance of payments work for many years; Murray F. Foss, whose gifts as economist and writer did much to raise the quality of the *Survey* as well as OBE's investment work; and Lawrence Grose, who made a sustained contribution as a creative and productive practical statistician.

For my part, I owe a great debt to the OBE staff not only for getting the work done but also for helping me to pursue an intellectually interesting and humanly rewarding career.

For producing this anniversary volume, I thank Ago Ambre, who coordinated a distracting multiplicity of activities with zest; Jean Owen, who edited the text with unusual competence and wit; Helen H. Jaszi, who donated the index even though she knew that her services would not be included in GNP; and Ronald W. Sterkel, who designed the volume.

George Jaszi, *Director*
Office of Business Economics

ALBERT ANDO

An Econometrician Comments on the National Income and Product Accounts

1

During the past ten years, while I have been working on the Brookings model and then on the FRB-MIT model, I have often had occasion to call on OBE with rather complex questions. I have invariably found that staff members not only were knowledgeable and helpful but also had often anticipated the objection or doubt I might have had about a particular data series. Even so, like most economists, I find an opportunity to comment on the work of others difficult to resist. This short note, then, will first offer some comments on details of the national income and product accounts and, second, will suggest construction of some experimental indices for those aspects of social welfare which cannot be reflected by any item in the present accounts.

IMPROVEMENTS IN NATIONAL ACCOUNTS

Personal Taxes as Liabilities

I begin with a comment on two issues that have been discussed fairly extensively in recent years, namely, the treatment of personal taxes and that of consumer durable goods in the national accounts. Almost all series in the accounts are on a liability basis, and personal taxes are one of the few exceptions. As I understand it, they are on a cash basis because consumer expenditure behavior is thought to respond to cash flows rather than to liabilities. I am somewhat skeptical of this proposition, but in any event I do not think that the use of the cash concept can be justified on this ground. Since personal income series exist only on a seasonally adjusted basis, we are obliged in studying consumer behavior to work with seasonally adjusted personal tax series. But if in determining their expenditures consumers are sophisticated enough to adjust their cash flows for seasonal variations, is it not reasonable to suppose that they are also sophisticated enough to think in terms of liabilities rather than cash flows?

There is an additional practical difficulty in working with seasonally adjusted cash flows of Federal personal income tax. As I have pointed out elsewhere,[1] it is extremely difficult to predict cash flow of this tax, although it is possible to do so if we are willing to introduce several rather complex equations for this purpose and to work with seasonally adjusted series. However, it is impossible to explain the seasonal adjustment. This is because the pattern of seasonal variation of the cash flow depends on the level of income in the preceding year, on the rate of change of income from two years earlier, and on changes in the provisions of tax laws in two previous years as well as in the current year. Therefore, the seasonal pattern of the cash flow is unique to the particular year.

For these reasons, I would like to see personal income taxes treated on a liability basis in the accounts. It is true that strictly speaking tax liabilities are defined only on an annual basis and that a quarterly allocation of these liabilities must be somewhat arbitrary. However, I believe that an allocation of annual personal income tax liabilities to quarters based on the pattern of income is much more defensible than is the present method of seasonal adjustment of cash flows.

Consumer Durables as Investment

The second point concerns the treatment of consumer durable goods. I feel strongly that they should be treated in the same manner as residential housing. Although there will always be some ambiguity about whether a specific item should be treated as a durable

[1] A. Ando and E. C. Brown, "Personal Income Taxes and Consumption Following the 1964 Tax Reduction," in *Studies in Economic Stabilization*, ed. A. Ando, E. C. Brown, and A. F. Friedlaender (Washington, D.C.: The Brookings Institution, 1968).

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or a nondurable good, the meaning of the word "durable" itself implies that its purchase is an act of investment and should be treated as such. Incidentally, it is my impression that the treatment of purchases of durables as investment opens up a more logical way of handling interest paid by consumers.

Measurement of Government Output

I would like to raise one more question about the national income and product accounts which has always troubled me. This is the measurement of government output. I am not here specifically referring to the often-discussed question of government services as intermediate goods, or the question of the contribution of government capital to gross national product; although mine is a somewhat related concern. As I understand it, output in the government sector is equal to the compensation of employees received in this sector. In terms of current dollars, this treatment is troublesome because it neglects the contribution of capital facilities used to provide government services and because of the nature of government services as public goods. However, in order to convert the output of the government sector into constant dollars, the current dollar figures are deflated by an index which is proportional to a wage rate. Thus, the so-called real output of government reflects essentially the man-hours worked in the government sector.

Compared to the standard procedure applied to the private sector, this treatment ignores the contribution of productive factors other than labor and the changes in productivity of labor. I am well aware of the difficulties involved in measuring the contribution to government output of factors other than labor and in defining the productivity of labor employed by government, but I think this is one case in which any approximation, however rough, is better than the assumption that the contribution of factors other than labor in government production is exactly zero, and that the productivity of government workers is the same forever. This comment applies particularly to State and local governments.

This is, of course, the sort of criticism to which experts at OBE are accustomed, and indeed they can prepare a much more penetrating set of critiques of this type than any outsider. As a constant user of data contained in the *Survey*, I have learned that I can use them fairly effectively even when I disagree with the definitions and procedures and even when the data are quite rough due to inherent difficulties of measurement and source materials, provided that I clearly understand their nature.

Description of Concepts and Methods

It is a pleasure for me to record here that, in my attempt to understand the background for various data, the cooperation and assistance I have received from staff members of OBE could not have been greater. Even so, I feel strongly that a comprehensive description of definitions and statistical procedures used in the national income and product accounts is needed. The latest such description was given in the 1954 Supplement, but even it was sometimes rather cryptic.[2] While successive modifications of the accounts have since been described in various places, it is now exceedingly difficult to ascertain the exact nature of any of the items in the accounts without the help of OBE staff members. The publication of a single volume containing detailed descriptions of all the items in the accounts would be a most welcome event for many economists and econometricians working with this vital set of data. Such a volume should include a detailed explanation of the differences between the

[2] See also National Bureau of Economic Research, *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth 22 (Princeton, N.J.: Princeton University Press, 1958), particularly the article by George Jaszi.

so-called preliminary figures and final figures, so that users of the preliminary figures can make proper allowance for the differences in data sources and methods of derivation.

WELFARE MEASURES

National income and product accounts are obviously indispensable as a way of describing the behavior of the economy, and my comments thus far have been directed mainly to this aspect of their function. In addition, some measure of national income is often used as a rough index of social welfare by both economists and the general public, although the literature on welfare theory indicates that it is in general impossible to construct a single index of social welfare and that, in the strict sense, no measure of national income can serve such a purpose.[3] In practice, a national income aggregate is supplemented in its role as a welfare measure by a few other indices, such as unemployment and the rate of inflation. This is done without much assistance from the recent theoretical literature on economic welfare, perhaps because the latter tends to be extremely abstract and does not appear to offer any practical guidelines.

This is unfortunate because the theory of welfare can provide, at least, potentially, a little more guidance on the choice of indicators of welfare than it appears to do. While this is not the proper place to investigate this topic, I suggest the following items as a partial list of other factors for which some indices are needed for the purpose of supplementing national income aggregates in their welfare aspect:

(1) Some measure of income and wealth distribution, in particular, some measure of the number of "poor" people whose income is below some specific level *and* whose net worth is negligible. A measure of the distribution of income alone is not enough. If data on the distribution of wealth are too difficult to obtain on a continuous basis in the immediate future, then data on the distribution of consumption would be far superior to those on the distribution of income.

(2) A breakdown of output into private goods and services, on the one hand, and public goods and those with marked externalities, on the other. Private and social costs and benefits of public goods tend to diverge from each other, and the current procedures for measuring them in the national income accounts are thus particularly inappropriate.

(3) Some measure of the loss of natural resources, particularly those which do not have market value.

(4) Some measure of environmental conditions such as air and water pollution.

These are obviously very difficult things to summarize by indices. But in the absence of readily available indices for these important aspects of economic welfare, political decisionmakers and the public find it difficult to discuss them, and they tend to be neglected. In their place, such measures as the rate of change of some price index, which at best is a very indirect indicator of income distribution and perhaps of other aspects of welfare, tend to dominate the policy discussions merely because they are readily available.

I would very much like to see some of the expertise available at OBE devoted to the development of indices for those aspects of social welfare which cannot be incorporated into national income aggregates. Cooperation among various Government agencies would be essential. OBE could take the initiative in this extremely difficult task by publishing a series of articles dealing with these problems in the *Survey*.

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[3] See, for example, P. A. Samuelson, "Evaluation of Real National Income," *Oxford Economic Papers*, New Series, 2 (January 1950) :1–29; "The Evaluation of 'Social Income': Capital Formation and Wealth," in *The Theory of Capital*, ed. F. A. Lutz and D. C. Hague (New York: St. Martin's Press, for the International Economic Association, 1961).

EDWARD M. BERNSTEIN

2

Fifty Years of U.S. Balance of Payments Statistics

THE STATISTICAL BASE

The First Ten Years

Balance of payments data of some types are among the earliest statistics collected by governments. For several generations economists in this country and abroad have analyzed the international payments data, testing their relationship to money flows and to prices and incomes; until fifty years ago, however, they had to work without a full, systematic and regular presentation of the balance of payments of the U.S.

World War I brought a realization in this country of the enormous strength and importance of the U.S. in the world economy. In 1919 the newly formed Harvard University Committee on Economic Research published a study of the international trade and payments of the U.S. This study included a condensed balance of payments for the periods 1850–73, 1874–95, 1896–1914, and July 1, 1914 to December 31, 1918.[1] It underlined the relation between the balance of payments and the behavior of the economy and the need to collect, publish, and analyze the balance of payments data. With Herbert Hoover as Secretary of Commerce, it was inconceivable that the Government, and particularly his Department, would neglect this new task. The first annual balance of payments report was issued in 1923 and provided the data for 1919 to 1922.[2]

The most difficult problem then, as now, was to get the facts. The meticulous collection of data and their adjustment to balance of payments concepts were required. It is remarkable that the Commerce Department was able to present such full and detailed reports with a high degree of accuracy during the 1920s. Of course, there is only indirect evidence of the accuracy of these early reports. The most recent balance of payments statistical supplement to the *Survey of Current Business* (revised edition, 1963) provides annual data back to 1919. A comparison of the revised balance of payments of 1926 in this supplement with the balance of payments as published at that time shows very few large revisions. This may be because the revised balance of payments is to a considerable extent, but not entirely, based on the original data. The discrepancy due to errors and omissions (the term used in the 1920s) was relatively small, although that may merely mean that most of the errors and omissions offset each other. Perhaps more persuasive is the fact that no major discontinuities appeared in the individual series as new and fuller data became available in the 1930s. Table 1 below shows the balance of payments of 1926 as originally published and as given in the revised balance of payments supplement. Some of the original data have been shifted to conform to present classifications.

[1] Charles J. Bullock, John H. Williams, and Rufus S. Tucker, "The Balance of Trade of the United States," *Review of Economic Statistics*, prelim. vol., No. 3, July 1919.

[2] Trade Information Bulletin 144, supplement to *Commerce Reports*, published by the Bureau of Foreign and Domestic Commerce, September 14, 1923. The report was prepared under the direction of Grosvenor M. Jones, Chief of the Division of Finance and Investment, in cooperation with Professor John H. Williams of Harvard. The statistical work was largely done by Edward P. Herman, and the analysis and preparation of the data for publication were the joint work of Professor Williams and Dr. Rufus S. Tucker. Annual reports were issued as separate publications of the Bureau of Foreign and Domestic Commerce and, later, the Office of Business Economics. The first regular report on the balance of payments published in the *Survey of Current Business* was in the issue of July 1946.

Table 1.—U.S. Balance of Payments of 1926, Original and Revised Data

[Millions of dollars]

	Original[1]	Revised
Exports of goods and services	6,423	6,381
Merchandise, adjusted	5,038	4,922
Income from investments, private	735	793
Income from investments, U.S. Government	160	160
Other services	490	506
Imports of goods and services	-5,939	-5,555
Merchandise, adjusted	-4,590	-4,500
Income on investments	-228	-200
Other services	-1,121	-855
Remittances, net	-333	-381
Capital	-203	-277
U.S. capital, net	-691	-857
U.S. Government (war debt)	35	30
Foreign capital	453	550
Gold [U.S. purchases (—)]	-98	-93
Errors and omissions, net	150	-75

[1] The major reclassifications of the 1926 data are the shift of the principal of war debt receipts from the current account to the capital account, the shift of U.S. paper currency from gold and currency to the capital account, and the inclusion of net change in international banking accounts in the capital account.

Sources: Bureau of Foreign and Domestic Commerce, *The Balance of International Payments of the United States,* Trade Information Bulletin 503 (Washington, D.C.: U.S. Government Printing Office, 1927), p. v.; and Office of Business Economics, *Balance of Payments, Statistical Supplement,* rev. ed. (Washington, D.C.: U.S. Government Printing Office, 1963), p. 1a.

As the early reports show, every possible source of information was used to compile the data or to serve as a basis for estimating the data. Where no published statistics were available, original sources of information were tapped, with a remarkable response from business, banks, and philanthropic institutions. These data were arranged in a logical economic order. The first balance of payments report had a very accurate classification of "invisible items" showing what was to be included in current account and in capital movements. It described in detail, with accompanying tables, how the data were derived for trade, interest income, ocean freight payments, immigrants' remittances and relief, tourist expenditures abroad, U.S. Government receipts and expenditures, and the movement of capital. An interesting feature of the first balance of payments report was the special effort made to estimate changes in accounts receivable from foreigners and accounts payable to foreigners. This was done through a questionnaire sent by the Commerce Department to about 1,500 banks, trading concerns, and manufacturing companies engaged in exporting.

Improving the Data

New detail was added constantly to improve the usefulness of the balance of payments and to minimize the errors and omissions. The 1926 report "added more than 20 invisible items not hitherto taken into ac-

Edward M. Bernstein is President, EMB (LTD.), Research Economists.

count," and further adjustments were made in the trade data, including an allowance of $40 million for bootleg liquor imports. For this fifth report, a special effort was made to obtain actual statistics, rather than mere estimates, of foreign deposits in U.S. banks, U.S. deposits in foreign banks, and international transactions in domestic and foreign securities previously issued. This was done in collaboration with the Federal Reserve Board and private financial institutions. The data provided by the most important international banks showed foreign deposits of about $1,443 million at the end of 1926. This moved Secretary Hoover to remark in his foreword that "we are now a great short-term debtor nation, along with our position as a great creditor nation in long-term investments."

The process of improving the data has never stopped. At the end of 1934, the Treasury and the Federal Reserve Banks began to collect data on capital movements—claims and liabilities reported by banks and corporations and transactions in securities reported by brokers. In the 1940s and 1950s, quarterly data and data by geographic areas were added to the regular presentation of the balance of payments. In addition, the Bureau of Foreign and Domestic Commerce and its successor, the Office of Business Economics, provided a steady stream of special studies of U.S. direct investments in foreign countries, foreign investments in the U.S., international insurance transactions, tourist expenditures, and currency movements, apart from the routine work of improving the data on other items in the balance of payments. Today the *Survey* provides a greater quantity and variety of detailed balance of payments data, including those in special articles, than is published by any other country.

The Review Committee for Balance of Payments Statistics—not inclined to be lenient in evaluating the quality of the statistics—said in the letter transmitting its report: "We have found that the high regard in which the official U.S. balance of payments statistics are held, both in this country and abroad, is well deserved." However, this did not restrain the Committee from calling for "more accurate and detailed balance of payments statistics, and for improved presentation and fuller analysis of them." [3] It says a good deal for the Office of Business Economics that it has accepted such criticism in an objective spirit, and while it has not always followed the suggestions offered, it has steadily sought better ways of presenting the balance of payments data. The recent revision, published in the June 1971 number of the *Survey*, includes the most far-reaching changes in the presentation of U.S. balance of payments statistics in the past half century.

FORM AND PRESENTATION

Historical Changes

The balance of payments has many uses. It provides statistics for the economist and serves as a basis for policy decisions by the monetary authorities. In its simplest form, the balance of payments is a statement of the sources and uses of foreign exchange. The emphasis on the exchange market aspect of the balance of payments, frequently revived in recent years, is to be found in a number of the earlier reports. The introduction to the 1937 report, for example, states that "one of the basic purposes of the balance of payments schedules [is] to show the sources of the supply of foreign currencies or of foreign exchange arising out of claims against foreigners, and the nature of the demand for foreign currencies from persons with payments to make abroad." If this were the sole economic significance of the balance of payments, it would not matter very much how

[3] The Review Committee for Balance of Payments Statistics was appointed in April 1963 and made its report in April 1965. The members of the Committee were Professors Richard E. Caves, Harry G. Johnson, and Peter B. Kenen and Messrs. George Garvy, Walter E. Hoadley, Roy L. Reierson, Charles F. Schwartz, and Edward M. Bernstein. John E. Reynolds of the Board of Governors of the Federal Reserve System was staff director. The report was published by the U.S. Government Printing Office.

Table 2.—Form of Balance of Payments Statements, 1926 and 1937

1926	1937
Miscellaneous items:	Trade and service items:
Merchandise, adjusted	Merchandise, adjusted
Freight	Freight and shipping
Tourist expenditures	Tourist expenditures
Ocean-borne passenger traffic	Immigrant remittances
Investment income, longterm	Charitable and other contributions
Short-term interest and commissions	Interest and dividends
Immigrants' remittances	War debt receipts
War debt receipts, interest and principal	Other Government transactions
Other Government receipts and payments	Miscellaneous services
Charitable and missionary contributions	Total trade and service items
Motion picture royalties	
Insurance transactions	Gold and silver:
Miscellaneous minor items	Gold exports and imports
Total of current items	Gold earmarking operations, net
	Silver exports and imports
Movement of private, funded capital:	Total gold and silver movements, net
New U.S. investments abroad	
Changes in previous investments abroad	Capital items:
New direct investments by foreigners	Longterm capital movements
Changes in previous investments in U.S.	Movements of short-term banking funds, net
Total of private funded capital items	Miscellaneous capital items, net
	Paper currency movements, net
Pure-cash items:	Total capital items, net
Gold	
U.S. paper currency	Other transactions and residual[1]
Total gold and currency	
Unfunded items:	
Net change in international banking accounts	
Discrepancy, due to errors and omissions	

[1] Includes unreported stabilization fund operations and other transactions not exactly reflected for balance of payments purposes in the reported figures.

the items were classified and the statement presented. After all, a capital outflow has the same effect on the exchange market as an import of goods.

While the early balance of payments reports gave very considerable detail on the items included (data now usually relegated to supplementary tables), they were not always systematic in their classifications. In the 1926 balance of payments, for example, some items with a close economic affinity were presented far apart. Capital items were scattered through all four major headings: war debt receipts (principal) in the current items; longterm private investment, properly, under a heading of its own; U.S. paper currency in the "pure-cash" items with gold; and net change in international banking accounts (claims and liabilities) in the so-called "unfunded" items, along with errors and omissions. In these respects the 1926 report, despite its greater detail, was inferior to previous reports. By the 1930s, however, the balance of payments statement began to approximate the present form. The change that occurred in these ten years can be seen from a comparison of the headings and items of the 1926 report (the numerous subheadings are omitted) with those of the 1937 report.

Significance of Presentation

There are two reasons for being concerned about the classification and presentation of the balance of payments. First, the enormous volume of transactions in goods, services, transfers, and capital affect the economy and the monetary system of the U.S. and the rest of the world. In 1970, the value

of the goods and services exported by the U.S. ($62.2 billion in the national accounts) exceeded that of residential construction ($29.1 billion) plus the gross automobile product ($30.9 billion). Net exports of goods and services are one of the constituents and determinants of the gross national product, and net exports of goods and services excluding foreign investment income have a direct and indirect effect on domestic production (gross domestic product). The capital flows amount to tens of billions of dollars and have a great impact on domestic and foreign money and capital markets. All payments and receipts, with some exceptions, affect the money supply of the U.S. and of other countries. These considerations would argue for presenting the balance of payments in a form that would facilitate the determination of its relation to the gross national product, the gross domestic product, net foreign investment, and the money supply.

The second reason for being concerned about classification and presentation is the effect of the balance of payments on the reserve position of the U.S. and the rest of the world. Where a country is gaining or losing reserves or incurring reserve liabilities on a large scale and over an extended period, its international payments position is untenable and it is headed for trouble. The balance of payments, therefore, should be presented in a form that will facilitate the identification of the payments problem and its analysis. This is, in fact, the primary justification for collecting and publishing the balance of payments data. Unfortunately, there is a considerable difference of opinion as to the most useful form for presenting the balance of payments in order to serve this purpose.

There is no necessary conflict between presenting the balance of payments in a form that will show the effect of international transactions on the economy and the monetary system and in a form that will facilitate analysis of the payments problem. These two purposes can be reconciled to a considerable extent by showing several partial balances, although obviously there is a limit to the number of balances that can be published, and some must inevitably be omitted. As the 1937 report stated: "The uses to which a summary statement of the balance of international payments of a country may be put are so varied that it is difficult to devise a method of presentation that suits every purpose and every convenience." It then went on to say that it should not be inferred "that the present classification of the various items entering the balance of payments of the U.S. is fixed and final." And it concluded with the practical observation that "the items shown in the summary statement are reported elsewhere in sufficient detail to make possible almost any conceivable reclassification of items for virtually any purpose." This is the proper introduction to a consideration of the extensive and very useful changes in the presentation of the balance of payments that have been introduced in the June 1971 *Survey*.

RECENT REVISIONS IN PRESENTATION

In an article on the revisions, David T. Devlin, the present Chief of the Balance of Payments Division, recognizes that there has long been dissatisfaction in Government, academic, and business circles with the traditional presentation of the balance of payments. In 1965 the Review Committee for Balance of Payments Statistics made a large number of recommendations on classification and on the measure of the overall surplus or deficit. Very few of its recommendations were accepted, although BPD did thereafter publish the official reserve transactions balance as well as the liquidity balance. The

Table 3.—Reclassification of Claims and Liabilities in the Balance of Payments

New classification	Old classification
U.S. private capital flows	Transactions in U.S. private assets
Claims reported by U.S. banks:	Claims reported by U.S. banks:
Longterm	Longterm
Short-term, nonliquid	Short-term
Short-term, liquid	Claims reported by other U.S. residents:
Claims reported by nonbanking concerns:	Longterm
Longterm	Short-term
Short-term, nonliquid	
Short-term, liquid	Transactions in foreign assets in U.S.
	Longterm liabilities reported by U.S. banks
Foreign capital flows	Other liabilities reported by U.S. private residents other than banks:
Other U.S. nonliquid liabilities to private foreigners:	Longterm
Longterm, reported by U.S. nonbanking concerns	Short-term
Short-term, reported by U.S. nonbanking concerns	Nonmarketable liabilities of U.S. Government, including mediumterm securities and longterm obligations payable prior to maturity only under special conditions:
Longterm, reported by U.S. banks	Associated with specific transactions
Longterm liabilities to foreign official agencies reported by U.S. banks	Other mediumterm securities and longterm obligations
Nonliquid liabilities reported by U.S. Government:	U.S. Treasury marketable or convertible bonds and notes
To foreign official reserve agencies	Deposits and money market paper held in U.S.
To other official and private foreigners	
U.S. liquid liabilities:	
To private foreigners	
To foreign official agencies	

new presentation is the result of a review begun last year by the Interagency Committee on Balance of Payments Statistics convened by the Office of Management and Budget.[4] The revisions that it recommended and that have been adopted are numerous and well-conceived. The revised balance of payments presentation is the most informative and useful that the Commerce Department has ever published.

Lesser Innovations

In the new standard table (*U.S. International Transactions,* now table 2), the lesser innovations involve some changes in title (e.g., "military expenditures" are now "direct defense expenditures"), the placing of items in different order (e.g., "direct investment fees and royalties" are now under "income on U.S. investments abroad"), the division of some items (e.g., "transportation" is now "passenger fares" and "other transportation"), and the consolidation of other items (e.g., "new issues of foreign securities," "redemptions," and "other transactions in securities" are now "foreign securities"). The really important change in the standard table is the reclassification of claims and liabilities in "U.S. private capital flows" and "foreign capital flows." These are now divided into "liquid" and "nonliquid," and U.S. liabilities are further subdivided into those to "foreign official reserve agencies," "foreign official agencies," and "private foreigners."

[4] The members of this Committee were: George Jaszi and David Devlin (Office of Business Economics); Donald Curtis and Philip Schaffner (Treasury); John Reynolds and Samuel Pizer (Federal Reserve Board); Marina Whitman (Council of Economic Advisers); and Julius Shiskin, Geza Feketekuty, Milton Moss, and David Hulett (Office of Management and Budget). Mr. Shiskin was chairman of the Committee.

The old standard table (table 1) showed three balances, none of which was intended to be the deficit or surplus in the overall balance of payments. The new standard table (table 2) now shows no balances whatever. The old table 3 ("U.S. Balance of Payments") showed the overall balances on a liquidity and an official reserve transactions basis. This table has been eliminated in the revised presentation. Instead, a new table 1 ("U.S. Balance of Payments Summary") has been introduced, which is analytical in character. The distinctive feature of this table is its presentation of six balances, two of which are overall balances and four of which are partial balances designed to facilitate analysis. The old liquidity balance is now shown as a memorandum item in the new table 1. The recent history of the various balances is summarized below:

Balances	*Previous Presentation*
1. Goods and services	Old table 1
2. Goods, services, and remittances	Not shown
3. Current account	Old table 1
4. Current account and longterm capital	Not shown
5. Net liquidity	Not shown
6. Official reserve transactions	Old table 3
7. Liquidity balance	Old table 3

Overall Balances

In the new presentation there are two overall balances—the net liquidity balance and the official reserve transactions balance. They are overall balances because they include virtually all recorded transactions, except those designated as settlement items, and all unrecorded transactions—net errors and omissions. In the new table 1 these two balances are shown after the inclusion of Special Drawing Rights (SDRs) as a balance of payments receipt, further evidence that they are regarded as overall balances. The old liquidity balance, which was an overall balance, is shown as a memorandum item (excluding allocations of SDRs) for historical comparisons.

The overall balance is sometimes regarded as showing the international payments position for the year or quarter. Of itself, the overall surplus or deficit in the balance of payments is only a measure of the changes in certain assets and liabilities—those of the U.S. Government, U.S. banks and other private residents (in some instances), foreign monetary authorities, and foreign commercial banks and other foreign residents (in some instances). What distinguishes an overall balance from a partial balance is not merely that it embraces more of the international transactions before striking a balance, but that particular significance attaches to the changes in the assets and liabilities which are the counterpart of such a balance.

The earliest balance of payments reports of the Commerce Department did not clearly strike an overall balance. In the balance of payments for 1919–1922, for example, exports and imports of gold and silver were included as visible items along with other exports and imports of merchandise. The 1923 balance of payments, however, had gold and silver under a heading of its own. This classification continued in the 1920s and 1930s, although in 1926 and for some years thereafter the comparable account was headed "pure-cash items" and included (but not always) paper currency and excluded (but not always) silver. The movements of gold, with or without silver and paper currency, must have been construed by some economists

as the overall balance. In a presentation of the 1930 balance of payments, where I took some liberties with the official classification, I used the heading "settlement items," which in present usage would certainly indicate a measure of the overall balance.[5] The first table in the 1930 report (Trade Information Bulletin 761)—a condensed balance of payments—actually used the term "net currency settlement" for the total of gold and U.S. currency movements, although the term does not appear in the full balance of payments for that year.

The Review Committee for Balance of Payments Statistics regarded the 1943 study by Hal Lary and associates[6] as the first Commerce Department report to present a clearly defined overall balance. In his Table II Lary shows the supply of dollars from imports, other current payments, and outflow of U.S. longterm capital, and the use of dollars for U.S. exports, other current receipts, and the inflow of foreign longterm capital. The difference (the excess of dollars used over dollars supplied) is matched by short-term capital movements, gold movement, and errors and omissions. This balance on current account and longterm capital was intended to show the underlying factors in the payments position of the U.S. It is for this reason commonly designated the "basic balance." It is open to question, however, whether it can be called an overall balance because it omits all short-term capital movements and the net errors and omissions.

The 1947 report in the *Survey* (March 1948) was written by Walther Lederer, who had enormous influence on the form of the balance of payments statement over a period of 24 years. This statement struck a balance which was designated the "net inflow or outflow of funds." It was measured by changes in the U.S. gold stock and by net movements of U.S. short-term capital abroad and of foreign short-term capital to the U.S. It resembled the basic balance, except that errors and omissions were above the line with goods and services, unilateral transfers, and longterm capital. For this reason, the net inflow or outflow of funds was closer to an overall balance. It also resembled the new "net liquidity balance," although it included nonliquid short-term private capital flows as settlement items.

The Liquidity Balance

Large and persistent distortions in the world pattern of payments always raise doubts regarding the measurement of the overall surplus or deficit. That is how the Commerce Department moved into the basic balance, then the balance on the net inflow or outflow of funds, only to shift at the end of the 1940s to a new overall "balance on foreign capital and gold." The justification for this balance was that in a period of so-called dollar scarcity, with exchange controls exercised by nearly all European governments, the resources available to foreign monetary authorities were not only the official reserves of gold and foreign exchange but all of the dollar assets, short-term and longterm, held by their residents. By the mid-1950s, when the pattern of international payments was different, BPD moved gradually to an overall balance measured by changes in gold and liquid dollar assets, rather than gold and total dollar assets. With various modifications, this liquidity balance remained the principal measure of the overall deficit until the present revision.

The Review Committee for Balance of Payments Statistics had serious objections to the liquidity balance. The first objection was

[5] E. M. Bernstein, *Money and the Economic System* (Chapel Hill: University of North Carolina Press, 1935), p. 393.

[6] Hal B. Lary and associates, *The United States in the World Economy: The International Transactions of the United States during the Interwar Period*, Bureau of Foreign and Domestic Commerce Economic Series 23 (Washington, D.C.: U.S. Government Printing Office, 1943).

the asymmetry which exaggerated the U.S. payments deficit. "Among U.S. assets, the BPD places below the line, as an element of change in the U.S. liquidity position and as an item helping to settle the overall balance, only changes in the reserve assets of U.S. monetary authorities. But among U.S. liabilities, the BPD places below the line all liquid U.S. liabilities to foreigners." [7] The early rationalization for this asymmetrical treatment of private liabilities and private claims was that foreign private holdings of dollars could be acquired by foreign monetary authorities and be converted into gold. On the other hand, U.S. private holdings of other currencies could not be acquired by the U.S. monetary authorities and, in any case, were not as liquid as dollars, as some currencies were inconvertible. In the past ten years, when all major currencies have become convertible, when many of them have been as strong as the dollar, or stronger, this distinction in the liquidity balance between foreign private holdings of dollars and U.S. private holdings of liquid claims in other currencies has had no economic validity.

A second objection to the liquidity balance was the exclusion from the settlement items of nonliquid liabilities of the U.S. Government to foreign official reserve agencies and nonliquid liabilities of U.S. banks to foreign official agencies. Insofar as the nonliquid obligations of the U.S. Government encouraged foreign official reserve agencies to hold claims on the U.S. Government instead of converting them into gold, there was a good practical reason for issuing such securities. The exclusion of such liabilities from the settlement items by classifying them as capital inflow had no economic justification. In fact, all this did was to reduce the liquidity deficit without improving the payments position. There is a reasonable case, however, for treating as capital inflow certain liabilities to foreign governments the proceeds of which are committed to purchases in the U.S.

A third objection was that the liquidity balance, if universally followed, would result in an understatement of the surplus and an overstatement of the deficit of every country. As the Review Committee said: "In a world where leading countries increasingly consult together to assess the problems and responsibilities of surplus and deficit countries and deal with the problems in a coordinated way, it is helpful if one country's surplus (or deficit) can be seen to have a counterpart in deficits (or surpluses) of other countries." This is not true of the liquidity balance. If all countries regard the increase in their liquid liabilities as settlement items but treat the increase in their liquid claims as capital outflow, the total of all deficits will exceed the total of all surpluses by the amount of the increase in aggregate liquid claims or liquid liabilities. It is this downward bias, which causes the asymmetry, that is the major objection to the liquidity balance.

Net Liquidity Balance

The net liquidity balance, introduced with other revisions in the June 1971 *Survey*, is a striking improvement over the old liquidity balance. It treats reported U.S. liquid claims of banks and nonbanking concerns and their liquid liabilities to private foreigners in precisely the same way. It ends the distinction made for balance of payments purposes between liquid and nonliquid liabilities of the U.S. Government to foreign official reserve agencies. In these respects, the net liquidity balance presents a far more accurate statement of the payments position

[7] *The Balance of Payments Statistics of the United States, a Review and Appraisal* (Washington, D.C.: U.S. Government Printing Office, 1965), pp. 106–9. Other leading opponents of the liquidity balance included Hal Lary, Walter Gardner of the IMF, and Professor Charles Kindleberger, although their objections were not in every respect the same.

Table 4.—Comparison of U.S. Balance on Three Bases, 1964–70

[Millions of dollars]

	1964	1965	1966	1967	1968	1969	1970
1. Reserve transactions balance	–1,534	–1,289	219	–3,418	1,641	2,702	–9,821 [1]
2. Net liquidity balance	–2,745	–2,493	–2,148	–4,685	–1,610	–6,084	–3,852 [1]
3. Liquidity balance	–2,800	–1,335	–1,357	–3,544	172	–6,958	–3,854 [1]
4. Liquid claims of U.S. residents	–343	1,073	–17	–205	–559	124	273
5. Liquid liabilities to private foreigners	1,554	131	2,384	1,472	3,810	8,662	–6,242
6. Total (4 + 5)	1,211	1,204	2,367	1,267	3,251	8,786	–5,969
7. Liquid claims of U.S. residents	–343	1,073	–17	–205	–559	124	273
8. Nonliquid liabilities, official [2]	288	85	808	1,346	2,340	–998	–275
9. Total (7 + 8)	–55	1,158	791	1,141	1,781	–874	–2
10. Reserve transactions balance minus net liquidity balance (= 6)	1,211	1,204	2,367	1,267	3,251	8,786	–5,969
11. Liquidity balance minus net liquidity balance (= 9)	–55	1,158	791	1,141	1,781	–874	–2

[1] Includes allocations of SDRs.

[2] Nonliquid liabilities to foreign official reserve agencies reported by U.S. Government and nonliquid liabilities to foreign official agencies reported by U.S. banks.

of the U.S. than the old liquidity balance. From 1964 to 1970 the net liquidity deficit averaged $560 million a year more than the old liquidity deficit. This is almost entirely because of the inclusion of certain official nonliquid liabilities in the settlement accounts of the net liquidity balance. In 1969, and marginally in 1970, the net liquidity deficit was smaller than the old liquidity deficit, mainly because of the reduction of the nonliquid liabilities of U.S. banks to foreign official agencies (longterm Certificates of Deposit). Despite some very important advantages, there are a number of weaknesses in the net liquidity balance.

In principle, the net liquidity balance should be symmetrical in the U.S. balance of payments and in the payments of other countries. In practice it is not because the errors and omissions are likely to contain more unreported U.S. liquid claims than unreported U.S. liquid liabilities. Therefore, the true net liquidity balance is understated—the U.S. deficit is overstated. The overstatement can be very large when the errors and omissions average a billion dollars a year, as they have in the past ten years, and amount to nearly $4 billion in two years (1969 and 1970). A similar understatement of the surplus would appear in a *net liquidity balance* of foreign countries. The liquid claims in their own errors and omissions will not be reported, but an inflow of liquid funds from the U.S., even when not reported in this country, is likely to be included in reported liabilities, at least to the extent that they are in the form of claims on banks. Table 4 below shows the U.S. deficit (or surplus) as it is under the old liquidity balance, the net liquidity balance, and the official reserve transactions balance.

Official Reserve Transactions Balance

The final overall balance in table 1 of the new revision is the official reserve transactions balance. This was the overall balance recommended by the Review Committee. It was accepted as one of the overall balances by OBE and was included in table 3 ("U.S. Balance of Payments and Reserve Position") when the presentation of the balance of payments was revised in June 1966. The old table 3 has been eliminated in the latest revision, but the data on U.S. reserve assets, liquid liabilities to all foreigners, and nonliquid liabilities to foreign official reserve agencies are now shown in even greater detail in a new

table 8. The official reserve transactions balance, first published only six years ago, is now the oldest overall balance in the new presentation.

The considerations that led the Review Committee to recommend the official reserve transactions balance as the only overall balance can be summarized briefly as follows. First, all transactions in the balance of payments undertaken by the private sector are solely for the purpose of earning profits. This applies as much to capital as to current transactions and as much to short-term movements of funds as to longterm investment. In any case, none of these transactions is designed to finance the balance of payments surplus or deficit. Second, in a system of fixed parities, the monetary authorities alone have the obligation to support exchange rates within the range established by the IMF. They do this by intervening in the market. In the U.S., where the monetary authorities seldom intervene directly in the exchange market, the support of exchange rates comes from the accumulation (or drawing down) of dollar reserves by the monetary authorities of other countries or by the conversion of foreign official holdings of dollars into reserve assets of the U.S. (or the conversion of other reserve assets of foreign countries into dollars). The size of these official reserve transactions measures the intervention that has been necessary to fill the gap in the exchange market and hence measures the disequilibrium in international payments.

The Review Committee also stressed the accuracy of the official reserve transactions balance and its symmetrical character. It avoids the treatment of nonliquid liabilities to foreign monetary authorities as capital inflow, as was done in the old liquidity balance but not in the net liquidity balance. As the errors and omissions are very unlikely to contain any official monetary transactions, the official reserve transactions balance, unlike other overall balances, could be presumed to be complete and accurate. On both these points, the Review Committee underestimated the distorting effect of official transactions in the Eurodollar market, although it discussed the question in its report.[8]

If the only reserve assets that monetary authorities held were the reserve liabilities of other countries, the official reserve transactions balance would be completely symmetrical—total deficits would equal total surpluses. Actually, the increment of gold in world monetary stocks means that the increase in reserve assets will exceed the increase in reserve liabilities, and total surpluses will exceed total deficits by this amount. This is not a serious defect. After all, under the old gold standard, when there were no official reserve liabilities or they were small enough to be treated as capital movements, it was recognized that total surpluses would exceed total deficits by the amount of newly mined gold added to reserves. The official reserve transactions balance was the only overall balance in which the sum of all surpluses and deficits could be shown as equal to the increment of gold in world monetary stocks. For this reason, the annual reports of the Bank for International Settlements (Milton Gilbert, the economic adviser of the BIS, is a former editor of the *Survey*) show international patterns of payments on an official reserve transactions basis. Allocations of SDRs, if not treated as a reserve liability, would now show total surpluses exceeding total deficits by the increment of gold plus the annual allocations of SDRs.

This exception to the complete symmetry of the official reserve transactions balance was not significant and did not affect the accuracy of each country's statement of its own balance. Such is no longer the case because of the sizable interventions of the monetary authorities in the Eurodollar market. If a foreign central bank deposits dollars in the Eurodollar market (still counting them as part of its reserves) and these dollars are lent to private borrowers, the total of all surpluses will exceed the total of all deficits not only by the amount of the increment of

[8] *Ibid.*, pp. 117–18.

gold and the allocations of SDRs, but by this plus the amount of such Eurodollar deposits. If the borrowers of Eurodollars are private foreigners (i.e., do not include U.S. banks and corporations), the destruction of the symmetry does not impair the accuracy of the U.S. official reserve transactions balance. The case is somewhat different when U.S. banks are the borrowers of Eurodollars in response to a very tight monetary policy in the U.S., and the situation is completely different when the U.S. Treasury borrows Eurodollars from the foreign branches of U.S. banks in order to avoid their acquisition by foreign monetary authorities, and thus excludes them from the official reserve transactions balance. These transactions, however, are included in the settlement items in the net liquidity balance.

From 1964 to 1970, the official reserve transactions deficit averaged $1,730 million less than the net liquidity deficit. This was almost entirely due to the increase in liquid liabilities to foreign commercial banks. The difference between the two balances was especially large in 1969, when the official reserve transactions balance was nearly $8.8 billion larger than the net liquidity balance, and in 1970, when the official reserve transactions balance was nearly $5.6 billion less than the net liquidity balance. The large differences in these two years were the result of the enormous borrowing by U.S. banks from their foreign branches in 1969 and the very large repayments of such borrowing in 1970. Of itself, these movements of funds simply show the tremendous effects of differences in national monetary policy. They do not alter the fact that it is the official reserve transactions balance to which monetary authorities are most sensitive. The sharp movements in that balance do, however, raise the question as to the significance to be attached to the overall balance of any one year in evaluating the longrun payments position of a country.

Monetary Transactions Balance

My one regret is that the excellent and comprehensive revision of the balance of payments statistics did not include a balance on official reserve and interbank transactions. The Review Committee did not recommend such a balance because it was about evenly divided on the relative merits of this balance and of the official reserve transactions balance and wanted to avoid a multiplicity of overall balances. The Committee did, however, recommend that short-term claims reported by U.S. banks be shown in the balance of payments under a major heading of their own. Its report stated: "Changes in foreign commercial bank holdings [of dollars] are often intimately connected with changes in foreign central bank holdings. And in certain cases, changes that are intentionally brought about by the actions of monetary authorities, here and abroad, might appropriately be regarded as reserve-type transactions to be entered below the line. . . . The issues here are complicated, and the magnitudes involved are large."

The balance I have in mind would include official reserve transactions, claims of U.S. banks on foreign banks and monetary authorities, and liabilities of U.S. banks to foreign banks (their liabilities to foreign monetary authorities are already included in U.S. reserve liabilities). I would designate this as the "monetary transactions balance." The justification for this designation is that it would cover all transactions between monetary institutions—official and private. This balance, incidentally, would also approximate the effect of the balance of payments on the money supply, as all international payments and receipts affect cash balances except those between banks and governments whose cash

balances are not included in the money supply. The monetary transactions balance would also be more symmetrical than the official reserve transactions balance, as different treatment of Eurodollar borrowings and Eurodollar deposits by this country and other countries would not affect a balance which includes all monetary institutions. Thus the surpluses of some countries would match the deficits of other countries, except for an allowance for additions to the world monetary stock of gold and for allocations of SDRs, if they are included in reserve assets but not in reserve liabilities.

Partial Balances

One purpose of striking a balance in the international transactions of a country is to have a measure of the change in its international payments position in the preceding year or quarter. The fact is that the overall balances are much too volatile to measure a change in a country's payments position over a short period, although they may do so over a period of years. In his foreword to the first balance of payments report, Herbert Hoover said that "a nation still struggling to achieve or to attain a stable currency finds in its balance of payments a chart or compass for its statecraft." [9] The question remains, which balance is the best guide to policy? If not the overall balances, are there others that can serve this purpose?

That is the intended function of the new partial balances in the revised presentation of the balance of payments. Apart from the two overall balances, the new table 1 shows four partial balances: on goods and services; on goods, services, and remittances; on current account; and on current account and longterm capital account. Of these partial balances, the first shows the effect of international transactions on the gross national product, and the third shows their effect on U.S. net foreign investment as defined in the national accounts. The second and fourth, however, have no other function than to facilitate the analysis of the balance of payments—to act as a chart or compass for policy.

Goods, Services, and Remittances

The goods, services, and remittances balance starts with the assumption that an appropriate balance of payments for the U.S. is one in which the surplus on such transactions is adequate, over an average of good years and bad, to finance the foreign grants and credits of the U.S. Government and the normal outflow of U.S. private capital after allowing for the ordinary inflow of foreign capital. That is because in the immediate future—say the next five or ten years— the U.S. will probably still have to finance about as much foreign aid and normal private foreign investment, net, as in recent years. Unless this country develops an adequate surplus on goods, services, and remittances, it will be confronted with a balance of payments problem that will have to be met in one way or another—through changes in foreign exchange rates, control over capital movements, or even control over current transactions of one kind or another.

The Review Committee did not recommend publishing a goods, services, and remittances balance, although the form of its recommended Table I.A was designed to facilitate such an analysis. Remittances and pension payments were placed apart from other unilateral transfers, as is now done in

[9] See n. 2 above.

Table 5.—Balance on Goods, Services, and Remittances, 1964–70

[Millions of dollars]

	1964	1965	1966	1967	1968	1969	1970
Exports of goods and services	37,281	39,407	43,378	46,227	50,623	55,600	62,903
Merchandise, excluding military	25,478	26,438	29,390	30,680	33,588	36,490	41,980
Transfers, military sales contracts	747	830	829	1,240	1,395	1,515	1,480
Investment income	6,399	7,092	7,581	8,311	9,233	10,539	11,409
Receipts from other services	4,657	5,047	5,578	5,996	6,407	7,056	8,034
Imports of goods and services	–28,681	–32,277	–38,078	–41,007	–48,134	–53,589	–59,311
Merchandise, excluding military	–18,647	–21,496	–25,463	–26,821	–32,964	–35,830	–39,870
Direct defense expenditures	–2,880	–2,952	–3,764	–4,378	–4,535	–4,856	–4,851
Investment income	–1,524	–1,798	–2,206	–2,423	–3,013	–4,564	–5,167
Payments for other services	–5,630	–6,031	–6,645	–7,385	–7,622	–8,339	–9,423
Remittances, pensions, etc.	–866	–1,028	–980	–1,278	–1,168	–1,266	–1,410
Balance on goods, services, and remittances	7,734	6,102	4,320	3,942	1,321	745	2,182

table 1 (item 12) of the revised presentation. U.S. Government grants and capital, except military grants, were grouped by the Review Committee under a separate heading. This classification of foreign aid is better suited for an analysis of the balance of payments. The traditional classification, retained in the present revision, separates grants (placed under unilateral transfers) and U.S. Government capital flows. As the June 1971 *Survey* recognizes, "the formal distinction between U.S. Government grants . . . and U.S. Government capital flows . . . does not always reflect a significant economic distinction." [10] In the Review Committee's Table I.A, the private capital accounts were, of course, shown as usual for U.S. capital and foreign capital, except that short-term claims of foreign commercial banks were placed in a category of their own.

The June 1971 *Survey* observes that the goods, services and remittances balance "is somewhat inflated because it includes exports associated with U.S. Government economic grants (and credits) even though the grants (and credits) themselves are not included as debit entries above the line." [11] This does not really impair its usefulness for analytical purposes. The net effect of tying aid to exports of goods and services is probably exaggerated because, directly and indirectly, much of the aid-financed exports are a replacement of exports that would have been made on a commercial basis. In any case, the supposed difficulty is overcome by recognizing that the surplus on goods, services, and remittances must be sufficient to finance U.S. foreign aid with the present tying arrangements and U.S. net private capital outflow.

The greater difficulty is to make a judgment as to how much of a surplus on goods, services, and remittances will be needed to finance foreign aid and net private foreign investment. Such judgments are necessary in evaluating the meaning of any partial balance: there can be no instant analysis provided

[10] P. 27.

[11] *Ibid.*

by a single net figure designated as a balance. What is clear is that the surplus on goods, services, and remittances in recent years has fallen far short of what is necessary for an appropriate balance of payments and that this is the principal cause of the payments problem (see table 5). Moreover, the problem cannot be solved except through a very large, although indefinite, increase in the surplus on goods, services, and remittances. Without attempting a detailed analysis, it is apparent that the cause of the decline in this balance has been the exceptionally large increase in imports and the large increase in direct defense expenditures. The increase in net investment income, the strongest sector of this balance, has more than offset the increase in net payments on other services and remittances.

Current Account and Longterm Capital

The other new analytical balance in table 1 is the current account and longterm capital balance (the basic balance). The merit of this balance is supposed to lie in the fact that it uses the stable segments of international transactions—the current account and longterm capital—while omitting the volatile short-term capital movements and the errors and omissions, which are highly influenced by temporary differences in interest rates in this country and abroad and by expectations of changes in exchange rates. Over an average of years, to allow for short-term cyclical effects, the basic balance is presumed to reflect the longrun trend in the U.S. payments position. It grieves me to have to disagree with many of my friends who are strong supporters of the basic balance. They include Hal Lary, who introduced it in the U.S. balance of payments, Walter Salant, who used it in the Brookings report on the balance of payments, and Paul Volcker, Under Secretary of the Treasury for Monetary Affairs, who cites it in his congressional testimony and public statements. Despite this formidable support for the basic balance, it is open to a number of serious objections that detract from its usefulness as a measure of the underlying payments position of the U.S.

The first objection is that longterm capital movements are not relatively stable. It was because of the instability of such capital flows that many economists, depending on the basic balance as a guide, concluded in the 1930s, 1940s, and even 1950s that there was a permanent dollar scarcity. While the average annual surplus in the basic balance rose from $142 million in 1922–30 to $515 million in the period 1931–39, the average annual surplus on goods, services, and remittances fell from $733 million to $231 million. The reason was that longterm capital movements shifted from a large U.S. capital outflow to a large U.S. capital inflow: the average annual difference between 1922–30 and 1931–39 was $875 million. At the same time, the worldwide recession, the controls on current trade and payments, and the disorderly international monetary conditions brought a sharp decline in the U.S. surplus on goods, services, and remittances, except in 1938 and 1939, when European rearmament began. This analysis led the U.S. delegation at the Bretton Woods conference to conclude that there would be no dollar scarcity (the shortage of real resources for reconstruction apart) because the surplus in the U.S. balance of payments in the 1930s came

Table 6.—Basic Balance of International Payments, 1922–39

[Millions of dollars]

Year	Basic balance	Longterm capital	Current account [1]	Year	Basic balance	Longterm capital	Current account [1]
1922	–173	–815	642	1931	369	194	175
1923	503	–45	548	1932	384	225	159
1924	275	–700	975	1933	185	77	108
1925	139	–570	709	1934	541	200	341
1926	–272	–726	454	1935	280	436	–156
1927	–316	–1,037	721	1936	559	777	–218
1928	180	–847	1,027	1937	490	521	–31
1929	508	–278	786	1938	1,064	97	967
1930	437	–298	735	1939	759	27	732
9-year total	1,281	–5,316	6,597	9-year total	4,631	2,554	2,077
Annual average	142	–591	733	Annual average	515	284	231

[1] Balance on goods, services, and remittances.

Source: Lary, *The United States in the World Economy*, Tables I and II, facing p. 216.

from an exceptional capital inflow that could not be expected to continue.[12]

The second objection to the basic balance is that no valid conclusions can be drawn from it at a time when the Government controls U.S. private longterm capital movements. From 1964 to 1970 the basic balance deteriorated by $3.1 billion. This compares with a deterioration of $5.4 billion in the current account segment of this balance. The difference is accounted for by the decline in U.S. net private longterm foreign investment as a result of U.S. capital controls. U.S. purchases of foreign securities have been held down by the Interest Equalization Tax, and although such investment was larger in 1970 than in 1964, the increase is far less than it would have been without the tax. U.S. direct investments rose in 1965, remained on a plateau from 1965 to 1969, and then rose again in 1970. Transfers of funds from this country for such investment were first put under voluntary and are now under mandatory control. Because of this, U.S. corporations have been compelled to issue a vast amount of new securities in the Eurobond market. Longterm claims and liabilities (net) reported by U.S. banks and nonbanking concerns have also shifted from a large outflow in 1964 (when they were much higher than normal) to a considerable inflow in 1970, partly because of the Federal Reserve guidelines on foreign credits and partly because foreign direct investment controls have compelled U.S. corporations to borrow in the Eurodollar market.

The third objection to the basic balance is that it has other distortions. It includes some special transactions of the U.S. Government, although nonliquid liabilities to for-

[12] E. M. Bernstein, "Scarce Currencies and the International Monetary Fund," *Journal of Political Economy*, March 1945, pp. 1-14. The text of the article states: "Apart from periods of war, there has apparently never been a scarcity of a major currency except during a few years in the 1930's. In the 1930's the dollar did become scarce, for a number of reasons. The largest factor in the scarcity of the dollar was the perverse movement of capital to the United States." Citing the Lary data, a footnote points out that only $900 million of the $7.0 billion inflow of gold from 1934 to 1938 was attributable to the surplus on current account: "In analyzing the change in capital movements during this period to determine its relationship to the scarcity of the dollar, a distinction should be made between the building-up of official balances in this country (which do not, in fact, deplete the monetary reserves of other countries), the flight of private funds to this country, the repatriation of American funds abroad, and the halt in American investments abroad."

Table 7.—Balance of Payments on Current Account and Longterm Capital, 1964–70

[Millions of dollars]

	1964	1965	1966	1967	1968	1969	1970
Current account	5,846	4,295	2,410	2,139	–386	–899	444
Balance on goods, services, and remittances	7,734	6,102	4,320	3,942	1,321	745	2,182
U.S. Government economic grants	–1,888	–1,808	–1,910	–1,802	–1,707	–1,644	–1,739
Longterm capital	–5,818	–6,109	–4,024	–5,335	–963	–1,980	–3,482
U.S. Government credits, net	–1,676	–1,598	–1,534	–2,421	–2,268	–2,193	–1,593
U.S. Government nonliquid liabilities other than to official reserve agencies	328	66	65	–2	107	263	–436
U.S. direct investments	–2,328	–3,468	–3,661	–3,137	–3,209	–3,254	–4,445
Foreign securities	–677	–759	–482	–1,266	–1,226	–1,494	–942
Foreign direct investment	–5	57	86	258	319	832	969
U.S. securities, except Treasury issues	–84	–357	909	1,016	4,389	3,112	2,190
Other, reported by U.S. banks, net	–853	9	525	413	430	477	199
Other, reported by U.S. nonbanking concerns, net	–523	–59	68	–196	495	277	576
Balance on current account and longterm capital	28	–1,814	–1,614	–3,196	–1,349	–2,879	–3,038

eign official reserve agencies are no longer classified as capital inflow. As there is no sharp distinction between short-term and longterm capital, some capital inflows in the basic balance are probably short-term and some capital outflows reported as short-term are intended to be longterm. Moreover, a considerable amount of longterm capital outflow is probably hidden in the errors and omissions. It is difficult to estimate the effect of all these factors (including the capital controls) in understating the true deficit in the basic balance—the understatement probably amounts to $2 billion or more.

Most important, the basic balance assumes that the structure of the balance of payments is not of consequence. In evaluating the payments position of the U.S., it is not reasonable to offset a decline in the current account surplus by a decline in the net longterm capital outflow due to controls unless it is assumed that these controls will not only be continued but will be intensified. A decline in the current account surplus foreshadows a slower growth of U.S. investment income, the strongest item in the balance of payments. A decline in net longterm capital outflow as a result of controls may indicate that capital outflows will increase very sharply once the controls are relaxed or removed.

SOME PHILOSOPHICAL OBSERVATIONS

It is interesting to contemplate the inner meaning of the fact that fifty years after it first published the balance of payments, the Commerce Department has undertaken the most thorough of its numerous revisions of the presentation of the international payments of the U.S. The very first report had as accurate an economic classification of the major items as we have today, and the form

of the balance of payments developed in the 1930s does not differ in essentials from the new standard table. Why, therefore, has it been necessary to have so many revisions, culminating in the most extensive and the most important revision of all in June 1971?

One explanation is that these revisions have tried to reflect the dramatic changes in the structure of the world economy as they have emerged and as we have become aware of them. This is the reason for the succession of new balances in the last 30 years, each designed to show more accurately the transactions in a world economy that is as far different in the 1970s from what it was in the 1930s as one can conceive. It explains why even so fundamental a concept as the reserve position of the United States has had to be steadily refined, first to take account of dollar deposits of foreign monetary authorities, then to include their holdings of U.S. Government securities (short-term and liquid and now also nonliquid), and later to classify transactions with the IMF as changes in monetary reserves (they were long classified as U.S. Government investment).

The second explanation is that the various revisions have been seeking some measure (in a single balance or in a combination of balances) of the underlying payments position of the U.S. The search for new balances has intensified with the shift in the U.S. balance of payments from a large and persistent surplus to a large and persistent deficit. What we are looking for with the multiplicity of balances does not exist. It is some progress that this is recognized in Devlin's article on the latest revised presentation of the U.S. balance of payments. Commenting on the official reserve transactions balance in the *Survey*, he says that although "this balance might be the most important indicator of changes in our external position over the longer run, it is too volatile to be a quarterly [or even annual] indicator of underlying, more basic developments." On the new balances introduced in this revision, he says: "Both the balance on current account and long-term capital [the basic balance] and the net liquidity balance attempt to focus on underlying, longer-term trends in the external position of the United States. Neither is quite successful." [13]

The difficulty in finding a single measure or combination of measures of the payments position is compounded by the fact that regardless of what balance one prefers, an appropriate balance of payments for the U.S. does not mean a zero deficit. Moreover, the appropriate deficit or surplus varies considerably with the balance that is used. Under the old gold standard, the balance of payments had to show a trend surplus to finance the inflow of gold necessary for the normal growth of the monetary base. Under the gold exchange standard, with the dollar as a reserve currency, the U.S. balance on an official transactions basis could in the past show an average deficit of close to a billion dollars (much less now that reserves are supplied by SDRs) without creating a payments problem. The old liquidity balance had an inherent deficit of $500 million to $1 billion per year resulting from the asymmetry between the treatment of U.S. liquid claims and U.S. liquid liabilities. And now, "a deficit on the net liquidity balance does not necessarily imply disequilibrium in the external position, for a net buildup in liquid dollar holdings by

[13] June 1971, pp. 26, 28.

private foreigners (and also by foreign official agencies) may simply reflect the use of the dollar as an international medium of exchange." [14]

The longrun payments position of the U.S. cannot be measured by a single figure designated as the surplus or deficit or even by two balances in combination. What use, then, is there in refining and proliferating overall balances and partial balances? Of course, it is helpful to have the balance on goods, services, and remittances place such great emphasis on this sector of the balance of payments. Perhaps it is useful to combine the current account and longterm capital flows to see whether the sum of the two has been moving up or down. There is something to be learned from an examination of the changes in U.S. liquid claims (including reserve assets) and U.S. liquid liabilities. But these balances of themselves will not tell us much about the U.S. payments problem unless they are used as a starting point for the detailed analysis of each of the major items in the balance of payments. This analysis has been made innumerable times—much of the necessary data are already provided in tables 4 to 10 of the revised presentation of the balance of payments.

Even with the detailed analysis, it is still necessary to make some judgment as to the changes which may be expected in the future in the various sectors of the balance of payments. From a pragmatic standpoint, any structure of the balance of payments is appropriate, provided that receipts are approximately equal to payments, excluding reserve transactions, and that it can be sustained in that form for an extended time. That is the ultimate test of the balance of payments. The present balance of payments is untenable because it is impossible for the U.S. to go on depleting its reserve assets and incurring reserve liabilities on the scale of recent years. Regardless of what any other balance may show in the short run or in the long run, the deterioration in its reserve position is the basic fact with which the U.S. Treasury must contend. Moreover, because the U.S. has neglected its reserve position for so long, the relevant period for restoring its balance of payments has become uncomfortably short. In truth, we know very well what is wrong with the U.S. balance of payments. Fortunately, the U.S. has at last recognized that the basic balance of payments problem is the overvaluation of the dollar. Now that the dollar is being depreciated, we may reasonably hope that the large and persistent payments deficits will finally come to an end.

[14] *Ibid.*, p. 28.

DANIEL H. BRILL

A Business Executive Looks at the Survey

3

I am very happy to extend my congratulations—and my thanks—to the editors of the *Survey of Current Business* on its fiftieth anniversary. For over three decades, as a student, a Government official, and, more recently, a business executive, I have found the *Survey* a principal source of economic intelligence. It is in my business activities that I have found the *Survey* to be of greatest value. Without an extensive staff to compile and interpret current economic measures, and under the pressure of having to make business decisions consistent with fundamental economic trends, I have found the *Survey* indispensable.

I am sure that each user of the *Survey* would tend to focus on some different aspects of its coverage. For me, the most important contribution comes from the review articles that analyze in depth recent trends in major sectors of activity—capital spending, consumption, government spending, the balance of payments, etc. This is not to slight the value of the "blue pages," which enable me to keep up to date those statistical series which are most important in business decision-making. But I do find most helpful the articles which analyze emerging trends in key areas and the tabulations accompanying them, which combine and rearrange the statistics in order to bring out the most important causal relationships. In this age of a surfeit of economic newsletters and public prophesizing, the reasoned analyses found in the pages of the *Survey* are most welcome. I look forward to depending on the magazine for many years.

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ANDREW F. BRIMMER

4

Exports and Foreign Production by Multinational Corporations

The Office of Business Economics undoubtedly will receive a large number of congratulations on the outstanding contributions made during the first fifty years of publication of the *Survey of Current Business*. It occurred to me that—instead of simply sending another expression of best wishes—I might best convey a sense of my own deep regard for the contributions of OBE's staff by citing just one example of my own use of the work being done. At the same time, I would like to underscore the importance of providing the Office with the support needed to make further progress in developing the basic data and analysis on which economic research and policymaking depend.

IMPACT OF U.S. FOREIGN INVESTMENTS

One of my interests for several years has been the problem of the balance of payments of the U.S., and specifically the direct and indirect impact of U.S. private foreign investments. Currently, it is taken for granted that multinational corporations are a major influence on the balance of payments and that we need to know as much as we can about the operations of such firms. For almost three years (1963–66) I was closely associated with OBE, first as Deputy Assistant Secretary and subsequently as Assistant Secretary for Economic Affairs in the Department of Commerce. During this period, in 1965, when I was partly responsible for the first effort to exercise a governmental influence over the direct investments of American companies (at that time a voluntary program) I relied heavily on the OBE staff to compile and analyze the available information on these investments. I found a considerable fund of information developed as part of a forward-looking research program—not only the data needed for entries in the balance of payments accounts but also data on the cash flow and overall productive activity of these foreign affiliates of U.S. firms.

U.S. EXPORTS AND SALES OF AFFILIATES 1957–64

One of our analytical objectives then—as now—was to examine the relationship between the manufacturing production of the foreign affiliates of U.S. firms and the export of comparable products from U.S. plants. In November 1965 I was able to draw on data developed by OBE from a complete census covering 1957, plus annual surveys thereafter, to show that production abroad was growing much faster than exports for a broad range of products. From 1957 to 1964 exports of selected manufactured products for which there was counterpart production abroad had increased by 45 percent—from $7.2 billion to $10.4 billion. Over the same period, sales from foreign plants increased 117 percent—from $11.6 billion to about $25 billion. Clearly, the volume and rate of growth of production abroad were factors to be reckoned with in any analysis of the future of U.S. foreign trade, although I want to emphasize that these data alone are not sufficient to establish the net overall trade effect of such operations.

Of course, to keep up with this fast-moving sector we need up-to-date information. Fortunately, OBE has tried to meet this need. Last October an article was published in the *Survey* that brought the data for sales of foreign affiliates up to 1968. These data were still benchmarked on the complete 1957 census, updated on the basis of annual surveys of a sample of large companies. We have tried to obtain U.S. export sales of a comparable

Table 1.—U.S. Exports and Sales of Selected Manufactures by Foreign Affiliates of U.S. Manufacturing Corporations, 1962 and 1968

[Millions of dollars]

	All areas, total		Canada		Latin America [1]		Europe		Other areas	
Commodity	1962	1968	1962	1968	1962	1968	1962	1968	1962	1968
Selected manufactures:										
Affiliate sales	18,442	40,353	5,026	11,506	2,476	4,730	8,910	18,718	2,030	5,399
U.S. exports	9,245	16,012	1,976	4,949	1,935	2,666	2,792	4,248	2,542	4,149
Chemicals:										
Affiliate sales	4,400	10,215	1,295	2,123	880	1,987	1,760	4,362	465	1,743
U.S. exports	1,876	3,287	288	462	404	624	655	1,182	529	1,019
Rubber products:										
Affiliate sales	1,332	2,126	340	580	302	415	460	665	230	466
U.S. exports	146	188	31	78	31	25	35	35	49	50
Machinery, excl. elec.:										
Affiliate sales	3,359	8,192	810	1,685	144	402	2,090	4,903	315	1,202
U.S. exports	4,062	6,529	857	1,675	768	1,132	1,260	1,857	1,177	1,865
Electrical machinery:										
Affiliate sales	2,671	5,298	851	1,457	360	591	1,320	2,881	140	369
U.S. exports	1,361	2,284	317	544	241	373	484	744	319	623
Transportation equip.:										
Affiliate sales	6,680	14,522	1,730	5,661	790	1,335	3,280	5,907	880	1,619
U.S. exports [2]	1,800	3,724	483	2,190	491	512	358	430	468	592

[1] Affiliate sales data include, but export data exclude, "other Western Hemisphere."

[2] Excludes civilian aircraft.

NOTE.—The data on exports and foreign affiliate sales are not completely consistent with one another on the definition of the various commodity groups.

Source: U.S. Department of Commerce, *Overseas Business Reports*, OBR 70-21, May 1970, and OBR 68-70, August 1968; *Survey of Current Business*, October 1970.

group of manufactures for 1962 and 1968. The aim was to derive a rough impression of how this situation developed during the sixties.

1962–68

From 1962 to 1968, sales by foreign affiliates again were growing much faster than U.S. exports (see table 1).[1] While U.S. exports of selected manufactured goods increased from $9.2 billion to $16.0 billion, or by 73 percent, sales abroad of the same types of goods by foreign affiliates rose from $18.4 billion to $40.4 billion, or by 119 percent—a figure two and one-half times U.S. exports.

Moreover, from 1962 to 1968 foreign affiliate sales increased faster than U.S. exports for every major category of manufactured goods. As a result, by 1968 foreign

[1] The export series used here differs somewhat from that used in 1965 in comparing 1957 and 1964 results, especially because of changes in some of the definitions of the commodity groups in the census trade data. The base year 1962 was chosen since it was the earliest year for which export data in the required detail were available on a basis consistent with that of 1968.

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affiliate sales exceeded U.S. exports for each major commodity group. The heaviest dependence on foreign affiliate sales relative to exports in 1968 was in rubber products,[2] followed by transportation equipment and chemicals.

By geographical area the ratio of affiliate sales to U.S. exports was highest for Western Europe—4.4 in 1968 compared to 3.2 in 1962. The next highest ratio was for Canada, although that ratio declined slightly —from 2.5 to 2.3—from 1962 to 1968. However, for Canada both affiliate sales and U.S. exports were affected substantially by the 1965 U.S.-Canada Automotive Agreement. As a result of this agreement, a large proportion of U.S. automotive exports to Canada are engines and parts to be used in Canadian production of vehicles which are then shipped to the U.S. This circular flow of vehicles and parts has resulted in sharply increased affiliate sales (most of the increase from 1962 to 1968 was in the form of exports to the U.S.) and an equally sharp increase in U.S. exports to Canada.

According to the data published in the October 1970 *Survey*,[3] about 8 percent of the sales of foreign manufacturing affiliates in 1968 were exports to the U.S., up from about 4 percent in 1965. However, most of the increase in the proportion exported to the U.S. was accounted for by the special situation for Canadian-produced transportation equipment.

DATA GAPS

While these data are helpful, many gaps remain to be filled. For one thing, the 1968 data are already somewhat out of date, and we do not yet have the new benchmark that will be established when the complete OBE census covering 1966 can be fully tabulated. It is indeed regrettable that this very important information, covering most of the significant aspects of U.S. multinational corporate activities, can only emerge slowly because OBE's resources cannot be stretched further to speed up the processing. Moreover, to be fully effective for analytic purposes, these data must be integrated with a comprehensive body of information on domestic and international corporate activity. I understand that OBE has plans to develop an integrated data system that would be the backbone of such analysis, and I would certainly support vigorously its efforts to progress in that direction. The results would be extremely helpful for policy-oriented research as well as for use by business economists and economic analysts in general.

[2] This may be partly because of differences in the definition of rubber products between the foreign affiliate sales data and the export data.

[3] P. 20.

ARTHUR F. BURNS

National Goals and Economic Statistics

5

It gives me great pleasure to congratulate the Office of Business Economics on the fiftieth anniversary of the *Survey of Current Business*. Over the years the *Survey* has been a highly important source of basic economic data and analysis. The quality of its statistical and analytic work has made it an indispensable publication for everyone seriously interested in economic developments and prospects in the U.S.

The impressive status of the *Survey* reflects, of course, the tireless devotion of the OBE staff to the systematic improvement of economic data and analysis. The widespread use of the national income accounts as an integrated system for measuring and evaluating economic developments is an achievement of the first magnitude. Businessmen as well as government officials have become increasingly dependent on the national accounts for planning purposes. For economists, the national income data facilitate the testing of economic hypotheses and the development of experimental models of aggregate economic behavior. Other OBE statistical programs—among them, the balance of payments accounts, input-output analyses, regional economic data, and statistics on private capital formation—have also proved to be of great benefit for economic analysis and for policy purposes.

IMPROVING THE DOMESTIC ACCOUNTS

The forthright approach of the staff in evaluating the nature, purpose, and limitations of the data has done much to earn the OBE worldwide respect. Of course, much work still remains to be done. I look forward to further improvement of our present array of national economic accounts in such areas as the development of comprehensive national and sectoral balance sheets, improved measures of output and productivity for the service trades, and the development of measures of output and productivity for government at all levels. Reconciliations of the accounts with other important related economic data would help to provide a better understanding of the apparent conflicts that occasionally emerge.

In recent years, attention has been increasingly focused on a wide range of socioeconomic assets and costs, such as capital assets of government, the tangible value of education and of human skills, the extent of environmental damage, and changes in the quality of life. How such assets and costs should be reflected in the national economic accounts is a relevant issue to which much thought and research will need to be devoted.

INTERNATIONAL ACCOUNTING

Of course, everybody concerned with the U.S. balance of payments knows that the *Survey* publishes authoritative data on this subject. We would hope that sufficient resources can be found to develop such additional information as bilateral accounts with major countries, and to exploit more fully the basic information collected on the international operations of U.S. business.

Our basic economic and social goals will be more difficult to achieve unless all of us work for the development and improvement of statistical measures of our performance. Thus, it is extremely urgent that statistical agencies, including the Office of Business Economics, continue to receive the funding needed to carry out the programs essential to meeting our growing requirements for better data in the years ahead.

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ANNE P. CARTER and WASSILY W. LEONTIEF

6

Goals for the Input-Output Data System in the Seventies

In 1959 the Office of Business Economics announced its intention of expanding the system of national accounts to include input-output tables published at regular intervals. Since then it has published two benchmark tables: an 85-order table for 1958 and a 478-order table with aggregated versions at 367 and 85 order for 1963. Additional detail for food, nonferrous metals, utilities, and construction sectors was published after the 1958 table was released, and an updated version was estimated for 1961. The 1963 study expanded the basic classification scheme almost sixfold. This disaggregation goes a long way toward meeting the demands of the business community for detailed information for market analysis and for the simulations used by modern management.

While OBE prepared the first input-output tables integrated with the national accounts, the 1958 table was not the first constructed for the U.S. A 450-sector table was constructed for the year 1947 by the Bureau of Labor Statistics. That table is also by far the best documented of any input-output table, large or small. The 1947 Bureau of Labor Statistics study laid a vital foundation for the later OBE program. It established the major statistical methodologies and accounting conventions and provided experience for the key personnel who direct the present work.

INTEGRATION WITH INCOME ACCOUNTS

There is great advantage in having the input-output tables consistent with the system of national accounts and published on a regular basis. An essential element of continuity over the years is thus guaranteed. When the input-output and other income accounts are combined in an integrated system, consistency constraints ensure greater accuracy throughout the system. In addition, it becomes easier to combine input-output with other economic statistics for meaningful analysis. Now, as contrasted with five or ten years ago, a significant proportion of users of input-output statistics comes from outside of the community of input-output specialists. This is an important development. Input-output tables are a rich source of information on industrial production requirements and on markets. Such information can be valuable to individual sector analysts, students of industrial organization, and market analysts, to name a few. The higher the standards of consistency of input-output and other statistical series, the greater the utility of all the elements of the system.

SUPPLEMENTARY INFORMATION

Users are indebted to OBE for contributing informal guidance in interpreting the published statistics and for assembling supplementary information—price indices tax and margin estimates, and unofficially updated and projected transactions. These services undoubtedly drain significant resources from official projects, but they greatly enhance the usefulness of the published materials. In time, it may be wise to transfer some of this unofficial work to the formal account system.

Despite the excellence of the present information system, pressures are mounting for further extensions and improvements. As users work more and more intensively with the material that is now supplied, they become aware of its limitations. At the same time, their horizons broaden. Inevitably standards are higher than they were seven years ago, and they continue to rise.

What, then, do we hope for in future input-output data?

TIMELIER DATA

First, the length of time required to prepare this material must be cut down. This time factor is particularly important to business and government agencies that use input-output information as a basis for planning or projecting into the future. Tables for 1958 and 1963 were not published until six years

later. Past experience assures us that input-output structures do exhibit heartening stability: many coefficients change gradually over time. Still, there is consensus here and in other countries (where technological change is presumably slower) that even a five-year-old table tends to be stale. It cannot be used with confidence for forward-looking decisions without some form of statistical correction or updating. Potential users in the business community seem to be the most seriously concerned about timeliness.

Any outsider tends to underestimate the length of time required to do this job. We must understand that the construction of input-output accounts requires many time-consuming stages of compilation, estimation, correction, balancing, and reconciliation before publication. It is also clear that the rate of compilation of information by the Census limits the rate at which the input-output tabulations can proceed. Certainly, much more rapid preparation of tables would be technically feasible if sufficient resources were devoted to the task. As the Nation reconsiders its priorities, such improvements of the statistical system as this must be seriously considered, both for their scientific value and for their potential contribution to wiser decisions in areas of national policy.

BETTER DOCUMENTATION

Thus far, documentation of the tables has been all too brief and general. This is in accordance with a longstanding tradition for published Government statistics: the user must acquire professional training in the statistical methodologies used in order to understand the meaning of the published figures. Fortunately, there are books and courses in practical statistics and national income accounting that help to enlighten the users of traditional statistical series. Input-output accounts, however, are relatively new and complex. Many users focus on a relatively small class of entries—transactions among a limited group of competitor or customer sectors. Often they try to relate the input-output information to information from other sources. More frequently than not they need to know in detail how the input-output accounts were estimated before they can put them to intelligent use. The excellent documentation of the 1947 input-output study of the Bureau of Labor Statistics still provides answers to many questions about the 1958 and 1963 tables, but these answers become obsolete as the changing structure of the economy requires changes in the statistical framework itself and as new methods are developed at OBE. Furthermore, the 1947 documentation was never published and is not widely available. Users solve their problems by writing or telephoning OBE, by guesswork, or by abandoning their projects altogether.

OBE has been generous in replying to individual questions and in sharing its worksheets with anyone willing to purchase a microfilm copy, but this is not a satisfactory solution to the problem. It inevitably absorbs time and money without building a general documentation accessible to the broad population of students and research workers. More

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might use the numbers and use them better if they understood them better.

GREATER INDUSTRIAL DETAIL

Despite an extensive and growing literature on the principles of industrial classification, its actual design remains an art. Most of us who have worked with the 85-order input-output classification can single out two or three sectors whose scope seems less than felicitous, but the overall design is unquestionably sound. While many wish for still more detail than is found in the 1963 table, or for a different balance of detail between manufacturing and nonmanufacturing sectors, the 1963 table approaches the four-digit Standard Industrial Classification "sound barrier." A table with much greater disaggregation would require revamping the censuses that furnish the basic information for the tables. The Census information system must some day be expanded to meet growing needs.

Right now, the demand for more and more extensive published detail on the part of business users (or would-be business users) seems almost insatiable. In any event, those who use input-output as a basis for corporate planning must continue to supplement available statistical materials from the Government with data from their own information and accounting systems.

SECONDARY PRODUCTS

Fictitious Transfers

As the input-output tables get larger and the pressure for detailed data is maintained, it may be wise to reconsider some of the basic accounting conventions. In particular, the treatment of secondary products in terms of fictitious transfers is more troublesome for large than for smaller matrices. The proportion of products classed as "secondary" tends to increase with the number of sectors. At 85 order the proportion of total production originating outside the primary sector of origin in 1963 was 5.7 percent. For the same year, but at 367 order, the proportion of secondary production was 7.1 percent and would be even higher at the 478 order. The range of secondary production among individual sectors is very wide. For some sectors, transfers-in exceed 50 percent of total output.

Product vs. Industry

Several research groups that work regularly with the input-output tables have converted to a "pure product" (or "product-to-product") basis. Using the information in OBE's input-output tables on industries' input structures and the industrial origin of products, they solve algebraically for input structures that characterize each *product* (as opposed to *industry*) group. The procedure requires the questionable assumption that the input structure for any given product is the same regardless of the industry where it is produced, and some ad hoc procedures must be introduced to guard against negative or patently absurd positive entries in the estimated product-to-product matrix. It might be very convenient for some users to have a product-to-product version of the input-output table published by OBE. However, there is much to be said for staying with the present format. The estimates that are now published are relatively easy to interpret and verify. The published accounts provide the data necessary for the user to convert to the pure product basis if he wishes to do so.

SNA Proposals

The United Nations System of National Accounts suggests another powerful alternative to the present square table format with fictitious secondary transfers. This system is applied in Canada, where "rectangular" input-output tables are compiled on a regular basis. Rectangular tables give significantly more product than industry detail, i.e., the classification scheme for inputs is more detailed than the classification scheme for outputs. Before a rectangular input-output table can be used in standard input-output computations, it is

necessary either to aggregate the product detail to form a conventional square table or to specify a complementary "repartition matrix" that tells the proportions of each product to be supplied by each sector. Under the former alternative (the squared matrix) we face the secondary product problem just as we do in our present system. The second alternative is more flexible: for a given problem we can assume that the present industrial distribution of production will be maintained, or that it will be altered in any specified way. The price of this added flexibility is more cumbersome computations. The format suggested by the SNA has two very important advantages: (1) it admits as much detail as is available in the basic Census sources; and (2) the meaning of each entry is straightforward because observed transactions are not combined with fictitious transfers.

With present computer technology, 367-order computations tend to be cumbersome, even with square matrices. While many individual users refer to the 367-order tables for information on particular transactions or groups of transactions, full-scale 367-order computations are probably restricted to a few specialized research organizations. For these research organizations, as well as for the reference users, there might be considerable advantage in the more flexible SNA format. At any rate, it seems a goal worth exploring in planning the compilation of future tables.

FURTHER DATA NEEDS

Any budget-conscious husband knows that the purchase of a new dress will trigger purchases of shoes, hose, and other accessories to realize or enhance the value of the initial outlay. (There is, of course, no assurance that the accessories will cost less than the dress.) Analogously, the publication of input-output accounts makes possible (or almost possible) types of analysis that were formerly out of the question; therefore requests are generated for auxiliary information to realize and enhance the analytical potential of the input-output table.

Primary Factor Inputs

No economist needs to be reminded of the pivotal importance of primary factor inputs in the analysis of almost any problem of production or prices. In fact, most economists have tended to concentrate attention on direct labor and capital inputs, ignoring intermediate requirements in a first approximation. Input-output accounts should make it possible, at long last, to deal systematically with intermediate requirements as well, but it is still very difficult to obtain reliable information on direct labor and capital requirements that is compatible with the input-output accounts. Right now, inadequate detail in the value-added sectors is a serious bottleneck. At a minimum we need separate rows in the input-output table for wages, taxes, capital charges, and profits. Labor coefficients compatible with the input-output classification are estimated for particular years by the Interagency Growth Project, capital coefficients by the Office of Emergency Preparedness. Neither of these series is published on a regular basis, nor will any agency vouch for their compatibility with the official national accounts. Ironically, these informal estimates often play the dominant role in the overall input-output computations.

Regional I-O Accounts

In other circles, there are demands for regional disaggregation of the input-output accounts. Students of transportation and pollution problems stress the importance of tying their special information to input-output statistics.

New Units of Measurement

It would, however, be inadvisable to approach the planning of the further develop-

ment of input-output information as if it were simply an elaboration of conventional national accounts. This would deprive the input-output system of its increasingly important role as a bridge between the dollar-value balance sheets of the national accounts and a much wider universe of economic, demographic, and technological structures and relationships that must be described in purely physical terms (tons, yards, decibels, hours, or even "number of units").

Thus, for example, the labor input row of an input-output table can—and should as soon as possible—contain not only dollar figures of wages paid but also man-hours or man-years, broken down by skills. Similarly, the rows showing the distribution of the output of the construction industry (or rather of several different construction industries) should describe that distribution not only in dollar figures but also in square or cubic feet of space. The introduction of "commodity-to-industry" and "industry-by-commodity" tables, as described earlier in this discussion, would, for obvious reasons, facilitate the presentation of physical along with dollar-value flows.

Similar considerations of the approach described above would permit systematic incorporation into the national as well as regional input-output tables of externalities (such as various pollutants and their elimination), both by columns and by rows.

FRAME FOR STATISTICAL PROGRAMS

However great the advantages of centralization in the preparation of national accounts, it is clear that division of labor among statistical agencies will be necessary in order to continue and to augment the complex statistical system that is developing. A great deal of effort will be required to integrate the classifications and other statistical conventions of the various agencies so as to take full advantage of any of the information that is assembled. Such effort, however costly, is essential if the promise of the new in-output accounts is to be realized.

The argument presented for nonaccounting data has even more general implications for the development of statistical programs. In principle, at least, the individual accounts of private enterprises, public organizations, and, to a lesser extent, private households constitute the elemental building blocks from which the present system of interrelated national accounts is put together. To obtain the supplemental structural information of a nonaccounting type, both private and governmental statisticians must resort more and more to sampling and survey procedures. The input-output system provides a convenient device for organization, verification, and analytical utilization of this type of data. It might provide answers to the many questions that inevitably arise when nonmarket or even noneconomic factors have to be taken into account in assessing the status of our developing society.

EDWIN L. DALE, JR.

Solving the Insoluble

7

It is doubtful that the great men who founded the Office of Business Economics envisioned the day when newspapermen and women would snatch eagerly at the press release on the preliminary estimate of the gross national product as it comes, hot off the press, from the Commerce Department printing office. But they do. In short, although the Bureau of Labor Statistics continues to boast a bust measurement (the unemployment rate) and a waist measurement (the consumer price index), both rather unattractively swollen lately, OBE has sex appeal too.

OBE'S PAYMENTS PROBLEM

This raises the question of whether OBE can cope with one particular type of sex appeal—the attraction of that ungainly teenager called the balance of payments. Any answer from this quarter must begin with recognition of a fundamental fact: OBE does not exist for newspapermen, nor, indeed, for any "general public" if reasonably defined. It exists mainly—and I think ought to exist—for specialists, in and out of Government. There is no reason why general newspapers should deal with the mass of detail that OBE, in its indispensable way, publishes on everything from State personal income through the automotive industry's share of GNP to the U.S. international asset position, though we reporters can use these figures as we wish. By all means let OBE remain predominantly as shy as it is chaste, with an occasional bright Easter bonnet in the form of publication of the GNP or corporate profits figures.

The gray area is the balance of payments. Through nobody's fault—certainly not that of the U.S. Government, the international monetary system, or OBE—the subject has acquired a certain prominence. Sexy I shall not call it. But alas, it has worked its way into the consciousness of decent, law-abiding bankers and Congressmen and businessmen, who have been forced to add it to their eternally expanding list of public "problems." And thus we ink-stained wretches are supposed to keep them up to date on the matter.

At the moment, as everyone knows, we cannot. Some of us pretend. Some of us throw up our hands in despair. All of us have to write *something.* To be more serious, it is, of course, not a newspaperman's problem. No one on this earth knows for certain what to make of the U.S. balance of payments, though some people think that they know. I am well aware that the U.S. Government is grappling with the statistical problem, and that OBE is in the thick of the fray. Let me take this occasion to make some suggestions that might help those of us who are the immediate middlemen between OBE and the public—suggestions which (and this is much more important) might have some wider usefulness.

NO OVERALL BALANCE

The first, and crucial, suggestion, is to *publish no overall balance of payments figure at all:* no "liquidity balance"; no "official settlements" balance; no "balance on current and longterm capital accounts." An underlying reason for this suggestion is a slightly un-American view of mine, which applies to much more than balance of payments statistics. It is simply stated: if a problem is insoluble, accept it as insoluble and stop trying to solve it. (As an aside, I have a hunch that economists try to solve far too many insoluble problems—or, put another way, to

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make too many unpredictable predictions or draw too many unconcludable conclusions.)

A meaningful presentation of the total U.S. balance of payments, certainly for the general public and quite probably even for central bankers, is in my view just such an insoluble problem. Why not treat it as such? The Supreme Court has not yet held it unconstitutional for the Federal Government not to publish certain statistics. When, if this proposed decision were made, some newspaper people and politicians and bankers and foreigners gravely charged that the Government was somehow trying to fool everyone and abdicate its responsibilities, the answer would be to sit tight and let the storm blow over. There is a remarkably high probability that no one would be impeached and that the sun would continue to rise each morning.

MONETARY AND TRANSACTION NUMBERS

What, then, should be published? The answer lies in combining absolute honesty and constructive Machiavellianism—which is not, as some might think, a contradiction in terms. It is a neat trick but not an impossible one. The Government would continue to publish absolutely everything that is now published by way of individual numbers except, as we shall note, "errors and omissions"—that is, all that is now published on which the Government has some information. This would include monetary numbers (foreign dollar holdings, Special Drawing Rights, etc.) as well as transactions numbers (trade, military expenditures, net security purchases, tourism, direct investment, and all the rest). This can and should be done even if, as our always chaste OBE will admit, some of the transactions numbers are perhaps a little more reliable than others (as a tourist I often wonder how much I am fooling OBE).

However, there would be a change. The Federal Reserve and the Treasury would publish monetary numbers and OBE would publish transactions numbers, some of which, of course, are collected by the Treasury and the Federal Reserve. Never would a monetary figure (reserves or liabilities) emerge from OBE's door. As all analysts and most newspapermen know, this would automatically eliminate both an overall balance of payments figure and errors and omissions (the latter being the only means of reconciling monetary numbers with transactions numbers). This system would not prevent anyone from deriving any balance of payments figure he wanted, but he would have to derive it himself. The Government would have said, by implication, that it knows a good deal about our international transactions but that it does not presume to know what our balance of payments is. The lack of knowledge is not new: it is the implicit admission which would be new, and it would be constructive. It would not for five seconds relieve us of balance of payments "discipline."

Before mentioning a secondary point, let me note two not inconsiderable "footnote" advantages of this proposal. It would eliminate those absurd and painful explanations of Government window-dressing transactions on the monetary side, whether or not such transactions themselves continued, for perhaps good and sufficient reasons of their own. It would also take the sting out of an "in-joke"

that is being increasingly heard about the economics profession itself: that the economists' task is that of seasonally adjusting errors and omissions.

As noted, the foregoing is the heart of the proposal. The next suggestion is for a system of classifying what we do know—that is, on the transactions side. It depends upon there being no overall balance of payments figure, which gives some leeway for working toward greater simplicity.

REGULAR TRANSACTIONS

Let us consider breaking down known transactions into two, and only two, broad categories. The first I prefer to think of as "regular transactions," though I have no objection to the term "current account." It would include trade, tourism, other services (shipping and the like), military expenditures, net governmental foreign aid, other governmental expenditures abroad, remittances, income from investments, and perhaps one or two other categories. These items can change from year to year, of course, and the changes are important, but they almost always have the same positive or negative sign. They have had, and do have, trends, even though occasionally they are erratic. However, dock strikes and Canadian Expos can be mentioned and explained in terms that are understandable, just as the impact of a big retroactive Government pay raise on a month's personal income figure can be explained.

"HAPHAZARD" TRANSACTIONS

The second category I would call "identified private capital transactions." It would include net security purchases by both Americans and foreigners, net bank lending to foreigners, and the dollar outflow portion of direct investment. There would be a clear notation, quarter after quarter until the end of time, that there are other capital transactions which have taken place, usually quite legally, which have not been identified. The OBE release each quarter would, of course, appear a little more than a month later than it does now. It would come out only when reasonably good figures for known transactions were available, about when the *Survey of Current Business* now publishes its balance of payments article, some 80-odd days after the end of the quarter.

The release, and the article, could quite appropriately strike a balance on regular, or current, transactions and a balance on identifiable private capital, or haphazard, transactions. It would explain changes in the elements of each, or at least describe them. For example, in this context there would be no difficulty—in a category that is by definition "haphazard" anyway—in describing why and how foreign borrowing or quarterly compliance with U.S. regulations sharply changed the direct investment outflow figures in a given quarter. The concerned citizen—and the Congressman—would come to know that the numbers in this capital category are interesting but not decisive, certainly not in the short run. The experts would have the data that they have now. And this includes, to be fair, those experts who believe in controls over bank lending and capital outflow; they would have just as much "balance of payments" ammunition as before.

No one would be deceived. Foreign central bankers would know how many dollars they were taking in no matter how we presented our statistics. But a bit of avoidable foolishness would disappear from our lives. That is a consummation devoutly to be wished, even if economic policy is not improved by a jot and the "balance of payments" problem does not thereby, as it would not, go away.

EDWARD F. DENISON

8

U.S. National Income and Product Estimates: Evaluation and Some Specific Suggestions for Improvement

For fifty years—can it really be so long?—the *Survey of Current Business* and its supplements have been the chief outlet for the research of the Office of Business Economics and its predecessor, the Economic Research Division of the Bureau of Foreign and Domestic Commerce. Magazine and agency have been inseparably intertwined. Reporting and analysis of the current business situation could improve only with the development of an analytical framework, an adequate flow of up-to-date information, a historical record for comparison, a base of past analyses, and a corps of competent analysts. As progress was made in all these respects, the monthly "survey of current business" became more penetrating. So did analyses of longer-term economic changes and trends, which the magazine, despite its title, happily has not neglected. The *Survey* has also reported whatever research engaged the agency at a given time, which was proper even though articles on the incomes of private-duty nurses and lengthy reports on the details of foreign aid must sometimes have surprised business readers.

If the magazine has benefited from the agency's research, the converse is also true. Use of the agency's data in analysis for the *Survey* has pointed up information gaps and inconvenient definitions of series. (If memory serves, OBE's present Director thought it odd to write in each quarter of 1943 that the value of production, as measured by GNP, had increased because of a rise in the Federal debt; this experience had something to do with the later decision to eliminate government interest from GNP.) Without the inexorable GPO deadlines for the *Survey*, research would rarely have been completed on schedule, and without the magazine as outlet, staff of the caliber required for research could scarcely have been assembled and retained.

I trust the fourteen years that have elapsed since I left the OBE staff are adequate to eliminate suspicion of bias when I express, as I must, my enormous admiration for OBE as an organization and for the skill and devotion of its staff. OBE ranks among the top economic research agencies in the world. How this came to be would make an interesting study, but surely fine leadership, devoted to objectivity, was indispensable. Great credit must go to its three directors: Amos Taylor, the late M. Joseph Meehan, and now George Jaszi. For almost three decades OBE has relied upon Jaszi's many talents, not least his logical and disciplined way of approaching all questions and his rare ability to distinguish between innovation and nonsense.

INCOME AND PRODUCT ESTIMATES

I shall confine my comments to the topic that has interested me longest, the national income and product estimates. The Department of Commerce began national income estimation in 1933 under Simon Kuznets, and work proceeded under Robert Martin and Robert Nathan. I well recall the situation in July 1941, when my own fifteen years of service began. Data released on a regular basis already included annual estimates of national income, cross-classified by type of income and by industry, with consistent data for employment; monthly estimates of national personal income (then called "income payments to individuals") by type of income, unadjusted and seasonally adjusted; and annual estimates of personal income by States, by type of income. Milton Gilbert, Daniel Creamer, William Shaw, Dwight Yntema, and others in the National Income Unit had already started the direct estimation of expenditures for GNP and thorough revision of the income estimates. Full advantage was to be taken of exciting new sources of data, in-

cluding those emerging from the unemployment compensation and old-age and survivors' insurance programs, from the great improvement in Census information introduced in the 1939 establishment censuses and the 1940 Census of Population, and from the first comprehensive tabulations of noncorporate business data from tax returns.

World War II so depleted the staff that the new estimates were not finished until 1947, but the work had progressed far enough by 1942 to permit publication of current annual and quarterly estimates of GNP classified by both its income and product components. Consequently, the key analytical series that emerge from relationships between these two sets of estimates, when they are supplemented by appropriate data for government receipts and expenditures, were also obtained: the balance of saving and investment and the disposition of personal income. The "national income and product accounts" came into existence. Introduction of the basic direct and revised estimates (in 1947) and of GNP in constant prices (annually in 1951 and quarterly in 1958) completed the framework for a set of income and product data that are suitable for both short-term and longterm analysis.

DESIGN OF THE U.S. NATIONAL ACCOUNTS

From the World War II period to the present time, most increases in the usefulness of national income data have resulted from the addition of interesting and analytically valuable breakdowns of the major aggregates (GNP, national income, personal income, and disposable personal income), their major components, and certain other broad aggregates (especially government receipts and expenditures) that enter the national accounts.

This additional detail has involved new types of classification, greater frequency of reporting, or increased geographical detail. Examples are national income cross-classified by legal form of organization and type of income; GNP in constant prices by industry; personal income by county groups and by metropolitan areas; estimates of personal income by States on a quarterly basis; and government expenditures cross-classified by type of function, level of government, and kind of expenditure. This method of expanding the data base has proved flexible and efficient. It allows valuable research time to be concentrated on series that are both useful and amenable to estimation. When desirable, particular series can even be provided that are not part of a comprehensive classification; gross auto GNP was introduced without the simultaneous addition of "vacuum-cleaner" GNP or similar components and proved invaluable in the interpretation of economic developments during the recent General Motors strike. This general line of development is consistent with the preservation of a simple, readily understandable structure of the "national income and product accounts"; here I intend the precise sense of the term used in table A of the annual national income presentation.

The U.N. and OBE National Accounts

I take time here to commend expansion of the information base by this route only

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because it was not inevitable. There was and is an alternative: expansion of the structure of the "national income and product accounts" by proliferating the number of sectors, the types of transactions, and the types of accounts (beyond "current" and "saving and investment"); then "articulating" the accounts (i.e., showing each type of transaction between each account for each sector and for every other account). This is, in fact, the road to which the future development of national income statistics will be diverted if the new United Nations system of standardized national accounts is taken seriously.

The main objection to this approach is that it is inefficient: for every series of any real interest that is developed, at least a dozen series of trivial or no value must be estimated to fill out the "accounts." Because most of the series called for are of no appreciable interest, existing systems of data collection do not provide the information required by the new SNA; either collection of trivial data would be required or the numbers would have to be imaginary. The new SNA has another weakness; it is so complicated that not even serious and expert users of national income and product data (and few producers, for that matter) can be expected to understand it or the meaning of the numbers it is to contain. Since a main use of "accounts" is as an expository device, this is no small disadvantage. A very simple set of accounts like OBE's, supplemented by supporting tables to provide analytically interesting detail and alternative breakdowns, is a far better approach, in my opinion.

There are, to be sure, no absolute principles or criteria that can be easily set forth to delimit the proper scope for "accounts" in national income statistics. Of course, I am not opposed to organizing useful information in accounting form when this can be done conveniently and with little waste.

Saving and Investment

For example, in the past OBE has presented SEC estimates of personal saving classified by changes in assets and liabilities of different types, of international flows of assets in the balance of payments, and of the sources and uses of corporate funds. Each type of information has been considered of interest in its own right. If some changes could be made in these series and estimates for government could be prepared, the whole could be presented as unarticulated "saving and investment accounts" for the corporate, personal, government, and "rest of the world" sectors. Such a study was once begun in OBE but never published, for reasons not known to me —perhaps it was the impossibility of obtaining sufficiently consistent and accurate data or of reconciling with the Federal Reserve Board "flow of funds" data.

Capital Stocks and Wealth

Three of the most valuable expansions in OBE data during the past decade can also be used to illustrate my viewpoint: the capital stock study, new regional data, and input-output tables. The capital stock study (including the new series for dwellings) provides a number of variants of the values of the private gross and net stock of structures and equipment and of current and cumulated depreciation upon them, all measured in current and constant prices as well as in "book" values. These data are very useful, quite apart from any connection they may have with national "accounts." Together with the inventory estimates that underlie the inventory change component of GNP, they provide information needed to measure capital input, rates of return, and, as I shall remark shortly, national income and product. It happens that they also provide all the data except land values that are required to measure the business component of the privately

owned national wealth, and that this is a sizable portion of the information that would be needed to construct sector balance sheets. OBE was right to develop the capital stock series separately, and first, because they are very important series. If it could eventually develop national and sectoral balance sheets (or "wealth" accounts) organized around a simple accounting structure (and if the information is useful), this would not exemplify the proliferation of accounts that I find objectionable; rather, it would provide data—asset and liability values—of a type altogether different from that in the present national income accounts.

Regional Estimates

The Regional Economics Division of OBE has made advances in the information and analysis it can provide for States, smaller areas, and combinations of areas that I would scarcely have believed possible when I left OBE in 1956. The new estimates have remained closely tied to the concept of personal income, with detail by type of income and, where relevant, by industry. They have been supplemented by estimates of disposable income and information on closely related series. I understand that geographical breakdowns of national aggregates of personal consumption expenditures and employment are in the process of development. The personal income data have proved to be highly flexible instruments for regional analysis, serving many purposes well. In my judgment, the emphasis and approach have been just right. The Division has not let itself be diverted very much by requests to develop regional "accounts" paralleling the national accounts. Given the way the U.S. economy functions and the assumptions that would be required to produce less-than-national accounts, I am very dubious that regional accounts could add much, if anything, to what can now be done with the personal income series.

Input-Output Tables

Provision of input-output tables on a continuing basis has been a third major expansion of data. Whether or not it is a set of "accounts," an input-output table does provide a complete articulation of product flows from every industry to every other. The usual disadvantage of articulation, especially when there are more than a handful of sectors, is present—much effort is required to produce low-quality estimates of a myriad of unimportant series—but the whole effort rests on a considered judgment that the value of having a complete table exceeds, by more than the additional cost of its preparation, that of a set of tables which would contain only items of significant interest. We do not have an example here of a desire for the expression of sophistication or elegance in the formulation of "accounts" that would impair the exercise of good sense in the determination of where the greatest payoffs will be in the expansion of national income and product and related series.

In short, I think that OBE has channeled its resources wisely in the past. I am confident that it will do so in the future even if this requires the return of a good many blank pages when the U.N. sends out future national accounts questionnaires.

IMPROVING INCOME AND PRODUCT DATA

It is difficult to respond to a request for suggestions as to how OBE can improve its contribution to knowledge about the American economy because I cannot hope to offer anything new. But in the national income

and product area there are a few items, none involving really major new research, that may be worth a reminder.

Depreciation; Services of Dwellings

Present Procedures

First, OBE now provides three measures of the value of the Nation's output in current prices—GNP, NNP, and national income (which can also be regarded as net national product at factor cost)—and one measure, GNP, in constant prices.

NNP and national income in current prices, as now published, are needlessly defective measures. The defect is that they are obtained by use of a capital consumption series which is a mixed bag of components. For nonfarm business, it consists of historical cost values and reflects whatever service lives and depreciation patterns are allowed at a particular time by tax laws and regulations and by accountants. For nonfarm, noncorporate dwellings, the series is constructed more or less analogously but avoids temporal inconsistencies resulting from tax law changes. For farm property, depreciation is valued at current prices by a procedure that is consistent over time. The measure of total capital consumption allowances is consistent neither among components nor over time. The only possible use for the nonfarm components is for tax analysis; they have no relevance to the measurement of output or income. All the inconsistencies and inadequacies carry over to OBE's measures of net corporate saving and personal saving.

In the absence of acceptable OBE series for NNP and NI in current prices and of any OBE series at all for NNP and NI in constant prices, the analyst has only two choices. Either he makes up his own series—a course which OBE's capital stock study fortunately makes possible, on an annual basis—or he uses GNP when net product or national income would be appropriate. The second course, regrettably, is the one more often chosen.

In my view, regular publication of both net national product and national income in current prices based on depreciation measured consistently in current prices rather than mostly at historical cost, and of both national income and net national product in constant prices, is overdue. The capital stock study provides almost all of the necessary data. Throughout the tables the presentation could parallel that now accorded the inventory valuation adjustment. In the current dollar estimates depreciation in current prices, and income and product based upon it, would simply replace the present estimates based on historical cost, except that a breakdown between "book" profits and "depreciation valuation adjustment" would be retained for corporations and nonfarm proprietorships and partnerships.

Selection of Depreciation Method

I see only two possible problems in implementing this suggestion. First, the OBE study of capital stock provides alternative sets of depreciation estimates in current and constant prices, based on various combinations of assumptions with respect to depreciation formulas, length of service lives, and price indexes. Firm evidence as to which series is the "best" is lacking. I suspect that OBE has hesitated to use any one series in the national income and product estimates for fear that this might be interpreted as an indication that it gives priority to that series. The situation warrants caution to the user but not failure to make a choice. Use of *any* series OBE might select to approximate economic depreciation valued in appropriate

prices will greatly improve the existing current price income and product series, and it will fill a major gap in the constant price data. I do not see how any user of the data can be worse off after the change, or can even suppose he is worse off, than he is now. Moreover, if he prefers to do so, he can still substitute alternative series from the capital stock study to the full extent that this is now possible. I do not see the necessity of making a selection as a sufficient objection.

Industry Allocation

The second problem concerns the distribution of national income by industry. It arises because the capital stock study does not provide estimates in industry detail. Even if the depreciation valuation adjustment had to be introduced in the *Survey*'s table I.12 as a reconciliation between the sum of industries and the national income total, the procedure should be adopted. But the situation is not this bad.[1]

The OBE industry classification for national income and GNP distinguishes 64 industries. One more, a "services of dwellings" industry, is badly needed for analysis of productivity and income shares. My second recommendation, quite apart from the depreciation question, is that it be established in line with European practice. It would contain income or product originating in the provision of dwellings services; this industry is now divided between "farms" (a minor portion) and "real estate" and cannot be isolated from published data. Its separation would make a total of 65 industries classified.

In six of these 65 industries (the four in government, the rest of the world, and private households), depreciation is not measured, so these industries will raise no problem if depreciation is revalued. In one, farms, the present estimates prepared by the Department of Agriculture are satisfactory. (If a different formula is desired, they can also easily be replaced.) The depreciation figures now used for dwellings are OBE's own estimates at historical cost. They could simply be replaced by current price series and used for the "services of dwellings" industry that I have just proposed. The situation is the same for depreciation in the "nonprofit membership organizations" industry and for the bulk of depreciation (also on nonprofit property) in two more industries, "medical and other health services" and "educational services." (Nonprofit depreciation in any case does not affect national income, only GNP.) The remaining depreciation in the two last-named industries is so small that even a bad estimate of depreciation revaluation could be introduced without noticeably impairing income originating. The industries enumerated accounted in 1969 for 22 percent of national income and about 32 percent of depreciation (based on OBE's current coverage of depreciation but revalued at current prices).

The remaining industries are those in which depreciation is now wholly or in significant part derived from tax returns. The capital stock study would allow the depreciation revaluation adjustment to be estimated fairly well for manufacturing as a whole. If rather high standards of accuracy were to be imposed in allocating the depreciation valuation adjustment among industries, it would at worst be necessary to combine the estimates for the 21 manufacturing industries, which in 1969 accounted for about 29 percent of national income and 19 percent of capital

[1] In the following paragraphs, references to the accuracy of the industry allocation refer to the breakdown of a given national income total, as distinguished from possible errors in the total itself.

consumption, and to combine 33 other industries, which accounted for 49 percent of national income and also 49 percent of depreciation in current prices. (A few of the latter industries could actually be separated because depreciation is so small that any conceivable error is trivial relative to national income.) If OBE were to adopt this course, it would not be objectionable.

It would be better, however, to be a bit more daring and make the full allocation by industry. This would require more new research than the steps proposed thus far, and high accuracy would not be obtained in the estimates. But accuracy of the adjustment must be judged relative to the series to be adjusted, and the allocation of national income to most industries, though useful, is only a fairly crude approximation, for reasons noted in the following paragraph. Moreover, the series for income originating in any industry is likely to approach more closely an estimate corresponding to an appropriate definition of income if estimates are made in accordance with that definition than if they are made with some other.

The weaknesses in the existing industry series are well known, and I pause for only a brief comment upon them. Three I merely note because I have no suggestions for improvement. They are the classification of corporate profits and interest on the basis of corporate returns rather than of establishments, erratic changes in the classification of profits and interest when the degree of consolidation of returns changes, and difficulties in estimating the inventory valuation adjustment by industry.[2]

Revisions in the SIC

A fourth difficulty is more objectionable because it is unnecessary. The Standard Industrial Classification is periodically revised, and, as a consequence, reports of agencies collecting primary data provide only a collection of broken series, at best with overlaps. By much effort and ingenuity OBE has made adjustments to preserve industrial comparability and now covers the entire period since 1929 with only two classifications, overlapping at 1947. But many of the adjustments are only approximations. They should not be required. I believe it fair to state that the only basis for many of the changes that have been made in industrial classification is that successive groups of people considering the same facts will reach different conclusions, and if the classification is regularly reviewed it will be regularly changed. To one group, optometrists belong in medical service because of the nature of their work; to another, in retail trade because they sell glasses. Other classification changes had their origin in requests from industry groups seeking some legal advantage from being classified in a different industry. Certain changes in the standard classification are, to be sure, justified by real changes in the structure of the economy, but few of these affect comparability in as broad a classification as OBE's—two digits or less. The whole process of revising the Standard Classification for agency reports implies a contempt for the value of time series analysis. My third recommendation, then—addressed not to OBE but to the Office of Management and Budget—is that in the future such changes be entertained only for the most compelling reasons.

Total Factor Input

A fourth suggestion has a personal aspect. The Bureau of Labor Statistics and OBE have been providing financial support and statistical cooperation to the Brookings Institution for my current growth study, which includes the preparation of an annual

[2] I do not mention that the industry classification can at best be a classification of establishments. Although for some purposes an activity or product classification would be more appropriate, it is quite unattainable.

series for total factor input that is as consistent, statistically, with OBE's output measure as I can make it. I hope that when it is completed the two Government agencies jointly will take over the series, keep it up to date, and seek to improve upon it. I believe it will prove of value as a continuing series, currently available on an annual basis.

Estimating Methodology

A fifth suggestion is more in the way of encouragement than advice, since I know that it is something that OBE wishes to do. An up-to-date description of the methodology employed in the preparation of the income and product series is needed. If preparation of a bulletin describing all estimates at once is no longer feasible, consideration could be given to the occasional release of descriptions of segments of the estimates.

Costing Environmental Programs

A final suggestion, which I know is also under consideration, concerns provision for a statistical record of the expenditures or costs that will be incurred under new programs to protect and improve the environment. Broadly, this has two aspects. First, the classification of government expenditures, and perhaps of consumer expenditures as well, will need review. Second, estimates of the costs imposed upon business will be needed. It is likely that OBE will be called upon to participate, probably heavily, in their provision.

Quality of Data

My last comments mainly concern the quality of data. OBE's first responsibility is to provide the most accurate information it can. Its high reputation in the national income field rests heavily and deservedly on the diligence, persistence, ingenuity, common sense, and "feel" for data exhibited by its staff. This sort of research requires a combination of talents and interests that is rare and to be treasured. Users feel, usually rightly, that however good or bad the basic information may be, OBE analysts will be thoroughly familiar with the sources and will use them to produce the best estimates possible. Inevitably, there are areas about which one nevertheless wonders whether enough is being done, and I cite two examples.

Direct Labor Purchases

No less than 14 percent of gross national expenditure and 17 percent of national income (viewed here as expenditure for net national product at factor cost) consists of the direct purchase of labor by general government, households, and institutions. This sum ought to be deflated by price indices that are based upon specification pricing, like those used for deflation of most commodities and most other services. Because they are measurable determinants of the prices paid for a year's labor of different kinds, the specifications should refer to hours worked, education of the worker, sex, age or experience, and possibly other characteristics. At present, deflation is based—separately for a limited number of industries, or types of activity—on average annual compensation of employees, which amounts to use of unit cost indices where the unit is a year of employment. I think it would be possible, at least for the civilian components, to move reasonably close to specification pricing, and I suggest that this should be attempted. A likely by-

product of this effort would be improvement of the current dollar estimates.

Consumer Interest

Interest paid by consumers — estimated at $17 billion in 1970, following an extraordinary rise—is another series which may deserve more attention, or at least more explanation, by OBE. Here I refer to classification as well as measurement. The decision was made in 1966 to eliminate payments of interest by consumers from personal consumption expenditures, national product, and national income and, instead, to treat them like government interest. The rise in total output would have been greater under the old treatment. The net interest share of the national income would have been very different: $50.5 billion in 1970 instead of the $33.5 billion now reported. The analogy with government interest that justified the reclassification seems to me valid for only part of consumer interest, the amount corresponding to the interest that would be paid on loans equal in total magnitude to consumer debt but extended in wholesale amounts and with little risk of default or costs of collection: interest rates paid by firms extending credit to consumers might provide an appropriate measure of this figure. Much of consumer interest is reimbursement for the high costs of extending, servicing, and collecting loans in small amounts. It is not clear to me why this ingredient should be omitted from personal consumption expenditures. The operating expenses of life insurance companies seem to provide a better analogy than government interest.

Credit extended by sellers seems to raise special difficulties of maintaining temporal comparability. It is not clear why personal consumption expenditures should include the total price paid for commodities purchased on credit when no explicit service charge is made but exclude service charges when they are made explicit. Unless there is some rationale that eludes me, the rapid extension of service charges must have biased downward the movement of the consumer expenditure estimates in current prices. (It may have similarly biased downward the movement of price indices, leaving the constant price expenditures unbiased.) On the strictly statistical level, I am puzzled as to the method of estimating service charges imposed by retailers, electric utilities, and other firms selling to individuals, and also as to whether or not errors in these estimates tend to be offset in the consumption estimates. A special *Survey* article on the treatment and measurement of consumer interest, which might also provide the occasion for a careful review of the data, would be very welcome.

Though I have concentrated on OBE's national income and product estimates, I cannot close without a tribute to the staff of the *Survey* itself, especially to those responsible for the "S" pages, for their vigilance in catching revisions, their impeccable attention to the footnoting of noncomparabilities, and the indispensable descriptions of series that have been provided for many years in the Business Statistics supplements to the magazine.

EDGAR S. DUNN, JR.

The National Economic Accounts: A Case Study of the Evolution Toward Integrated Statistical Information Systems [1]

9

This paper intends to view the development of the national economic accounts as one phase in an evolutionary process that exhibits a movement toward integrated statistical information systems. The forty-year history of the information programs of the Office of Business Economics and its predecessor organizations forms a valuable case study of this process. It records the innovative information services that have made a superb contribution to public and private management. It also reveals the anomalies that accompany the application of all innovative processes. An examination of this experience may enable us to anticipate some of the problems and prospects we face in future statistical development.

It is helpful to trace the stages of development leading to the national economic accounts in their present form. There are three phases of particular interest. In the first, statistical systems were largely concerned with the development of economic indicators. The second witnessed the emergence of an integrated statistical information system in the form of the national income and product accounts. The third applied this emergent economic accounting concept to the statistical representation of other segments of the economic domain. Following a discussion of these three stages, I will suggest that we are currently well into a transition phase that is leading us beyond the framework of the traditional economic accounts. I will articulate what I take to be the meaning of this experience.

EARLY ECONOMIC ESTIMATES

Prior to the emergence of the economic accounts concept, data systems generated simple indicators or measures that were primarily intended to measure changes in the stocks and flows of those economic or social attributes of interest for management processes. Thus, governments sought indicators of changes in fiscal capacity upon which to base tax rates and assessments. Businesses sought indicators of external changes in sales volume to indicate needed adjustments in production and marketing activities. School districts sought indicators of population upon which to base school enrollment plans.

These measures have served and continue to serve the understanding and management of large numbers of both public and private activities. Every social entity that manages any aspect of human activity makes use of such indicators to signal internal and external behavioral changes which require a management adjustment. Extensive histories could be

[1] I wish to acknowledge the intellectual support and helpful criticism supplied by George Jaszi and David Rosenblatt. They do not, however, share any responsibility for the views herein expressed or for their form of expression.

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written about the development of such measures and the roles they play.[2]

The evolution of these indicators and the statistical system that generated them proceeded from the simple to the complex, and the measures were extended in scope of coverage and in frequency and timeliness of reporting. Measures of single attributes were progressively aggregated into more inclusive or general measures. They were combined not just through aggregation but through the use of index number techniques, and they were extensively analyzed through techniques of time series analysis. Actual measurement was supplemented by sampling techniques and other methods of estimation that broadened the scope and reduced the cost of generating certain types of information. All of these developments took place primarily in response to the need for indicators to serve management functions.

This has been the longest phase in the development of statistical information systems. The procedures developed and their information products continue to play a major role in the social process and absorb the bulk of our statistical resources. They have also been a necessary antecedent to, and form essential components of, more integrated statistical information systems. Their importance remains undiminished and is not being questioned.

EMERGENCE OF INTEGRATED STATISTICAL SYSTEMS IN THE FORM OF NIP ACCOUNTS

During an era when management functions of government had to do primarily with such things as adjusting tax rates and assessments and budgeting expenditures for and managing traditional public services, management rules and simple indicators, partial in scope, were sufficient. Growing experience with problems that are systemwide in scope or impact revealed that statistical systems organized to generate economic indicators were not adequate to satisfy the new demands. Governments were faced with the need for information systems of a kind previously restricted largely to private management.

Businesses, for example, have long been served by two kinds of information systems. The first generates simple indicators (e.g., rates of production and volume of sales) that originate both inside and outside the enterprise and serve as simple signals in monitoring and adjusting the performance of subsystems. The second generates more integrated sets of information, traditionally in the form of accounts. These are designed to give empirical content to an image of the functional relationships that *define the total system itself* (or some important set of total system relationships). They provide an information base for total system guidance and management.

Governments have traditionally had limited total system guidance functions and responsibilities, and, in our form of government, it is not likely that they will form the

[2] Those measures which served as antecedents of the economic accounts have been described in a historical narrative by Carson (Carol Stine Carson, "The History of the United States National Income and Product Accounts: The Development of an Analytical Tool," Ph. D. diss., George Washington University, 1971). Early estimates of national income can be traced to individual investigators as early as the mid-1800s. From there the development can be traced through the activities of the National Bureau of Economic Research and the National Industrial Conference Board in the 1920s, the Federal Trade Commission, and, finally, the Department of Commerce in the 1930s. Carson describes this development as a response to the new demands for public management information created by two world wars, the Depression, and the increasing sophistication of business management. She identifies as significant such requirements as indicators of fiscal capacity to guide public taxation, war planning, market analysis, the analysis of current economic conditions, allocation guides for Federal grants-in-aid, and the management of public works and social security programs.

kind of management system characteristic of businesses and formal organizations. But we have come to accept a responsibility for Government in overall economic guidance, in emergency planning, and in taking account of the impact of large-scale programs. Concomitantly, the need has arisen for something more than simple economic indicators. The period of the thirties and forties, therefore, witnessed the emergence of the national income and product accounts—the beginning of a social accounting analog to business accounting. With this development we crossed a major threshold in the technique of generating and using information—the integrated statistical information system.

Consider, first, what is meant by an integrated statistical system. Stone suggests that there are four characteristics: (a) a common unit of measurement (in the NIA, dollar value), (b) a set of consistency criteria (in the NIA, total income equals total product), (c) a structure of components which supports the analysis of interrelationships (e.g., consumption as a function of income), and (d) a capability of using the system, sometimes in conjunction with other information, to project its own level and structure (macroeconomic forecasting models).[3]

In general, I accept this as a valid characterization. However, implicit in these characteristics is another I consider to be central to the concept of the integrated statistical system. It is of major importance that the information system be designed to correspond in a useful way with a set of social relationships conceived as a social system or a behavioral entity. This is important because the concept of "real world" behavioral entities matched with empirical representations (however incomplete) in the form of integrated statistical information systems is, in my view, essential to an understanding of the evolution of information systems and of what the study undertaken here indicates about the problems and prospects we face.

Before proceeding, it should be emphasized that we are employing modern systems concepts. When we speak of an entity we presuppose the coherence of a number of parts (constituent activities) of an organized analytical unit. It is characterized by a set of relationships that is more than an assemblage; it is a pattern of relationships which are thought to exhibit a degree of self-regulation or to be capable of being made coherent through regulation. As such, these entities (either the image of "real world" relationships or the constructed statistical representation) are the consequence of conceptual abstraction.[4] The patterned relationships they

[3] United Nations, Economic and Social Council, Statistical Commission, *An Integrated System of Demographic Manpower and Social Statistics and Its Links with the System of National Economic Accounts*, prepared by Richard Stone (E/CN.3/390), May 28, 1970.

[4] As Beer points out: "We select, from an infinite number of relationships, . . . a set which, because of coherence and pattern and purpose, permits an interpretation of what might otherwise be a meaningless cavalcade of arbitrary events. It follows that the detection of a system in the world outside ourselves is a [mental construct. It is not] possible to prove that a system exists, or is thus and thus; it is possible to say only that the treatment of a certain collection of [activities] as a system is helpful" (Stafford Beer, *Decision and Control* [New York: John Wiley, 1966], p. 243; bracketed material added). This is a fact of major significance. If we examine the implications that flow from this aspect of modern epistemology, we recognize that the construction of statistical entities to represent these system concepts is an essential aspect of the larger iterative, ongoing process of designing, testing, and transforming behavioral social systems and developing social problem solutions. It is an essential aspect of the process of social learning (see my *Economic and Social Development: A Process of Social Learning* [Baltimore: Johns Hopkins Press, 1971]).

depict are never fully independent or autonomous; hence they may contain related subentities that may themselves be systemic in character or may become related in supra-system entities. Entity concepts and representations are, therefore, often hierarchical in character and may also overlap (i.e., embrace common activity spaces).[5]

This entity characteristic of integrated statistical information systems enables us to identify the transition from the first to the second evolutionary phases outlined above. Economic indicators are really nothing more than single-attribute measures or assemblages of measures. The development of the national income and product accounts represented the emergence (at the level of Federal statistical programs) of the integrated statistical information system in the sense indicated here.

In one sense, of course, the national accounts are an assemblage of economic indicators and the GNP is a rough, gross scalar of total economic activity; it is often used as a simple indicator. But there is much more to it. These components are assembled in such a way as to permit a representation of some of the key total system relationships characteristic of a coherent, patterned behavioral system known as the U.S. economy. The pattern representation emerges not out of simple aggregation of component indicators but out of defining and arranging them in such a way as to give empirical substance to the classical image of a circular flow economy with balance characteristics. It supports the analysis of stability and growth. This entity character of the national accounts overshadows in importance the indicator properties of GNP.

THE EMERGENCE OF SOCIAL ACCOUNTING VIEWED AS A PARADIGM SHIFT

I believe that this movement from the production of statistical indicators to the design and production of integrated statistical entities constitutes a "paradigm shift," in the sense set forth by Thomas Kuhn in *The Structure of Scientific Revolutions*. Kuhn characterizes the bulk of scientific research in all fields as "normal science." This is orderly, cumulative work that takes place under the control of a paradigm—a conceptual framework or unifying theory that has emerged out of earlier scientific practice. For example, the general equilibrium theory of the market economy supplies such a framework for much of the ongoing work in the field of economics.

As Kuhn points out, one of the striking things about normal science is that it does not aim at producing novelties and that when it is successful in its own terms it finds none. It seeks the progressive testing and refinement of the paradigm until its correspondence with nature is perfected. Yet this very process serves to generate novelty. "New and unsuspected phenomena . . . are repeatedly uncovered by scientific research, and radical new theories have again and again been invented by scientists . . . . Discovery commences with the awareness of anomaly, i.e., with recognition that nature . . . has violated the . . . expectations that govern normal science . . . . It closes only when the paradigm theory has been adjusted so that the anomalous becomes expected, and until the new adjustment is completed—until the scientist has learned to see nature in a different way—the new fact is not quite a scientific fact at all." [6]

In short, a paradigm shift emerges. Scientists have to turn their attention to the

[5] In an earlier and more general discussion of integrated information systems ("On Some Aspects of Models of Complex Behavioral Systems," in *Information and Decision Processes*, ed. Robert E. Machol [New York: McGraw-Hill, 1960]), David Rosenblatt recognizes the importance of the entity concept.

[6] Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1964), pp. 52–53.

formulation of new concepts to guide their work. It is important to realize that this is not just a simple extension of established theory. It involves a fundamental change in perspective and perception. The old theory may or may not remain valid. If it does, the domain of its validity is now recognized to be more restricted, and its interpretation is modified by the perspective of the new paradigm. To illustrate: the general equilibrium theory of the market economy could not accommodate the anomalous experience of unemployment and inflation and led to the invention of the macroequilibrium theory of the "new economics." I would like to suggest that, in the narrative just completed, the emergence of integrated statistical information systems under the control of the social accounting paradigm amounts to an analogous displacement. The shift of emphasis from the measurement of scale and changes in scale to the construction of integrated statistical entities is a change in kind as well as in degree.

As an aspect of this shift we have experienced an order of magnitude change in the information content yielded by the set of economic indicators which are shaped into a representation of the market economy of the U.S. by the national income and product accounts. This representation of the coherent behavior of a systemic entity has yielded new understandings and new possibilities for social system guidance. It has made it operationally feasible to place some limits on economic instability, contributed immeasurably to analysis of business conditions, and facilitated national resource management during wartime emergencies.

DEVELOPMENT OF ECONOMIC ACCOUNTS AND THE EMERGENCE OF ANOMALY

As Kuhn describes it, a shift in concepts such as this one is normally followed by a period of cumulative work in which the concepts are reapplied, refined, and extended. We can witness this process at work in the history of the development of the national economic accounts. We can see it as taking place in roughly two phases—a period of reapplication of the social account concept to the construction of separate statistical entities, followed by a period of reconsolidation.

Breeding a Variety of Entities

As indicated, the income and product accounts represent the economic system of the U.S. as a coherent behavioral entity. However, they are restricted in scope to a systemic representation of only the goods and services throughput of the market sector of the national economy. This representation has been enormously useful for the kinds of economic management mentioned above, but there are other policy and management issues for which a statistical entity so conceived does not yield an appropriate set of integrated statistics.

For example, the income and product accounts depict the value of the transactions of real goods but not the counterflow of financial transactions. The financier or the central bank money manager has tended to look to a different set of data differently organized. In the early fifties the development of the flow of funds account [7] was a response to this need. The resulting statements provide information on the extension of bank credit, the purchase of securities, and other changes in financial assets and liabilities of the different sectors of the economy, as well as on the payment and receipt of income.

Again, the national income and product accounts net out intermediate transactions in the interest of generating the aggregate flows of product and income. The pattern of relationships defined by their structure has limited relevance for describing or planning

[7] See Board of Governors of the Federal Reserve System, *Flow of Funds in the U.S., 1939–1953* (Washington, D.C.: U.S. Government Printing Office, 1955); Morris Copeland, *A Study of Money Flows in the U.S.* (New York: National Bureau of Economic Research, 1952).

internal reallocations of resource flows. World War II and its immediate aftermath witnessed an emergent demand for a different kind of capability at a time when Leontief's work had provided the conceptual basis for depicting a different entity defining interindustry transactions in the economy (where these interindustry transactions were more directly focused upon the structure of production, in a technological sense). At the same time business management began to visualize uses of such a statistical construct in business planning. The result was a set of tables for 1947 constructed by the Bureau of Labor Statistics with the support of other Government agencies, most notably the Air Force. They represent a complete production sector breakdown of all commodity and service flows between defined industries within the Nation and of the way in which these flows relate to certain sectors of final demand.

Another example is the case of the balance of payments accounts. The Depression and the conditional success of wartime-spawned fiscal and monetary policies (made possible, in part, by the income and product accounts) generated a demand for a more comprehensive set of balance of payments accounts. The active pursuit of these policies led to the separation of domestic and international liquidity considerations [8] and generated new problems for the management of international transactions. There emerged a demand for a more detailed information system to reflect the behavior of this system of international transactions. The summary balance of payment account in the national income and product accounts was inadequate for this purpose, as were the historically older statistical series.

There are three important aspects of this history. First, it demonstrates that the social accounting paradigm is a generic concept capable of application to the statistical representation of more than one image of systemic relationships. Second, although each of these economic accounts represents some aspects of the behavior of the total economic system, each is centered upon different aspects. Each abstracts from the total system a particular pattern of relationships designed to serve a particular purpose. (For example, behind balance of payments accounting lies the system image of the money market; behind input-output accounting lies the system image of an aggregate production function.) Each fulfills the characteristics of an integrated statistical system. Third, the entity characteristic of the integrated statistical information system forms an inherent limitation. The statistical system is always constructed to represent a specific behavioral entity, and its utility can only with difficulty be extended to issues more directly related to different patterns of behavior. While the integrating power of the entity concept yields an amplified information content, that amplification does not extend naturally beyond the behavioral domain being represented. This yields a class of problems in the production and use of statistical information that I shall characterize as the "entity problem."

Trend to Second-Order Integration

This breeding of a variety of integrated statistical entities has led, in turn, to a trend toward second-order integration.

Integration of the Economic Accounts

As we have seen, each of the accounting entities identified above can be viewed as representing a behavioral subsystem (or component entity) of the more inclusive national

[8] See National Bureau of Economic Research, *Input-Output Analysis: An Appraisal,* Studies in Income and Wealth 18 (Princeton, N.J.: Princeton University Press, 1955); U.S., Bureau of the Budget, Review Committee for Balance of Payments Statistics, *The Balance of Payment Statistics of the U.S.: A Review and Appraisal* (Washington, D.C.: U.S. Government Printing Office, 1965).

economic system. It not infrequently happens, as a consequence, that some problems of economic analysis require that information components from two or more of these distinct sets of accounts be related. For example, in balance of trade problems it is sometimes important to consider exports or imports of products in relation to the total domestic output of the product. This requires the ability to relate balance of payments items to appropriate sectoral accounts in the input-output accounts or the income and product accounts. Again, one might wish to examine the implications of a projection of final demand based upon the income and product accounts for structural changes represented by the interindustry accounts.

Solution of these and other analytical problems requiring the use of the separate account structures in conjunction with one another encounters difficulties because those structures were not originally designed with a view to jointly describing a higher order behavioral entity. Although, as defined, the behavioral systems they represent are interrelated, little attention was given during the early stages to defining these relationships and making the corresponding sectors of the accounts congruent.

It is quite natural that in the evolutionary process such obvious anomalies would generate the demand for second-order integration—the integration of these accounts. Proposals for integration and studies of the problems involved appeared in the mid-fifties and early sixties in the conferences and publications of the National Bureau of Economic Research.[9] In the years since then an important degree of integration has been achieved. A brief consideration of the problems of integration is instructive.[10]

The kind of integration that has been achieved takes its form from the accounting logic which views input-output as a deconsolidation of the income and product account (acct. 1), the balance of payments as a deconsolidation of the foreign account (acct. 4), and the flow of funds as a deconsolidation of the savings-investment account (acct. 5). Accordingly, integration is achieved at the level of the summary totals of the income

[9] E.g., *Input-Output Analysis: An Appraisal; The National Economic Accounts of the U.S.*, General Series 64 (Princeton, N.J.: Princeton University Press, 1957); *The Flow-of-Funds Approach to Social Accounting*, Studies in Income and Wealth 26 (Princeton, N.J.: Princeton University Press, 1962).

[10] It is important to rule out two unproductive ways of thinking about second-order integration. First, there is no value in contemplating a full cross-classification of all the detailed accounting sectors in these four sets of accounts. There is no advantage, for example, in recording for each of the several hundred industries in the input-output matrix the associated forms of institutional organization in the flow of funds and the portions of their financial flows attributable to each activity. Quite apart from formidable practical obstacles, such cross-tabulations would not often correspond to a behavioral relationship believed to be characteristic of functional and causal links in the real world economic system. They would not represent a meaningful economic entity and would, accordingly, have little descriptive or analytical utility.

At the other extreme, something more is contemplated than providing simple reconciliation tables between the aggregates. An example is an early table published with the flow of funds accounts which describes the adjustments necessary to move beyond the concept of consumer nonfinancial sources of funds in the flow of funds accounts and the personal income concept in the national income account (see Board of Governors of the Federal Reserve System, *Flow of Funds in the U.S., 1939–1953*, p. 20).

and product accounts and the summary totals of the auxiliary accounts.[11]

This kind of integration has resolved one form of the entity problem by merging these separate accounting entities into a more comprehensive economic entity that permits some of the important interrelationships between the subentities to be traced. For example, a pattern of final demand projected through the use of the income and product account structure can be tested for reasonableness, structural logic, and internal consistency through the use of the integrated input-output account. Indeed, they may be conceived and applied as a single composite entity.

Although this achieved integration was motivated by the spur of certain entity problems and has partially resolved them within the context of a higher order statistical entity, a number of important entity problems remain. Let me emphasize that I am not criticizing the economic statisticians who generated these accounts—their achievements have been formidable. It is important to realize that the entity problem is inherent in the construction of conceptual and statistical entities and cannot be totally resolved by reintegration into higher order entities, which will, in turn, exhibit similar limitations.

Consider some of the ways in which the entity problem remains to plague us. First, it is common for an entity concept which attempts to formulate systemic relationships between a set of economic variables to appear in several closely related or alternative forms. There may be several ways in which the variables may be meaningfully related to give a representation to relationships. In order to construct a statistical representation, one of the conceptual patterns has to be settled upon. The very process of constructing a statistical entity introduces a certain amount of arbitrariness and rigidity. Saying yes to one system representation amounts to saying no to the remaining options. This applies to both levels of detail and the general structure of the accounts.

For example, under the present structure the income and product accounts consist principally of newly produced final product grouped into four sectors of the economy: business, personal, government, the rest of the world. (Intersector capital transactions are also shown consolidated in a savings and investment account.) One meaningful option that cannot be accommodated by this statistical entity might be a three-account classification designed to correspond to the three fundamental economic functions of producing, consuming, and adding to wealth. Another illustration is supplied by the controversy over the adequacy of the current definition of the payments deficit in the balance of payments account.[12]

Again, simply changing the level of detail or aggregation can change in important ways the relationship one is able to depict. Whenever numbers are added, potential for representing systemic structure is lost. When one settles upon a level of detail in construct-

[11] For example, the final demand totals of the output rows of the input-output tables have been made consistent with the components of GNP. The input rows generate value-added totals that correspond to the components of national income ("Input-Output Structure of the U.S. Economy, 1963," *Survey of Current Business*, November 1969). The balance of payments accounts have also been integrated, for the most part, with acct. 4. The flow of funds accounts remain the responsibility of the Federal Reserve Board, and final integration has not been fully achieved. However, successive revisions have brought them fairly close to this sort of integration.

[12] See U.S., Bureau of the Budget, Review Committee for Balance of Payments Statistics, *The Balance of Payments Statistics of the U.S.*

ing a statistical entity, one precludes the representation of other elements of relationship that may be of considerable interest in alternative conceptual formulations.

Second, with respect to the national economic accounts conceived as an integrated set, one may wish to represent a set of relationships that link components of more than one of the statistical subentities but that cannot be traced through the links provided by integration or consolidation at the summary account level. For example, one might develop a concept of a set of relationships useful for analyzing industrial borrowing from commercial banks. For such a concept one might draw upon the relationships already defined in the flow of funds account but with the addition of the industry breakdown of the investment component of the input-output account. At this point one is confronted with the fact that the two accounts are sectored in different ways because they were constructed to give statistical representation to conceptual entities that do not match the entity in the example.

Both forms of the entity problem just discussed have in common the fact that the matching of statistical entities is obstructed by inherent differences in the entity concepts that define them. The third form seems quite different in character but is fundamentally similar. The interpretation of statistical entities is often obstructed by anomalies associated with the sources of data used to construct the accounts. In constructing such entities it is common to utilize measures and indicators generated for other purposes. Much of the data used to construct the national economic accounts are generated as a by-product of the administrative practices of industry and government. Thus, each series takes its form from the entity characteristics of the administrative system it is designed to serve. This practice often yields a measure that is inadequate as a component of a statistical entity differently conceived.[13]

The problem of integrating the flow of funds accounts with the input-output accounts directly (rather than through the intermediary of the summary totals of the income and product accounts) is partly of this nature. The flow of funds accounts are constructed out of company statistics generated by the business community. This is logical, as the company is typically the financial control entity. The input-output accounts are constructed out of establishment statistics. This, too, is logical, as the establishment is typically the production control entity. This presents no insurmountable problem to summary account integration at the level of the income and product accounts (although it creates some troublesome problems with the industry detail of acct. 1). It is thus extremely difficult to construct a representation of functional relationships that may be conceived as links in flow of funds and input-output account transactions. These distinctly different source entities provide no basis for a ready transformation of a sector of one account into units equivalent to a similar sector of the other account, even where their attributes can be reasonably matched.

This discussion yields two important conclusions. First, the integration of previously constructed integrated statistical systems into a higher order statistical entity does serve to resolve some of the entity problems that plagued the users of the independent entities. It serves to further amplify the information-generating capacity of the statistical system.

[13] Fortunately, the attributes of an indicator are often sufficiently general to serve a variety of integrated statistical entities. Where there are differences, they may be the result of accidental or inconsequential differences in practice of a kind that the generating agency can modify without serious penalty. At other times a logical way to transform one attribute into a related one that will serve the construction requirement better may be ready at hand. Much of the work in constructing statistical entities is this kind of matching.

Second, second-order integration cannot resolve all of the anomalous entity problems.

Emerging Interest in Social Accounts

Another manifestation of the ever-present entity problem is the emerging interest in "social accounts." Increasingly, critics are suggesting that we need to go beyond the representation of economic relationships to the representation of social relationships more broadly conceived. This criticism most commonly takes the form of recommendations for extending or reapplying the traditional social accounting paradigm.

As an illustration, consider a paper by Richard Stone in which he outlines the nature of an integrated system of demographic, manpower, and social statistics and their links with the system of national economic accounts.[14] Stone envisions an integrated set of accounts made up of subsystems or component accounts. Examples of his subsystems are population (age composition, births, survivals, etc.), migration, social mobility, learning activities, earning activities, family groupings, health, etc. Thus he explicitly extends into a broader range of social accounts the evolved concept of second-order integration.

As before, it is obvious that the motivating force behind innovative proposals of this type is the desire to resolve some of the entity problems associated with the national economic accounts. The established statistical entities do not adequately represent sets of relationships to which other concepts of social system give prominence. Notice that the proposed solutions amount to adding to existing statistical entities by applying the logic of second-order integration in order to develop a larger set of fixed, periodically maintained accounting tableaus.

This movement is still at the stage of conceptualizing statistical entities that would add to the representation of real world systems of interest. The construction of such entities is barely begun. Still, on the basis of our experience with the second-order integration of the economic accounts, we can make several observations about its prospects. First, the traditional social accounting paradigm is capable of application to the construction of many additional useful statistical entities. Their successful application will amplify the information yielded by their component indicators. Their further integration with each other and with existing statistical entities through the generation of important relational bridges will add further to their utility and will resolve some of the outstanding entity problems. Second, whatever the measure of achievement along these lines, unresolved entity problems will be inherent in the nature of the new constructions. Such proposals add nothing intrinsically new to the technology for dealing with the entity problem.

Regional and Urban Statistical Entities

The history of the national economic accounts also records the presence of a movement to disaggregate the national economic accounts into regional accounts.[15] This attempt affords an additional example of the

[14] United Nations, Economic and Social Council, Statistical Commission, *An Integrated System of Demographic Manpower and Social Statistics and Its Links with the System of National Economic Accounts.* See also a statement of these concerns originating with the problems of practicing government in Charles L. Schultze, "Governmental and Public Data Needs" (Washington, D.C.: The Brookings Institution, in preparation); see also F. Thomas Juster, "On the Measurement of Economic and Social Performance," *50th Annual Report* (New York: National Bureau of Economic Research, September 1970).

[15] This movement originated in a growing cadre of regional and urban economists and was promoted by the Committee on Regional Accounts of the Committee on Urban Economics. (See Werner Z. Hirsch, ed., *Elements of Regional Accounts* [Baltimore: Johns Hopkins Press, 1966]; Hirsch, *Regional Accounts for Policy Decisions* [Baltimore: Johns Hopkins Press, 1966]; Werner Hochwald, ed., *Design of Regional Accounts* [Baltimore: Johns Hopkins Press, 1961].)

entity problem, with two new twists. Regional accounts were initially intended to be a regional disaggregation rather than a subset of the national accounts of the kind already discussed. (The national accounts developed as an integration of different bundles of relationships for the same region—i.e., the Nation. Regional accounts were conceived as a representation of the same bundle of relationships for different regions.) The rationale behind such a move is the fact that economic relationships, in truth, tend to be bundled in two dimensions. First, activities tend to bundle functionally because each activity is not equally and indiscriminately related to every other activity. They bundle in systemic patterns of relationships that can be conceived as behavioral entities which we attempt to represent through the construction of integrated statistical entities. Because of the uneven distribution of resources and the spatial costs associated with economic transfers, these functional patterns of activities also tend to bundle into geographical clusters.

The attempt to disaggregate the economic accounts tended to founder because it encountered restrictive entity problems in two forms. First, the realization soon developed that the bundle of relationships represented by the income and product and flow of funds accounts were heavily influenced by macroeconomic and monetary concepts. However, the principal institutional forms of macroeconomic management and guidance are national in scope and are not duplicated at the regional level. Furthermore, we find that the trade and payments transactions with the outside world are only a minor fraction of the national accounts. For a region, these transactions become a major part of the total, and their representation (in gross rather than net dimension) forces the regional accounts to add the representation of a bundle of relationships not articulated in the national accounts. In short, the conceptual entity of the national accounts turns out not to be the set of relationships of chief interest for regional analysis. Second, even if the input-output and flow of funds accounts had proved to be a natural bundle of relationships for regional analysis, their disaggregation runs into the difficulty that some sources of data exhibit an inappropriate entity character. An important source of data is company statistics, some dimensions of which are not susceptible to regional disaggregation (e.g., corporate profits).

In the face of these entity problems, attention turned to the conversion of the input-output accounts to an interregional, interindustry tableau. In principle, this seems much more logical. The input-output tables are based upon a more appropriate source entity (the establishment), and functional production relationships certainly form regional bundles of interest. In fact, the disaggregation of the national input-output account proves to be no more feasible. It is widely assumed that this is because data sources are so inadequate, and this is true, but there is a more fundamental reason. Here we encounter the aggregation aspect of the entity problem already discussed. The bundle of production relationships that forms a systemic whole for the Nation is characteristically quite different from that bundle of relationships which forms a systemic whole for a region or urban system. Consequently, the sectoral detail that is appropriate for a national input-output account will not often represent adequately the collection of relationships appropriate for the region, and vice versa.[16]

Although a regional accounting analog of the national economic accounts has proved unproductive, OBE's Division of Regional

[16] As a consequence, regional input-output has in practice not been interregional input-output. Successful constructions have not been disaggregations of the national table. Rather, they have been applications of the generic interindustry model to a regional entity, i.e., intraregional input-output.

Economics is engaged in a useful program of regional statistics. It is significant for the theme of this paper to consider briefly what the Division is doing.

First, it is working its way in an experimental and pragmatic fashion toward constructing a set of regional statistical entities that will serve to describe and analyze regional differentials in general economic behavior. As now conceived, these entities will consist of disaggregations of the personal sector of the income and product account (personal income and its disposition through consumption, savings, and taxes) matched with a number of demographic and labor force variables. This project is undertaken with the full realization that the variety of private or public agents engaged in management or policy formulation in a regional context will be conceptually involved with a variety of relationship bundles. There is little chance that the Division could construct a variety of statistical entities sufficient to represent all of these possibilities. There is a belief, however, that it can construct a set of organized statistical data that will describe general economic relationships which not only form a useful representation standing alone but which also constitute a common, context-setting component in the construction of a variety of management and planning abstractions of a more specialized nature.

Second, the Division is not only confronted with a different kind of problem in bundling relationships for statistical representation but is also faced, for the first time, with the problem of coping with variations in geographical bundling. It has, therefore, the unique problem of selecting a set of regional descriptive categories for use in assembling the statistical representation of general regional economic behavior.

The Division has available some regional definitions of general utility, in the form of the jurisdictions of general government. It has gone further and constructed a logical set of regions designated as functional economic areas. These are nodal economic regions based upon measurements of central place functions. It does and will publish fixed tableaus based on such regional definitions, after the fashion established for the national accounts. However, this breakdown does not provide for the large number and variety of regional descriptive categories that form an appropriate basis for constructing regional statistical entities. For example, the Corps of Engineers may wish to use the watershed concept to define a region for public works planning; each river basin will define a different entity not comprehended by general-purpose regional formats. Analysis associated with planning a high-speed transportation system in the Northeast Corridor may define a region in terms of a hydra-headed urban metropolis. Market planning may sometimes encompass a nodal urban region, while in other cases it may embrace some combination of several such regions.

So diverse are such entity and statistical organization requirements that the Division is playing down the traditional publication of fixed tableaus and is organizing its program to *provide information services adaptable to the special regional entity requirements of the user.* They accomplish this by adopting the county as a basic accounting unit (over 3,000 in the U.S.). Consequently, they are able to provide statistical representations efficiently and economically for any regional entity that can be approximated by combining county units.[17]

These developments are of special interest in the evolutionary history being reported here because they represent innovative movements that go beyond the established paradigm of economic accounting. In the construction of functional statistical entities the Division is moving beyond relationships

[17] Statistical entities are not available on a county unit basis for some counties but can generally be constructed for most variations of combinations of counties.

defined exclusively in terms of economic transactions and is moving in the direction of a broader concept of social accounts. In the construction of regional statistical entities the Division is moving beyond the generation of fixed tableaus to the provision of statistical services as a service agency. This is one bit of evidence that a new phase in the evolution of integrated statistical systems may be emerging. I wish to examine the nature and implications of this emerging phase in the remaining sections of this paper.

THE TREND TOWARD A MORE GENERAL MODEL OF SOCIAL ACCOUNTING

Thus far the narrative has focused upon how the traditional concept of social accounting developed, on how different aspects of the entity problem inherent in constructing statistical entities are the anomalies generated by its practice, and on how the usually conceived extensions of this practice hold limited promise for dealing with this problem. Next I wish to call attention to another important aspect of the history of social accounting and related social science activities. Experience is leading toward further generalization of the accounting model. [18]

Basic to this shift is the realization that the (mathematical) matrix form provides a framework for generalized double entry accounting and its ramifications. The utilization of this form has already taken root in the national economic accounts. Intrinsically, it is the form of the input-output accounts. The work of Richard Stone, previously cited, gives evidence of an explicit tendency to move to a more widespread application of the matrix form. He reveals that the accounting matrix can be used to account for stocks (or state descriptions) of human populations and their flows and transformations in many attribute dimensions, as well as to account for economic resource stocks and the income and product flows they generate. He also sees the matrix as capable of manipulation to generate transformation coefficients and is sensitive to the fact that triangularity in an empirical matrix is evidence of functional decomposability. The applications he proposes imply that the accounting framework is a more generic descriptive and analytical one than it is conventionally conceived to be.

This theme receives more explicit treatment in a paper on statistical economics published by Rosenblatt. He describes the generic power of the balanced matrix and its related mathematical theory and shows how this allows one to move with ease from a traditional accounting formulation to a matrix formulation and vice versa. [19] The matrix formulation, in turn, is capable of generating (through its associated mathematics) related transformation matrices, Markov chain formulations, simulation approaches, etc. It is interesting to note that the same kind of development in accounting concepts is taking place in the more traditional field of business accounting.[20]

The significance of this development is not readily seen. One needs to appreciate the fact that the potential of the matrix form is far more than an alternative format for presentation. It makes a major contribution to the statement and resolution of problems related to the structural transformation and numerical analysis of economic accounting

[18] Unfortunately, one cannot hope to deal with this topic adequately in a few brief pages. It is worth an extended article of its own. I am especially indebted to David Rosenblatt for assistance in preparing this section.

[19] The full double entry logic of traditional accounting can be seen as a clever means of closing the system in such a way that the transactions details are thrown away and one then deals primarily with the matrix (balance sheet) rows and columns defined by the logic of closure (see Richard Mattessich, *Accounting and Analytical Methods* [Homewood, Ill.: Richard D. Irwin, 1964]; Rosenblatt, "On Some Aspects of Models of Complex Behavioral Systems").

[20] See Mattessich, *Accounting and Analytical Methods*, for references to earlier work in this domain.

tableaus. One of the characteristics of an integrated statistical information system outlined above is the capability of using the system to project its own level and structure. It is precisely these aspects of structural and numerical analysis that the matrix form facilitates because it organizes the data in a way compatible with all of the analytical power and computational modes of matrix algebra. For example, the matrix formulation of input-output accounts makes evident the nature, utility, and economy of matrix inversion procedures in the protection of transaction tableaus in the form of the open Leontief model (we distinguish here between the symbolic and the numerical analysis utilities of a matrix inverse). The matrix representation can take a dynamic or static form depending on how one defines the analytical entity. This opens up the possibility of creating a theoretical but useful system dynamics based upon Markov chain formulations, simulation techniques, etc.[21]—a dynamics which may be traced back to the stationary process of the classical tableau economique.

Beyond facilitating numerical analysis in the technical sense, there are many problems of statistical adjustment that are most concisely and effectively treated in matrix form; e.g., in the testing of the levels of aggregation appropriate to certain system representations.[22] It makes clear the consequence from both an accounting and a modeling point of view of adding or removing rows and columns in an input-output or multisector model. The use of transformation tables in entity matching (to be discussed below) depends upon matrix formulation. Indeed, the most efficient modes of large-scale computation using modern computers require a fundamental understanding of the role of matrix theory in numerical analysis. Perhaps most important conceptually, matrix theory provides us with important elements of both the logic and the mathematics of the structure and transformation of systems and exhibits important connections with network and graph theories which have already been applied to certain structural problems in resource accounting.[23] In short, it appears that there is emerging a more generalized concept of social accounting and a more generalized operational technology for integrated information systems. This constitutes an important development in the evolutionary process being narrated.

A SECOND PARADIGM SHIFT

In an earlier section of this paper the emergence of the traditional social accounting concept was viewed as a paradigm shift in the sense employed by Kuhn. I now suggest that a second paradigm shift may be emerging. It is not fully formed, and we are not yet fully sensitive to the possibility. There are early warning signals manifest in the anomalies that take the form of the generic entity problem and the trend toward more general concepts of social accounting. Before we consider the nature of the emerging shift, it is worth emphasizing that the entity problem which lies at its root is becoming further intensified by a historical shift taking place in the nature of information requirements.

The Entity Problem Is Increasing

We can understand the nature of this change if we use Kuhn's distinction between

[21] Or, indeed, the shift-share model so successfully employed by the Division of Regional Economics of OBE (see OBE's *Growth Patterns in Employment by County* [Washington, D.C.: U.S. Government Printing Office, 1965]; also Lowell D. Ashby, *Regional Change in a National Setting*, OBE Staff Paper in Economics and Statistics No. 7, 1964). Furthermore, the matrix mechanics makes it possible to imagine new ways of utilizing the basic accounting tableaus by exploring the differing structures of all the solutions of a system of this kind.

[22] For example, the significance for economic calculation, in many senses, of the triangular organization of nonzero entries in an input-output matrix is made evident by matrix theory.

[23] See the paper by A. Charnes, W. W. Cooper, and Y. Ijiri, "Breakeven Budgeting and Programming for Goals," *Journal of Accounting Research* 1 (1963):16–43.

normal science and the paradigm shift to make an important distinction in the activities characteristic of organizations and social systems.[24] Corresponding to the normal work of science (the orderly cumulative work addressed to filling out the implications of the paradigm as a controlling concept) is the normal activity of social organizations (the day-to-day activities essential to fulfilling established organizational objectives). Every social organization is functionally defined by a boundary composed of explicit and implicit goals and objectives (whether it is engaged in manufacturing refrigerators for profit or managing the Nation's money supply in the interest of economic stability). The work in organizations corresponding to Kuhn's normal science we call management. It consists of the routine responses to environmental change necessary to maintain a mix and level of activities consistent with organizational objectives.

The information which serves this function is essentially of two types: simple indicators that monitor environmental change and organizational response and an integrated statistical system that corresponds closely enough to the major relationships in total system behavior to permit some aspects of evaluation and guidance. We have been discussing the evolution of these information systems.

But organizations and social systems frequently encounter problems not adequately resolved within the context of existing objectives and behavioral capabilities. Their solution requires the system to *develop a different behavioral capacity* and even to reformulate the concept of the mission which organizes its behavior. Such changes in goals and objectives inevitably imply changes in the bundle of relationships conceived to define a social behavioral entity. Consequently, a traditional set of accounts designed to serve the management of an established behavioral entity can rarely represent adequately the novel bundle of relationships that define a developmental entity. Thus, developmental problemsolving encounters the need for integrated statistical entities not comprehended in existing formats. Recent social history suggests that increasingly the major problems confronting both public and private policy are developmental rather than managerial in form. Integrated statistical systems, as they have evolved to date, are designed primarily to serve management functions. Attempts to utilize these tools in the service of developmental problemsolving encounter the entity problem more and more frequently, but in a novel and demanding context.[25]

The Nature of the Emerging Shift

An integrated statistical information system that can serve these emerging requirements must exhibit two capabilities not embraced by the traditional concept of social accounting. First, the system should be sufficiently flexible to deal adequately with the entity problem. The fundamental problem confronting the user of statistics is that of fitting together data from diverse sources in

[24] The importance of viewing the organization of social behavior and its change over time in this manner has been treated at length by me in another publication (*Economic and Social Development: A Process of Social Learning*).

[25] The reader should be warned that I am making a careful distinction here between development and growth—two terms commonly used interchangeably and ambiguously in the economics literature. By growth I mean changes in the level or scale of a systems activity. By development I mean changes in behavior or in the organized bundles of relationships that define the system. I should not be interpreted to imply that the national economic accounts do not provide a very useful gross indicator of growth and a somewhat less useful entity for analysis and limited management of growth as a change in scale of the system defined. However, they certainly have little, if any, capacity for representing the changes in the bundle of relationships that attend system development. See *ibid.*, pp. 8–10, for a more complete explanation.

such a way that they usefully represent social and behavioral entities different from those already represented by existing statistical entities. A management problem may require constructing a statistical account that reflects the behavior of an established system, provided that standard statistical services do not already construct such tableaus in appropriate form. A developmental problem may require the construction of a statistical entity that will represent not an existing real world system but a potential real world system (in a systems planning or policy formulation sense), conceived to offer possibilities for appropriately altered behavior.

Central to the new paradigm is the concept of a statistical information system with the capacity for providing consistent empirical content for a changing range of entity concepts as a "job shop" service.[26] Such a capability is essential to meet efficiently and feasibly the novel analytical and developmental requirements of all levels of government, of specialized resource management organizations, and of academic research. It requires the capability (through the use of master samples, matrix techniques, etc.) not only of producing data to fill out the requirements of experimental entities, but also of generating the transformation tables and reconciliation measures essential to articulating all of the relationships represented into a consistent, integrated system. It also requires the capacity for assisting the user to see the problem of developing an adequate statistical entity in terms of a series of design options, which might include developing a new statistical series, transforming or reconciling established statistical series, modifying in some way the concept of the desired statistical entity, or some combination of these options.[27]

As an example of the meaning of design options, consider one of the difficult entity problems involved in the trend to second-order integration of the national economic accounts: the fact that some data are generated on a company basis and some on an establishment basis. It was pointed out in the discussion above that this suits well the construction of the flow of funds and the input-output accounts, respectively, but that it creates major obstacles to their second-order integration.

There may be three possible ways of circumventing this problem. One might require the companies to produce the same attributes on a company basis as are commonly reported for establishments. This would permit linking relationships to be established.[28] A second possibility is that an integrated statistical servicing agency might use a carefully designed and maintained master sample to generate a cross-tabulation of some of the company attributes on some of the establishment attributes. This could then be used as a transformation table in transducing a statistical entity based upon

[26] This term implies the servicing capacity for representing a variety of bundles of relationships for the same geographical entity as well as a variety of geographical entities for the same bundle of relationships. (We see that the Division of Regional Economics is already preparing to do the latter in a limited way.)

[27] In their recent paper Rosenblatt, Glaser, and Wood speak of "the principle of development of regular transformations between alternative systems of classification and aggregation based upon mathematical and statistical analysis of empirical materials drawn from a series of well designed sample 'matching' and 'linkage' studies" (David Rosenblatt, Ezra Glaser, and Marshall K. Wood, "Principles of Design and Appraisal of Statistical Information Systems," *The American Statistician* 24 [1970]:14–15). They articulate important characteristics of the emerging paradigm of the integrated statistical system and point out general implications for further development. I have drawn heavily upon insights provided by this effort. Unfortunately, the economy of language employed in that paper will prevent many readers from appreciating its far-reaching implications and the fundamental shift in concepts of the kind being discussed here which it proposes.

[28] Orcutt has discussed the fact that the statistical system may need to do more of this kind of thing in the future if we are to develop an adequate statistical information system (see Guy H. Orcutt, "Data, Research and Government," *American Economic Review* 60 [1970]:132–70).

company attributes into an adequate matching relationship with one based upon establishment attributes. It may be that an alternative to integrating these two accounting entities can be found by generating a third accounting entity. In principle, there is no reason why an input-output account could not be generated utilizing purchases and sales on a company basis. In doing so one would have to give up the production function concept of the input-output account and settle for a different level of organizational detail and attributive character. It may very well be, however, that the integration of the flow of funds account with such an alternative input-output representation may serve to represent the desired modified bundle of relationships as well or even better from an empirical standpoint.

It may be that all or some of these design options are not practicable in this case. I am merely attempting to make the organizational issue more concrete through illustrative example. But the essential point is that what may be an unattainable design alternative at the level of an Office of Business Economics, given its resources and traditional social accounting mission, may be realistic at the level of an overarching integrated statistical service system which can justify this need by demonstrating that it is one held in common with other statistical entities, which can provide established techniques for making such design alternatives feasible, and which can view the design alternatives available for each task of statistical construction in terms of the higher order design of a technology and organizational capacity for servicing the requirements of a changing variety of statistical entities. This suggestion also makes plain that the development of such an integrated statistical servicing system will do more than facilitate the construction of new statistical entities not conceived as conventional accounting tableaus. It may also be essential in facilitating the solution of that part of the entity problem which cannot be handled through the extension and second-order integration of conventional social accounts.

This couches the problem of statistical design in different terms. It represents a fundamental shift in perspective. In the traditional social accounting concept one thinks in terms of the design and production of a statistical product—the conventional accounting entity. The design options that can be considered under such a concept are typically constrained by the tendency or presumed requirement for settling upon a "best" option and by the fact that the construction is generally presumed to rely upon the assembly of existing data resources—with such variations and adjustments as are readily possible for a secondary statistical agency. The paradigm that emerges is not so much concerned with the production design of a statistical *product* as with the design and operation of a statistical production *process*. The design problem is viewed as one of establishing general principles and techniques of construction and transformation of a variety of integrated statistical entities—the design of an integrated statistical servicing system capable of widening the design options available for the construction of each statistical entity. This is a very difficult thing to do. Some of the techniques are implicit in the adjustment techniques often employed in the construction of traditional accounts and are susceptible to further generalization in their application to a wider range of construction efforts. New technologies will need to be developed as well. These are aspects of statistical technology that have received comparatively little formal treatment.[29]

[29] Indeed, central to the design of an integrated statistical servicing system of the kind discussed are the highlighting, formalizing, and extending through technological innovation of just those aspects of the construction of social accounts that have heretofore constituted the somewhat occult arts employed by the statistician to fill in the design of each account. That which is commonly thought to be subsidiary and least systematic in the construction of a social account needs to be made central to (and formally systematic in) the design of an integrated statistical servicing system.

This brings us logically to the second capability of the new paradigm that is not embraced in the traditional concept of social accounting. Here emphasis shifts to matrix representation as an alternative accounting format and to the way in which this format makes possible the direct utilization in integrated statistical information systems of the powerful formal developments in "mathematical accounting" (which term we take to subsume the application of algebraic, relational, and graph and network theories to problems of micro and macroaccounting). The significance of this emerging development has already been discussed.

The new paradigm has two noteworthy aspects to its nature. First, this developing technology holds the promise of greatly enhancing the fourth characteristic of an integrated statistical system identified early in this paper, i.e., the capability of using the system to project its own level and structure. We earlier discussed, for example, the power of the computational modes of matrix algebra to facilitate the quantitative analysis of the structure as well as the dynamics of statistical entities. Embedding these capabilities in the basic design of an integrated statistical service system can make a great contribution to generating useful statistical entities.[30] Second, a more generalized concept of social accounting that embraces the associated mathematical modes is essential in the design of an integrated statistical service system. The transformation techniques and the resolution of various approaches to aggregation problems so essential to the flexible construction and matching of statistical entities is dependent upon this technology. In commenting upon his articles, cited earlier, Rosenblatt has further emphasized to me that the future development of the design and construction of such a statistical system is highly dependent upon innovative applications of developments in the domain designated as "mathematical accounting."

In sum, the emerging paradigm of an integrated statistical information service system implies a capacity for flexible and efficient construction and matching of statistical entities in a choice of traditional accounting and matrix formats serviced by a variety of techniques for analyzing the structure and dynamics of such entities. The conception provides that each construction alternative can be provided (or serviced in its construction) by the statistical information system.

Three Inadequate Solutions

In the face of the serious entity problems inherent in the traditional social accounting paradigm, there have emerged several images of the nature of the solution. I would maintain that they are inadequate or incomplete as presently formulated and that their constructive elements are subsumed in the paradigm this paper has attempted to portray.

First, there is the solution of the extended tableau. When entity problems are encountered, statisticians operating out of a framework of conventional social accounting concepts are inclined to see solutions in terms of the modification of conventional statistical entities, their second-order integration, the reapplication of the concept to produce additional tableaus, or some combination of these methods. What Stone and Juster are proposing can certainly be interpreted in this way. Earlier discussions have already made two things adequately clear: that such adjustments do make a contribution to the solution of some entity problems but that these adaptations do not really get at the root of the entity problem and that the successful extension of traditional accounting practice will itself require the support of an integrated statistical information servicing system. (One of the reasons why traditional economic accounting tableaus have presented so many stubborn entity problems may well be the fact that, in their construction, they have not had available the supporting presence of an integrated statistical servicing system.)

[30] A point emphasized at greater length in my report to the Bureau of the Budget; see *Review of Proposals for a National Data Center*, Office of Statistical Standards Statistical Evaluation Report 6 (Washington, D.C.: U.S. Bureau of the Budget, 1965).

The second inadequate solution is the technological one. In the minds of many people the solution to the entity problem is to build a gigantic national data bank into which all the numbers stacked away in the back rooms could be filed, along with new numbers as fast as they are generated. It is assumed that we could then utilize the great technological capabilities of the computer to associate instantaneously any number or data set with any other number or data set to fashion any kind of statistical entity. I have characterized this elsewhere as the naive data bank concept.[31] It simply cannot do the job. This technological system provides little more than storage, retrieval, and computational capacity. It cannot retrieve data that do not exist and it contains no procedures for providing special-purpose data when required. It offers the technological capacity to arrange data in different tableaus flexibly but offers no assurance that they match well enough to depict a meaningful bundle of relationships. Such organizational capabilities are not inherent in the technological design of the information handling and computational capabilities of the computer. They have to be supplied by the new design paradigm and the institutional structure that can give it effect. At the same time, there would be no hope at all for the kind of integrated statistical information service implied in that paradigm if such a system could not exploit the new computer technology.

A third reaction to the anomalies of the traditional paradigm is a retreat to partial, ad hoc solutions. Some express disbelief that either the traditional accounting paradigm or the new paradigm offer hope for developing experimental statistical entities through the establishment of a national integrated statistical servicing system. They would recommend that universities and research institutes be funded to develop special-purpose statistical data and to construct experimental statistical entities. This is what I understand the view of Orcutt to be.[32]

Proponents of the new paradigm would claim that these partial solutions cannot be made to work effectively without access to the broader integrated statistical servicing capability implied in the design paradigm. At some point the construction of experimental statistical entities will require access to some combination of matching, design, data, and computing services of a kind that private, partial systems would ordinarily find it difficult, if not impossible, to organize. The paradigm shift will inevitably require a substantial shift in the organization of the statistical systems necessary to give it effect. It will certainly require some form of functional centralization of statistical control and coordination. It will require financial and intellectual resources on a scale that only centralized coordination of essential resources will make possible. Something like the focal institutional position and resources of the Federal Government will be necessary to do the job.[33]

One thing is clear: we will need the contributions and criticisms of the universities and research institutes in developing the new paradigm, for it is intended to serve their analytical and research needs as well as those of industry, commerce, and government at all levels. Just as it subsumes the traditional social accounting paradigm, it can also embrace the notion of partial, private statistical systems. Indeed, I would imagine that it might work out best in practice if many activities were carried out in research institutes and policy planning agencies not institutionally a part of a national integrated statistical information service center. Once

[31] See *ibid.* and "The Information Utility and the National Data Bank," in *The Information Utility and Social Choice*, ed. Harold Sackman and Norman Nie (Montvale, N.J.: AFIPS Press, 1970).

[32] "Data, Research and Government."

[33] This need not rule out the possibility of a public-private consortium supported by governments, businesses, universities, and research institutes. In fact, such an alternative to a national Government system might have much to recommend it.

again, however, it would be the existence of such a statistical system design and such a servicing agency that would give utility to these efforts. It is the existence of such a capability that would open the door to a variety of useful decentralized statistical systems in direct association with management, research, and planning processes throughout society.[34]

Obstacles to Development

At this juncture one might ask: realistically, is it possible to establish such an expanded capability? There is only one way to find out, and that is to try. I hold a conditional faith that it can be done and a conditional conviction that it must be done if the social process is ever to bring the developmental process under the kind of guidance that can both serve and illuminate human purposes. In a period of accelerating technological and cultural change and massive international conflict, the development of such aids to evaluating and modeling both public and private options might in time spell the difference between a viable and a nonviable social process. These are potential payoffs of great consequence.

At the same time we can recognize the numerous obstacles that exist. The most serious of these, in line with the thesis of this article, is the fact that most social science professionals, most Government statisticians, and most public and private managers are still attached to some version of a more limited paradigm. There is widespread sensitivity to the anomalies associated with the traditional concepts and procedures and a great deal of restiveness is apparent, but a widespread shift in concept and orientation of the kind outlined here is not yet manifest. Some such shift in the "world view" of the "statistical establishment" is essential before much progress can be made.

Another set of obstacles has to do with serious discrepancies between private and social payoffs. By and large, the members of the social science professions are provided little incentive to work in this domain of applied work. Juster points a sharp finger at this problem.[35] The conscientious Government statistician is similarly plagued. The budgeting and program review process is contrived in such a way that a statistical administrator who proposes an innovation in mission or procedure thereby runs a big risk of jeopardizing support for his established mission. Similarly, the politician in the legislative and administrative process who might be able to do something about this runs substantial political risks and sustains limited political gains if he invests much energy in a set of problems so devoid of a current political constituency and so beset with technological complexity, even where future social benefits may be quite substantial.

The disjointed character of private and social rewards can only be dealt with if the new paradigm comes to gain a prominent place in the thinking of the statistical producers and users. Before we can proceed that far, the new paradigm must be more thoroughly developed and articulated. Certainly the image developed here and in the articles cited is embryonic, from an operational point of view. It is essential that high-level professional attention be given to developmental and design research pertaining to this form of integrated statistical service information system. The importance of this next stage of statistical development is so great that it deserves a far greater commitment than it has received from all segments of our society which depend upon relevant information for rational action.

[34] The beginnings of such a concept (but without adequate articulation) were embodied in my report to the Bureau of the Budget.

[35] F. Thomas Juster, "Microdata, Economic Research, and the Production of Economic Knowledge," *American Economic Review* 60 (1970):144–45.

OTTO ECKSTEIN

A Model-Builder's View of the National Income Accounts

10

Birthdays are no time for retrospection, at least not at the age of fifty. Too much still lies ahead, and the rate of progress of economic science reported in the *Survey* is still accelerating. So without unnecessary plaudits for the past, let me advance some suggestions for future possibilities in the main work of OBE, the national income accounts.

The national income accounts have become the central statistical construct for measuring the dimensions of the American economy: they provide an internally consistent and theoretically explicable set of measures; they are also able to assimilate information from most of the basic information sources that we have for the economy. Through the procedures of national income accounting, the initially incommensurate data from retail sales reports, construction reports, wage and employment statistics, financial reports of corporations, censuses of governments and the Federal budget, foreign trade statistics, and numerous other sources are converted into a set of figures which measure the economy itself. Today, there are other coherent statistical systems which portray the economy: the flow of funds statistics, the input-output matrices, and the production indices as well. But none seriously rival the national income accounts in their ability to combine data from different sources.

It is small wonder that econometric models are organized in terms of the concepts of the national income accounts. The models require that identities add up, that there be room for total spending and total income, and that the behavioral assumptions of theory about households, businesses, and governments be expressed as workable macroeconomic relationships. As a model-builder, I therefore have a particular interest in the further development of the national income accounts. In this spirit, let me suggest a few possible paths of development.

EXPLANATION OF ESTIMATING METHODS

The user of the national income accounts would become more sophisticated if the accounts showed more explicitly how the major data sources are processed. To be sure, the data entering the preliminary estimates are more fragmentary, and some are simply from different sources than the benchmark data which ultimately establish the revised quarterly values. Nonetheless, the present lack of periodic information on the steps that take the national income statistician from his raw data (which, when they reach him, have already been highly processed by the originating agencies) to his finished national income account leads to some misinterpretation and a lack of appreciation of the actual information contained. The innocent user may not link the Census Bureau retail sales data to the consumption estimates, nor may he understand the various roles played by the establishment payroll data. A few tables could be added to the regularly published accounts that show the basic estimation process. Now that monthly national income accounts are in the offing, the case for spelling out more

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precisely how to go from the data to the accounts becomes even stronger. The monthly GNP data will show erratic movements. Users will have to be taught to accept the realities of the random component in economic time series and of measurement error. It would be far more desirable to show the erratic pattern of the underlying data in the monthly accounts than to present them in a smoother, and hence more judgmental, form.

COMPUTERIZATION

I would argue for a generally more mechanistic approach to the production of the national income accounts. Peter Jones and I have recently developed a very simple econometric model which crudely simulates the procedures by which OBE converts the basic monthly data into the quarterly preliminary GNP estimates. This experience persuades us that the basic results can be obtained without relying on a large proportion of human judgment. There may even be a case for substantially computerizing the construction of the national income account estimates, subject, of course, to careful annual revision.

OPTIMAL SETS OF INDICATORS

Within the vastness of the Department of Commerce there has been ample room for both the national income accounts reported fully in the *Survey of Current Business* and the leading indicator system embodied in *Business Cycle Developments*. In recent years there has been some mutual recognition: *BCD* now summarizes the accounts, and, of course, *SCB* has always listed a good many of the indicators. Indeed, the chart material near the beginning of each issue is beginning to look suspiciously like *BCD*. But intellectually and conceptually the two approaches have really remained on separate tracks, and to the mutual disadvantage of both. The national income accounts are dominated by coincident indicators, which contain much information about the current developments of the economy but frequently do not give much clue to what is just ahead. The leading indicators emphasize the economic process but have no consistency or adding-up properties to make them suitable for modelbuilding, or indeed for any other sophisticated form of theoretical interpretation.

Can the two approaches be melded? There are some possibilities: suppose we take each category of final demand and identify the particular leading indicators which best forecast it. The result would not be all that different from the classifications that are already found in *BCD*. But if formal econometric approaches were applied to the problem in order to identify the optimal set of indicators for each component, the national income accounts would become more useful as a clue to the future, and the leading indicators would begin to add up. Every experienced forecaster I know engages in a process that crudely approximates this procedure in any event. Why not have the process embodied in the Federal statistical system?

The users of statistics are insatiable. Whatever new material the *Survey of Current Business* will include in the next fifty years, we can be certain that it will only whet our appetite for more. But then, isn't that how we have come so far?

ROBERT EISNER

New Twists to Income and Product

11

The national income and product accounts reported in the *Survey of Current Business* have doubtless been among the major contributions of this century to economic knowledge. Wedded to the great innovations in macroeconomic theory dating to the nineteen thirties, the contribution of the accounts themselves has perhaps at times been underestimated. We all know the pitfalls of measurement without theory, but we may occasionally forget the strength and life that theory must draw from measurement. A generation of economists and practitioners has been able to use the theoretical constructs of income, output, investment, consumption, and government expenditures for goods and services together with all the fine detail and soundly meshed interrelations of the actual numbers of our remarkable accounts.

CONSUMPTION, INVESTMENT, OUTPUT

But now, as our theory develops and as institutional arrangements change, old concepts develop new implications, and it is time to look to innovations or alternative arrangements and presentations of the underlying data. In particular, we should explore again the issues implicit in measurement of consumption, investment, income, and output in the private and government sectors in the light of recent formulations of behavioral relations involving consumption, investment, and production. Thus, the theory of consumption relates to consumer services, whether produced in the household or in business or government enterprise. The theory of saving and investment relates to the accumulation of capital, whether in physical or human form, whether in the household, business, or government. And all production is a function of labor services and the services of capital, in whatever form they are embodied and however they are owned or whatever are their relations to market transactions.

In terms of a concept of income which is the sum of consumption services and additions to capital or net worth in the household, business, or government (including our account with the rest of the world), we find currently substantial items of income which are not usually counted as income. These items have been termed "nonincome income": this income turns up, in varying proportions, in such categories as capital gains (both realized and unrealized), expense accounts, values of stock options, services of capital owned by government, additions to reserves of natural resources, educational services constituting both investment and consumption, and in the vast amounts of household production utilizing services of housewives and consumer capital.

How are we to proceed if upper-income groups enjoy consumption services and additions to their own net worth far in excess of what we currently measure as their income? What are we to do when increments in output are far in excess of what we can attribute to the increments in our measured inputs of labor services and the services of capital? How are we to handle the vast shifts of production as between market and nonmarket transactions—the latter relating either to the household or to government? How are we to account for accumulation of capital which may bear little relation to the excess of gross investment over largely tax-guided depreciation and capital consumption allowances, which

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we call net investment? And is not reconsideration of the issue of what constitutes intermediate products past due? What about the investment in knowledge constituted by research and development expenditures? And what about the lush living in executive suites and business lunches, the entertainment and travel, the media services and entertainment paid for out of advertising budgets, the cost of commuting to work and of protection of life and property by local police forces or the armed forces of the Nation? Which of these items currently counted as intermediate product should be recognized as consumption or investment? And which now counted as final product might better be viewed as intermediate? And should we perhaps be counting the development of our natural resources as capital accumulation or investment, and their destruction as capital consumption to be netted from output in calculating net national product and national income?

Readers of these comments should be aware of a growing body of work by John Kendrick, Richard and Nancy Ruggles, and J. Thomas Juster which has been addressed to these problems, and by Michael McElroy, Allan Mendelowitz, Wolfhard Ramm, and others, who have been associated with Arthur Treadway and myself in developing concepts and estimates of "nonincome income." It may be hoped that as small-scale, private investigation of these matters indicates the feasibility as well as the importance of revision or alternative presentations of income and product accounts, the Office of Business Economics and its major medium, the *Survey of Current Business,* will get on with the job.

DOUGLAS H. ELDRIDGE

Congratulations from the National Bureau

12

On the occasion of the fiftieth anniversary issue of the *Survey of Current Business*, the National Bureau of Economic Research sends its congratulations to the Office of Business Economics. We, who are also concerned with economic factfinding and analyses, especially appreciate the work of OBE, the progress it has achieved, and the openmindedness with which it continues to seek improvements in the availability and usefulness of economic data.

The great increase in the quantity and enhancement in the quality of economic and other statistics published since 1921 by OBE and its predecessor agencies in the Department of Commerce reflect the energy, enterprise, and devotion of an outstanding professional staff. The staff deserves great credit also for its valuable analyses of the statistics. A great deal of what is known about the structure and behavior of the U.S. economy, and about its economic relations with other countries, is a result of these analyses.

DEVELOPMENT OF NATIONAL ACCOUNTS

The work of OBE has been cumulative not only in providing a record of economic activity but also in developing the tools and techniques for a better understanding of the operations of our economy. For more than three decades OBE has been shaping and elaborating an interlocking set of national economic accounts which provide the basic ingredients for much of the empirical analysis of the performance of the U.S. economy. The development of full-scale econometric models, while still not complete, would not have been carried this far without the concepts and data provided by the income and product accounts. Analyses of the distribution of income could not be carried very far without the work of OBE on imputations for those nonmarket activities which are close counterparts of market activities, e.g., owner-occupied housing services, services of financial intermediaries, and income in kind provided by business firms. For the ingenuity, effort, and high-quality scholarship and workmanship that have gone into the development of the accounts, OBE deserves the gratitude of the economics profession and, we believe, of the general public.

OBE is also to be commended on its willingness to subject its procedures and results to professional criticism. For example, one of the most important meetings held by the Conference on Research in Income and Wealth was devoted to a critique of the U.S. income and product accounts. (The full record is published as No. 22 of Studies in Income and Wealth.) This meeting would not have been possible without the fullest cooperation of OBE. Many other meetings of this conference group have also provided opportunities for economists outside OBE to learn about the Office's work on income and wealth, to review its results, and to contribute to its improvement. Also important over the years has been OBE's willingness to provide many unpublished data to the National Bureau and to others with research interests.

EXPANSION OF INVESTMENT ACCOUNTS

Consumer and Government Durables

We at the National Bureau would like to urge OBE to further elaborate and refine the economic accounts of the U.S. As a short-range goal, it would be useful if OBE could expand its investment accounts to include household and government sectors as well as a business sector. For purposes of analysis, expenditures on owner-occupied housing represent a different kind of decision from those on construction of rental housing. Purchases of major consumer durable goods like mobile homes, automobiles, and some household appliances may be more appropriately

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viewed as involving capital investment decisions than as consumption expenditures. The housing sector is perhaps especially important; recent diversification in U.S. housing expenditures with the rapid growth in mobile home construction suggests that more detailed elaboration of housing expenditures would yield considerable benefits both in measurement of output and in analysis of decisions. Elaboration of capital accounts along the lines suggested would also provide estimates of personal and national savings that would be more revealing in a behavioral sense. We recognize the essentially arbitrary distinction between consumer expenditures that are best viewed as providing a flow of current services and those to be regarded as capital outlays for both current and future services. Nonetheless, we feel confident that OBE could develop classifications based on criteria no more arbitrary than the ones currently employed, and we hope that it will have the resources needed to investigate these suggestions.

Nonmarket Activities

We would also like to see OBE experiment with an expansion, or supplementing, of the accounts to incorporate a wider range of human activities than that part representing employment for compensation. Information on how nonmarket time is allocated among various socioeconomic groups in the population, as well as over time for the same groups, is of great importance in examining a wide range of analytical questions. For example, we may expect that post-schooling investments in learning by employed members of the labor force will be strongly associated with rates of increase in future earnings, that investments in preschool children by parents will be strongly correlated with subsequent rates of progress by those children in school, and that differences in parental investments among population subgroups may account in some measure for differences in learning rates in school. Finally, differences in nonmarket activities between those representing pure leisure and those with a close correspondence to the market are of great interest and importance for understanding human behavior. The data needed to expand the economic accounts in this way can only be obtained from an extensive and continuous study of time budgets for a sample of households. Data of this sort have been collected sporadically in the U.S., but no set of information now available contains the detailed characteristics of nonmarket activities needed to implement these research proposals.

CAPITAL REPLACEMENT COST

The OBE capital stock study and related studies of depreciation and capital formation are among its major enterprises. These studies now make it possible for OBE to introduce replacement cost accounting in its calculation of capital consumption and to provide an estimate of net national product in constant prices.

OBE–NBER MODELBUILDING

We at the National Bureau are also highly appreciative of OBE's work on econometric models, both in developing a model for its own use and in cooperating with National Bureau research programs to evaluate the nature of forecasts made by full-scale models of the economy. Such National Bureau studies would not be feasible without the help and close cooperation of the model-builders, and both have been forthcoming from OBE.

INTERNATIONAL ACCOUNTS

Those engaged in international studies at the National Bureau are particularly indebted

to OBE for the wealth and quality of information it regularly provides on this country's international payments and investment position. Its work in this area is commensurate with the unique role played by the U.S. in international finance and is marked by a commendable forthrightness in making the pertinent facts available.

Import-Export Price Indices

An important missing element is proper price indices for merchandise exports and imports, which are urgently needed for the analysis of the huge trade component of our international payments. We recognize, however, that such indices are not the responsibility of OBE and, further, that methods of price measurement must be worked out in common with other countries so as to permit meaningful comparisons of relative price trends. We trust that the National Bureau's contribution to improved methods of price measurement in international trade will prove to be a useful complement to the work of OBE.

Direct Overseas Investment

In the field of direct investment, the U.S. has far outdistanced the rest of the world with respect to the completeness and detail of its data and the variety of subjects covered. The superiority of the American statistics, as published by the Balance of Payments Division of OBE, is so great that most studies of particular foreign countries rely mainly on the U.S. data rather than on those from the country being examined.

Despite the relative superiority of U.S. information in this field, however, our knowledge of the causes and effects of direct investment falls short of our needs. We are still uncertain, over a wide range of possibilities, as to the extent to which American investment adds to or replaces investments by others, including natives of the host country, and the degree to which overseas production replaces or supplements U.S. production, whether for export or for consumption in the U.S. We have conjectures about, but little analysis of, the flow of technological skills from American parent firms through their foreign affiliates and vice versa, or of the determinants of the flow of payments for these services or for returns on U.S. capital.

It is not certain that all of these questions are amenable to an analysis based on the data already collected by OBE, but it is clear that some valuable explorations of causes and effects could be made. Considering the importance of the problems and the cost of data collection, including the heavy costs borne by private firms in supplying information, the existing data are grossly underutilized, mainly because the Balance of Payments Division has never had adequate resources to analyze these data or to foster their analysis by others. The most feasible solution would be to provide the Balance of Payments Division with enough resources, both financial and human, to organize the data already collected into a data system on the overseas operations of U.S. companies for the use of both government and academic investigators. This could be done, without breaking confidentiality requirements, by having statistical operations and tests performed by the data bank managers to the order and at the expense of the outside investigators. Such a data system would not only be a spur to research on the international corporation but could also be a major enhancement of the value of the Government's statistical efforts.

These comments will, we hope, assure you of the great interest of the National Bureau in the work that OBE has done and its potential for further development. We look forward to continuing to cooperate on the many economic problems in which we have common interests.

MARTIN R. GAINSBRUGH

13

Measuring the Nation's Wealth

My colleagues here at The Conference Board join me in extending warmest congratulations on the occasion of the fiftieth anniversary of the *Survey of Current Business*. Throughout the past decades we have grown to rely ever more heavily on the *Survey* as the journal of record for our system of economic and business intelligence. In addition, we have benefited by the analytical articles that have appeared in greater number and depth during more recent years. We have noted with pleasure, too, the extent to which, through charts and typographical changes, the *Survey* is now more "open" and inviting in format.

The *Survey* has made a particular contribution to the advancement of economic knowledge through its care and cultivation of this Nation's national accounts. The most useful measure, in my judgment, of the many employed in the formulation of both public and business policy is the gross national product and its derivatives. You and your colleagues in the National Income Unit were instrumental in the formulation and further development of this concept. Subsequently, you steadily advanced the time throttle so that this measure is now available quarterly and will shortly be supplied on a monthly basis. You also pioneered in transforming current dollar measures into more meaningful constant dollar estimates. Through the development of the implicit price index you have provided us with a most useful approximation of movement of the general price level.

A NATIONAL BALANCE SHEET

As in business accounting, so too in national accounting there is need for a balance sheet to assist in understanding and interpreting changes in the operating statement. The lack of a current and continuing set of wealth and balance sheet estimates is perhaps the most serious omission in our current system of economic intelligence. I believe that the *Survey* would be well advised to extend its present limited programs dealing with the measurement and structure of the assets and liabilities of both the private and the public sectors of the economy.

Industry Detail and Coverage

The current wealth estimates relate only to the private sector and are available at a broad level of industry aggregation—total private sector, agriculture, manufacturing, and all others. This precludes their use in many analytical contexts. It would seem feasible, given recent advances in the state of the estimating arts, to undertake the preparation of estimates of capital stocks by the two-digit industry classifications in the private sector or at least in those classifications in which the corporate form dominates. A complementary set of wealth estimates for the public sector, distinguishing between Federal, State, and local governments and by major functions, is equally desirable and feasible.

"Where Owned" and "Where Used"

While the conceptual framework for the wealth estimates must be consistent with that of the other accounts in the national system, this need not preclude the development of

one or more analytically useful variants. Thus for conceptual consistency with the system the wealth estimates would be prepared on a "where owned" basis but for capital productivity or production function analysis, on a "where used" basis. For the latter purpose estimates of capital stocks that include not only government-owned but also privately operated facilities are required, as well as estimates of the capital value of rented facilities.

Integration with Input-Output

Once these estimates have been developed, a useful followthrough would be to introduce the capital stock estimates into the input-output matrix. This, in turn, should make for a significant improvement in whatever validity the input-output matrix has for longterm projection.

Measures of Capacity Utilization

Perhaps of greater importance is the role that capital stock estimates can be made to play in short-term projections, at least to the extent that the stock adjustment principle constitutes a significant independent variable in short-term macroeconomic projections. The relationship of capital stock to output can be the basis of measuring capacity and capacity utilization across the board for manufacturing industries. Such data would provide considerably more information on capacity utilization rates by industry than is now available from the measures developed by the Federal Reserve Board.

Progress in these directions would also take OBE a considerable distance toward the objectives developed in *Measuring the Nation's Wealth*,[1] i.e., official estimates of wealth by type of wealth by industry and sector, and official estimates of national balance sheets by type of asset and sector. The full implementation of the recommendations of that report would fill the major gap and provide a completely integrated set of economic accounts.

New and Replacement Investment

The *Survey* may also wish to explore the adequacy of the existing conceptual framework for expenditures that are currently classified as new capital formation, as distinct from replacement. The Conference Board Economic Forum, in its "Business Outlook, 1971" (pp. 46-48), suggested the need for reexamining the validity of our present concepts in the light of the emphasis now being placed on "investment" destined to heighten the quality of the environment rather than to further the physical quantity of goods and services.

As the *Survey* enters its second half-century, its notable achievements to date warrant high confidence that it will continue to adapt and extend this Nation's system of national accounts, keeping pace with the heightened tempo of economic, social, and cultural change.

[1] National Bureau of Economic Research, *Measuring the Nation's Wealth*, Studies in Income and Wealth 29 (Princeton, N.J.: Princeton University Press, 1964).

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14

RAYMOND W. GOLDSMITH

Toward a National Balance Sheet

In acceding to the editors' invitation to contribute to the fiftieth anniversary issue of *Survey of Current Business*, on which so many of us have depended for so many years, I have been mindful of the old proverb exhorting the cobbler to stick to his last, or at least to one of his several lasts, and therefore shall limit myself to the statistics of the stocks of tangible and financial assets, i.e., to national and sectoral balance sheets and wealth statements. This in itself is a broad and important field and a significant component of the system of national accounts, but from the point of view of the Office of Business Economics and the *Survey* it is only a very small part of their territory.

The development of this field in the U.S., as in several other countries, over the past half-century well illustrates what has become the two-stage paradigm in all main components of the system of national accounts, as well as in some other fields of economic statistics: first, the original development of the conceptual framework and of the initial rough estimates by individual scholars in universities or research institutions; then, after a longer or shorter interval, the takeover of the task of keeping the estimates up to date, of improving them, and of preparing them in greater detail by an agency of the Government.

Thus the estimation of national income and product accounts, first seriously attacked conceptually and statistically within the National Bureau of Economic Research, largely under the direction of Simon Kuznets, during the nineteen twenties, became a regular function of the Department of Commerce, then carried on in its National Income Division under the leadership of Robert R. Nathan, Milton Gilbert, and George Jaszi, and has continued within the Department in periodically expanding and improved form ever since. Similarly, estimates of the balance of payments, first systematically attacked by the Harvard Economic Service in the early twenties, were developed in great detail, beginning in the thirties, within the Department of Commerce. The preparation of input-output tables, the creation of Wassily Leontief in the thirties, became a regular function of OBE in the fifties. The interval between origination of the estimation process and transfer to a Federal agency was probably shortest in the case of the financial flow of funds accounts. Morris Copeland's original study of flows for the period 1935–42, published in 1952, was put on a continuous and expanded basis by the Federal Reserve Board staff almost immediately after Copeland had completed it.

The process has taken longer and is not yet completed—although it may be hoped that it is not far from that stage—in the case of the fifth component, the national balance sheet. While the statistics of financial assets and liabilities for the main sectors and for the Nation became almost from the beginning a part of the Federal Reserve Board's flow of funds accounts—partly because most flows are technically derived as first differences between the stocks at the beginning and at the end of the period—the preparation of estimates for tangible assets and their combination with financial assets and liabilities and net worth to form complete sectoral and national balance sheets within a system of national accounts has not yet become part of the

statistical activities of the Federal Government (except in the case of agriculture [1]), although fairly detailed estimates by academic researchers affiliated with the National Bureau of Economic Research have been available for benchmark dates since the early fifties and on an annual basis, though with long delays, since the early sixties.[2]

OBE CAPITAL STOCK ESTIMATES

OBE entered the field of national wealth estimates, at least as far as published material goes, on a regular basis in late 1962, although it issued two prior studies in the midfifties.[3] The estimates then released were limited, as all estimates published up to this point have been, to the gross and net stock of nonresidential fixed business capital (structures and equipment) including that of nonprofit organizations, and were derived by the perpetual inventory method. This method, developed in the late forties,[4] starts with what are usually annual figures on capital expenditures, the data being needed for n years before the data of the first stock estimate if n is the assumed length of life of the type of structure or equipment for which the estimate is made. It then applies to these series what are regarded as the appropriate rates of retirements and depreciation allowances and as appropriate deflators if the estimates are expressed, as is usually the case, in constant prices of the base period or in current prices of the date for which the estimate is made, rather than in historical (original) costs. In view of the conceptual differences about the appropriate length of life of different types of capital goods, about the form of depreciation and of the retirement distribution to be applied, and about the character of the price indices to be used as deflators of the original capital expenditures, numerous estimates of gross and net capital stock can be defended or will be needed for different analytical purposes.

The perpetual inventory method automatically provides estimates both of gross stock (capital expenditures cumulated over

[1] See the annual issues of *The Balance Sheet of Agriculture* beginning with 1939. The decennial national wealth estimates of the Bureau of the Census going back to 1850 and the 1922 estimates by the Federal Trade Commission may be disregarded here, as they were not designed to fit into a system of national accounts and are by modern standards quite unsatisfactory, notwithstanding their historical value.

[2] See R. W. Goldsmith, *A Study of Saving in the United States*, vol. 3 (Princeton, N.J.: Princeton University Press, 1956); R. W. Goldsmith, *The National Wealth of the United States in the Postwar Period* (Princeton, N.J.: National Bureau of Economic Research, 1962); R. W. Goldsmith, R. E. Lipsey, and M. Mendelson, *Studies in the National Balance Sheet of the United States*, vol. 2 (Princeton, N.J.: National Bureau of Economic Research, 1963) (annual data for 1945 through 1958); and *Institutional Investors and Corporate Stock*, a background report by the National Bureau of Economic Research for the Securities and Exchange Commission's Institutional Investors' Study (1971) (annual data for 1952 through 1968).

[3] G. Jaszi, R. C. Wasson, and L. Grose, "Stocks of Fixed Business Capital in the United States," *Survey of Current Business*, November 1962, pp. 9–18, 28; D. G. Wooden and R. C. Wasson, "Manufacturing Investment since 1929 in Relation to Employment, Output, and Income," *ibid.*, November 1956, pp. 8–20; R. Nassimbene and D. G. Wooden, "Growth of Business Capital Equipment, 1929–53," *ibid.*, December 1954, pp. 18–26.

[4] Probably the first fairly extensive and detailed estimates made by this method, covering the period 1896 to 1946 for six types of structures and two types of equipment, were published in 1951 as no. 14 of Studies in Income and Wealth (R. W. Goldsmith, *A Perpetual Inventory of National Wealth*) and in more detail in 1956 in vol. 3 of the same author's *A Study of Saving in the United States*.

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the assumed length of life and retirements based on that length and the retirement distribution over it) and of net stock (cumulated capital expenditures minus cumulated depreciation allowances). A great advantage of the method is that it is flexible enough to accommodate practically any desired combination of these factors which determine the estimated value of the capital stock—for the same reason the method has a high degree of transparency to users.

First Estimates

It is to the great credit of OBE that it has from the beginning experimented with a large number of possible combinations of length of life, type of depreciation, forms of retirement distribution, and price deflators, and has in its publications shown actual estimates for a reasonable number of combinations of these factors. OBE's first publication was limited to estimates in constant (1958) prices of the gross and net stock of two types of capital goods (structures and equipment); three sectors (farm, manufacturing, and nonfarm industry); two assumptions about length of life (Bulletin F and Bulletin F less 20 percent); two forms of depreciation (straight line and declining balance at twice the rate applicable to straight line); and two sets of deflators for structures (specific deflator and overall GNP deflator). It provided figures only for 1929, 1945, 1949, 1953, 1957, and 1961, although annual data were derived and available internally, along with other alternative tabulations.

Improved Estimates

The next publication, released four years later,[5] represented a great step forward. The estimates based on extended and improved capital expenditure series were now shown for each year from 1925 through 1965 and were presented separately for seven types of structures and for 20 types of equipment. They were provided in constant (1958) prices (two variants) on the basis of five alternative sets of service lives (Bulletin F, Bulletin F plus or minus 15 or 25 percent); for three methods of depreciation (sum of digits in addition to straight line and double-declining balance); and for three different forms of the retirement distribution. Although the estimates for equipment still were given for only three separate sectors, the distinction of structures by type was equivalent to a broad sectoral distribution. In addition to the wealth of dollar figures, an important addition was provided in the form of the mean age of the stock for numerous alternative concepts of each type of structure and equipment. The data published, although showing more than 6,000 estimates, represented only a minute fraction—apparently less than 0.2 percent—of the 3.5 million or so figures provided by the computer operation, which produced 86,000 columns of data, mostly of 41 annual figures each.

GOPO Structures and Equipment

The latest publication of early 1970[6] not only brings the estimates up to date

[5] L. Grose, I. Rottenberg, and R. C. Wasson, "New Estimates of Fixed Business Capital in the United States, 1925–65," *Survey of Current Business*, December 1966 (the tables appeared in the February 1967 issue).

[6] R. C. Wasson, J. C. Musgrave, and C. Harkins, "Alternative Estimates of Fixed Business Capital in the United States, 1925–1968," *Survey of Current Business*, April 1970.

through 1968 but also incorporates some important additions and improvements, particularly the inclusion of Government-owned privately operated (GOPO) structures and equipment, and provides more detail—the number of types of structures having been increased to 10—so that the number of separately shown estimates of nearly 15,000 is well over twice that in the 1966 publication. On the other hand, estimates were provided only in constant (1958) prices, for two alternative lives (Bulletin F and Bulletin F less 15 percent), for only two forms of depreciation (dropping the sum of digits method), and for one retirement distribution. These estimates again represent only a very small fraction of those available internally, which include original and current-cost valuations. Fortunately, however, we are promised in the near future "a volume of several hundred pages" which will include "a detailed statement of methodology."

Residences and Consumer Durables

Although the private business nonresidential structures and equipment which OBE estimates have now covered in such detail provide information on what is probably the crucial component of national wealth, in terms of overall current values they account for only less than one-fourth of that total. OBE, however, has been at work for a substantial period of time on two additional important components of national wealth, residential structures and consumer durables, and it is hoped that these new estimates will be completed and published before long, one hopes during the current year. At that point OBE's estimates will cover one-half of total national wealth, approximately seven-eighths of private reproducible tangible wealth (omitting only inventories and net foreign investment), and about two-thirds of all reproducible tangible wealth. The structures and equipment owned and operated by the government, which amount to approximately one-sixth of total national wealth, will still be missing, as will land, which accounts for nearly one-fourth of the total.

PROGRAM FOR BALANCE SHEETS

In making some recommendations for further work in the field of national wealth and national balance sheets by the Office of Business Economics and other Federal agencies, I shall start from the assumption that the completion of the U.S. system of national accounts by producing, as a regular part of the system, estimates of the stock of tangible and financial assets for the main sectors as well as for the Nation as a whole is desirable and feasible.

These recommendations are neither startling nor new. Indeed, inasmuch as their essence is the development of a set of full national and sectoral balance sheets within a system of national accounts, and hence consistent with the relevant figures in the real and financial flow accounts, particularly the figures for capital expenditures and saving, they only echo recommendations made as far back as 1957 in the report made to the Bureau of the Budget by the National Accounts Review Committee of the National Bureau of

Economic Research.[7] Inasmuch as the recommendations envisage that most of the building blocks for this set of national and sectoral balance sheets be taken from existing bodies of data, or from relatively limited expansions of them, the program should be feasible within a relatively limited period of time—say two to three years—and with a relatively modest additional expenditure of resources for the two main Federal agencies involved, OBE and the Federal Reserve Board.

Government Structures and Equipment

The first obvious step for OBE to take after the completion of the estimates of the stocks of private fixed assets is the parallel estimation of government structures and equipment. There is no specific reason why this job cannot be immediately taken in hand and why it cannot be completed fairly speedily for Federal, State, and local governments. The basic capital expenditure series exist, and OBE has handled at least as difficult conceptual and statistical problems when making its estimates of structures and equipment of GOPO (government-owned privately operated) plants.

Industrial Breakdown

At the same time a breakdown of business structures and equipment into a few broad industrial sectors should be provided. About half a dozen of them (such as manufacturing and mining, public utilities, nonresidential nonfarm real estate, finance, other nonfinancial nonagricultural business, and agriculture) will probably suffice, although all should be further subdivided into their corporate and noncorporate constituents. As a matter of fact the present estimates of OBE come very close to such a breakdown for structures, and it should not be impossible to supplement it by one for equipment.

Valuation of Land

In turning to the estimates of the value of land, for the Nation as a whole as well as for the main sectors, OBE will be on relatively unfamiliar ground and will have to overcome some basic conceptual difficulties about the valuation of land at constant prices. Fortunately, however, estimates of the value of land in current prices have been made for a long period by the Department of Agriculture for farmland, which accounts for about one-fourth of total land value. A relatively good basis for an estimate also exists for residential land, representing another fourth of the total. The main problems thus will be land underlying nonresidential private and public structures.[8] These problems, some of which were explored in detail in *Measuring the Nation's Wealth*,[9] are certainly not beyond OBE's ingenuity if only aggregates for the entire U.S. are needed. Since the perpetual inventory method is not applicable to estimates of land, the estimates might be limited in the beginning to the postwar period or even to the last decade.

Reproducible Tangible Wealth

After having completed the estimates of government structures and equipment and of

[7] See U.S., Congress, Joint Economic Committee, *Hearings before the Subcommittee on Economic Statistics*, 85th Cong., 1st sess., 1958, particularly pp. 156–57.

[8] Grace Milgram, "Estimates of the Value of Land in the United States Held by Various Sectors of the Economy, Annually 1952 to 1968," prepared for the Flow of Funds and Balance Sheet Study, National Bureau of Economic Research, March 1970.

[9] U.S. Congress, Joint Economic Committee, *Measuring the National Wealth*, Wealth Inventory Planning Study of the George Washington University and Conference on Income and Wealth for the Subcommittee on Economic Statistics, December 1964.

land, OBE will be in a position to produce and to keep up to date with only moderate delay annual estimates of reproducible tangible wealth back to 1925, and of total national wealth (including land) at least for the last decade and for some benchmark dates for the preceding thirty years by utilizing its updated estimates of business fixed capital, broken down for about half a dozen major industries, as well as its new estimates of residential structures and consumer durables and existing estimates of inventories and net foreign assets. This will be a major milestone in the development of the U.S. statistical system and its national accounts (though one reached quite a while ago in some other countries, e.g., Norway).

National and Sectoral Balance Sheets

The last step on the way to an integrated, consistent set of national and sectoral balance sheets covering tangible assets, financial assets, liabilities, and net worth will then be relatively simple and brief, but it will require close cooperation, starting immediately, with the Federal Reserve Board, which, presumably, will provide the estimates of financial assets and liabilities. This step will require agreement on the exact definition of the sectors. It will also call, on the part of the Federal Reserve Board, for some expansion and improvement of its figures for financial assets and liabilities, such as (a) the split of the nonfinancial corporate sector into about half a dozen sectors matching those of OBE; (b) the alternative valuation of longterm claims at market price or the nearest approximation to it, in addition to the present valuation at par; (c) the improvement of the estimates of some items where large discrepancies now exist between owner and issuer records, such as trade credit; and (d) the improvement in the estimates of the market value of corporate stock not listed on exchanges.

LONGTERM PLANS

Closing the system of national accounts through a set of annual national and sectoral balance sheets should be regarded as a shortterm goal—planned for a period of approximately three years. When that goal is in sight we may seriously consider the three next steps, namely, (a) the regional breakdown of some, though not of all, of these figures; (b) the breakdown of the household sector into a small number of subsectors defined by wealth, income, socioeconomic status, or whatever may then be regarded as the most relevant and needed breakdowns; and (c) the development of benchmark Census-type data, both to provide controls of the perpetual inventory estimates where such controls are now lacking (primarily for nonindustrial nonfarm real estate) and to supply additional detail.[10] These steps, in contrast to the first six recommendations, will require a great deal of additional primary material. They are therefore a more adequate subject for the *Survey*'s sixtieth anniversary.

[10] The problems of these Census-type estimates have been exhaustively explored in *Measuring the Nation's Wealth.*

R. A. GORDON

15

Looking Forward After Fifty Years

In this fiftieth anniversary issue of the *Survey of Current Business*, I take it that the purpose is not to dwell on the past but to look forward to the future. The future, of course, begins with the present, which is the product of the past. I need not elaborate on the past and present accomplishments of the Office of Business Economics, as revealed in the *Survey* and in other published and unpublished work. OBE has made GNP a household term, and today we can hardly conceive of applied macroeconomic analysis in the absence of the national income accounts, which OBE now presents quarterly and will soon, it is to be hoped, present monthly (at least in abbreviated form). OBE is our official source for detailed data on the balance of payments, for the eagerly awaited surveys of expected plant and equipment expenditures and inventory investment, for the official data on the regional pattern of income, and for the input-output tables which, when first published by the BLS some twenty years ago, were greeted with suspicion and alarm as a socialist threat to private enterprise but have now become essential tools for rational decisionmaking by business and government. This list, of course, could be considerably extended. Since I want to refer to it a bit later, let me mention also OBE's estimates of the stock of business plant and equipment, for which it now has figures going back nearly half a century.

But enough of the past and present. I shall now take the liberty of suggesting some additional programs for OBE and the *Survey*. I believe that some of these are already under way.

NATIONAL INCOME AND RELATED DATA

It would be helpful to have an abbreviated set of national income accounts on a monthly basis, and OBE's efforts in this direction should certainly be encouraged. There are also some areas in which it would be desirable to extend the national income accounts. First of all, we need a complete accounting for both the public and private stock of capital. I have long believed that the national income accounts should differentiate between government spending on current account and government capital expenditures. And these capital expenditures should be cumulated into estimates of the capital stock owned by government—at the Federal, State, and local levels.

OBE has prepared estimates of government-owned but privately operated structures and equipment, and such estimates are essential if we are to study the relations between input and output in the private sector of the economy. But my suggestion for estimates of government investment and government-owned capital stock, of course, go much further, and in due time, we might hope also to have estimates of the stock of privately owned residential buildings and other consumer durable goods. I gather that such estimates are being developed.

Given the rapidly growing interest in the nonmarket aspects of economic activity, it would be useful if OBE were also to plan future work on some of the now unmeasured nonmarket dimensions of an appropriately

broad concept of the national welfare—for example, the value of increasing leisure resulting from a shorter workweek, the imputed value of unpaid housekeeping services and the effect thereon of the changing labor force participation of married women, the costs of environmental deterioration associated with increasing output and urbanization, and so on. Some studies of this sort are now going on outside the Federal Government.[1]

While on the subject of the national accounts, let me say that I welcome OBE's increasing investment in the preparation of input-output tables. If OBE should be able to acquire the resources necessary to prepare such tables annually, I gather that the publication time lag would be reduced by about three years (the 1963 tables were published in 1969). In addition to the preparation of the basic data for the input-output tables, OBE has done a certain amount of analytical research based on those data. Further analysis along these lines is certainly desirable.

OTHER TYPES OF DATA

I can only comment briefly on a few of the other types of data for which OBE is the primary source. The OBE-SEC surveys of actual and planned expenditures on new plant and equipment have proved their worth many times over, but they can be made even more valuable. In view of the relative importance of capital consumption allowances (constituting well over half of gross private domestic fixed investment), could the surveys be designed to reveal more about replacement expenditures—for example, their relationship to investment for expansion, their effect on capacity, etc.? The literature on the determinants of investment all too frequently assumes that replacement expenditures are always a constant fraction of the capital stock. (A recent paper by Robert Eisner[2] is an important exception.) To go on to another point, I wonder if the surveys could be designed to yield more information on the reasons for discrepancies between planned and realized expenditures. We could also use

[1] It is clear that OBE is concerned with this range of issues. After these comments were written, the January 1971 issue of the *Survey* appeared with Edward Denison's provocative article, "Welfare Measurement and the GNP." In a brief introduction to this article, OBE stated that it was "deeply concerned with the subject matter of Mr. Denison's paper" and invited comments which "will help it in the formulation of a realistic and constructive research program" in this area.

On the need generally to redesign the national accounts, reference should be made to the recent very useful volume by Nancy and Richard Ruggles, *The Design of Economic Accounts* (New York: National Bureau of Economic Research, 1970). The Ruggles preface makes clear that OBE cooperated closely with them in the preparation of the volume. See also the authors' references to the recent work of John Kendrick.

[2] "Components of Capital Expenditures: Replacement and Modernization versus Expansion," presented at the Second World Congress of the Econometric Society, Cambridge, England, 1970; see also Robert Eisner and M. I. Nadiri, "Neoclassical Theory of Investment Behavior: A Comment," *Review of Economics and Statistics* 52 (May 1970):216–22; Eisner and Nadiri, "Investment Behavior and Neoclassical Theory," *ibid.*, 50 (August 1968):369–82.

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more special investigations of particular influences operating on business investment. Thus the February 1967 *Survey* carried a special report on the result of the temporary suspension of the investment tax credit and accelerated depreciation allowances; the August 1967 issue contained a very useful report on the impact of monetary tightness in 1966 on business investment.

I am sure that other contributors to this issue who are more competent than I in this area will refer to OBE's significant work in developing detailed data on the U.S. balance of payments, work that began in the early twenties. The quarterly and annual reports on the balance of payments contain an increasing wealth of information on trade and capital movements to and from the U.S.

I should like also to commend OBE for its long and valuable service in providing income data on a State and regional basis. Its recent extension of this work to include income by metropolitan area is very much welcome.

ANALYTICAL STUDIES AND THE *SURVEY*

I suppose it is inevitable that an academic economist should ask for more analytical studies by OBE, to be published in the *Survey* or in such other form as may be appropriate. OBE is to be commended for its invitation to Denison, Griliches, and Jorgenson to use the pages of the *Survey* to debate the sources of economic growth. Another example of a commissioned study is Thurow's econometric model for longterm fiscal policy planning. And the *Survey* has published a number of studies by members of the OBE staff on important topics. But I should like to see more such articles—perhaps one in each issue of the *Survey* which is not largely devoted to regularly scheduled reports and surveys.

Let me cite a few examples. OBE might prepare an occasional article on the state of our knowledge regarding the determinants of plant and equipment expenditures, inventory investment, and residential construction, reviewing the relevant literature and adding the results of its own research in these areas. We badly need further work on the causes of the current and recent inflation in the U.S. and in other advanced countries. Another area that might be pursued further concerns the interrelationships between investment and technical change. And so on.

In this connection, I hope OBE will continue to use input-output tables in its own research, as it has been doing. We need to know more about how changes in the various components of aggregate demand affect the demand for the output of particular industries, how and why input-output coefficients change over time, etc.

I should also welcome further occasional reports on the OBE econometric model. As I recall, the *Survey* has carried only one article on the model. In view of the burgeoning use of such models by business, government, and academic economists, more progress reports on OBE's work in this field would be widely appreciated.

One final suggestion, which I make hesitantly. Could OBE find the time and the *Survey* the space to report occasionally on research conferences, in the results of which its readers would be interested? Some of the U.S. and international conferences on income and wealth might well be reported there. To cite another example, some of the papers presented at the recent conference on econometric price research might have been summarized in the *Survey*. Or, as a final illustration, readers who follow closely OBE's reports on the U.S. balance of payments might be interested in a brief progress report on the international LINK project, which seeks to construct a world trade model.

ROBERT J. GORDON

A Rare Event

16

The occasion of a symposium like this on the work of the Office of Business Economics is a rare event, not only because fifty years is a long time but because economists all too seldom detach themselves from research which depends on Government-generated data to examine critically the organization and methodology of the Government agencies which collect those data. Although most of the comments below are in the form of constructive suggestions for future improvements, let me register at the beginning a strong word of praise for the high overall quality of OBE's accomplishments.

THE INCOME AND PRODUCT ACCOUNTS

Most important, the national income and product accounts effectively serve the needs of shortrun stabilization policy, since they are published with incredible swiftness only a few weeks after the end of the quarter to which they apply, and subsequent revisions general confirm the overall picture of strength or weakness given by the preliminary estimates. Economists and journalists in other highly developed countries envy our NIP and related balance of payments accounts for their timeliness and wealth of detail. Further, OBE engages in a wide variety of other activities which are generally well carried out and are crucial ingredients in a number of areas of economic research, e.g., input-output tables, regional income statistics, and the survey of investment anticipations. Most of OBE's statistical output in these areas is made widely available through articles in the *Survey*, and revisions are made frequently.

THE CAPITAL STOCK STUDY

Updated and Comprehensive Estimates

The Capital Stock Study and related investment estimates are the areas of OBE's operations with which I am most familiar. Since 1967 the *Survey* has published historical estimates of the U.S. private capital stock for each year since 1925, and these estimates have been updated annually to remain consistent with the investment series in the NIP accounts. A great deal of detailed statistical investigation was performed to develop the historical investment series needed to compute perpetual inventory capital estimates beginning as early as 1925. Since the service lifetime of some types of buildings is estimated by OBE to be as long as 60 years, estimates of expenditures on these types of structures had to begin with 1865. Another advance was the development of a "constant cost 2" deflator for structures to replace the deficient structures deflators used in the NIP accounts, which assume that productivity in the construction industry is stationary. Finally, flexible computer programs have been developed which allow the cumulation of constant dollar investment series into a wide variety of capital series for alternative assumptions on service lifetimes and retirement patterns. For the first time, econometricians attempting to study the sources of U.S. growth and to estimate production functions have had a variety of capital estimates at their fingertips and have not been forced to search for appropriate figures in dusty and obsolete old books.

Documentation of Procedures

The Capital Stock Study can, however, be criticized on both procedural and method-

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ological grounds. The compilers of the underlying investment series have not felt obliged to observe even the minimum standards of documentation expected of Ph. D. candidates writing their dissertations, much less the outstanding explanations offered by Goldsmith, Kendrick, and others in the tradition of the National Bureau of Economic Research (which OBE has largely replaced as a collector of statistics on capital). Details which are necessary to appraise the accuracy of the OBE figures can be obtained only in interviews which in some cases elicit vague responses based on half-forgotten worksheets. The absence of detailed published descriptions of procedures serves to conceal decisions which in some cases are highly questionable, e.g., a "convention" in which the deflator for electronic computers is always set at 1.00, despite evidence biased on hedonic regression studies indicating that computer prices per unit of computer services have declined at an annual rate of 15 to 20 percent annually in recent years.

Inherited Data

Another procedural weakness is the absence of any attempt by OBE to investigate methods used by other agencies from which OBE "inherits" data. OBE structures deflators rely partly on indices (developed by the Interstate Commerce Commission and several large private construction contractors) about which virtually nothing is known, in particular, whether productivity change is taken into account and if so, how. Sometimes agencies refuse to divulge how series are constructed; sometimes a rapid turnover in the bureaucratic ranks leaves agencies without any knowledge of the historical series which they are currently publishing. In other cases, OBE and another agency publish investment data for the same series which disagree but for which no reconciliation has been attempted, e.g., historical estimates of investment in tractors, farm machinery, and farm trucks.

The Declining Capital-Output Ratio

The methodological weaknesses of the Capital Stock Study are shared with most previous attempts to estimate capital stocks and are thus understandable. The estimates imply trend rates of growth of capital input which are crucially dependent on very weak equipment and structures deflators. In addition, until 1970 all published estimates implausibly indicated a lower real gross capital stock in 1946 than in 1929, leading to the "mystery" of the dramatic decline in the capital-output ratio between those years [1] which in fact was due largely to (1) huge additions in World War II to the capital stock used by private firms but financed by the Government and thus not included in the privately *owned* capital stock measured by OBE; and (2) a failure to replace old units of capital on a normal schedule of peacetime prosperity, leading to a "stretching" of lifetimes unaccounted for in any of the OBE capital stock variants, which all assume constant lifetimes of a given type of investment good. Further, no attempt has been made to supplement capital stock series with estimates of capital services actually utilized, with the result that econometricians have in most cases assumed 100 percent utilization of capital in time series estimates of production functions and have been forced to rationalize away spuriously puzzling coefficients, which typically show, for instance, increasing returns to labor in the short run.

A RESEARCH BRANCH FOR OBE

Improvements to remedy these weaknesses are difficult to achieve, require hard statistical work, and suggest several needed reforms in the organization of OBE. Since

[1] Robert J. Gordon, "$45 Billion of U.S. Private Investment Has Been Mislaid," *American Economic Review*, June 1969; George Jaszi, "$45 Billion of U.S. Private Investment Has Been Mislaid: Comment," and Reply by Robert J. Gordon, *ibid.*, December 1970.

OBE personnel engaged in the Capital Stock Study have worked in virtually complete isolation from the academic profession, it is not surprising that their work needs improvement. The OBE Capital Stock work has not to my knowledge been the subject of even a small conference attended by academics, nor have the appropriate OBE personnel traveled to universities to give seminars on their work. OBE's isolation contrasts strongly with the close academic ties of the research staff at the Bureau of Labor Statistics, the Federal Reserve Board, and other Federal agencies. The activities of these other agencies suggest that OBE could benefit by a greater attempt to separate its operations into two halves, a "current statistics" branch and a "research" branch, particularly since the pressure of day-to-day estimation responsibilities tends to be the most frequent excuse given to explain the absence of adequate written documentation and academic communication. An additional reform with a potentially high payoff would be an increased effort to hire new Ph.D's. as professional employees and economics graduate students as summer interns to do "grubby" research needed to improve historical estimates.

THE *SURVEY*: FORUM FOR CONTROVERSY

Aside from the Capital Stock Study, numerous other areas in OBE's purview could benefit from an increased research effort, which could lead to the increased use of the pages of the *Survey* as a forum for debate on controversial issues. There are four subjects needing early attention.

A Gross-Gross National Product

Techniques appropriate for the early estimation of a supplementary set of national accounts, to be regularly published and updated, should be developed, based on broader concepts of investment and capital, which would include investment in education, research, training, and other activities as part of a "gross-gross national product," along the lines of the recent exploratory research of Kendrick and the Ruggles. Related to this is the long overdue rearrangement of the basic accounts to separate investment by consumers in automobiles, mobile homes, and college education from "true" consumption purchases like food, gasoline, and theater tickets, with a consequent change in the present meaningless concept of the "personal saving rate" which is presently published.

Subtracting "Bads" from "Goods"

A possible response by national income accountants to the claim by ecologists and others that the real growth of GNP is exaggerated through the failure to subtract the production "bads" like pollution from the production of goods should be investigated. For instance, should the addition of pollution-control devices to automobiles be treated as an increase in quality or as an increase in price? The latter suggestion has apparently gained in popularity recently among those who point to the involuntary nature of such expenditures, ignoring the unmeasured increase in welfare caused by pollution reduction, which, by its nature as a pure public good, must be financed by compulsion. A related question is the possiblity of separating increases in real GNP into "true" welfare-increasing expenditures and expenditure increases on burglar alarms and security guards which simply offset a rise in crime which is unrecorded in the statistics.

The Price of Homeownership

The factors which have caused a considerably faster rise during 1968–70 in the Consumer Price Index than in OBE's deflator

for Personal Consumption Expenditures should be discussed. The discrepancy originates in the differing treatment of the price of homeownership by OBE, which is attempting to measure the price of imputed rent and uses an implausibly sluggish rent index as a proxy, and by the Bureau of Labor Statistics, which constructs a homeownership index which rises with extreme rapidity and thus aggravates the inflationary spiral through the role of the CPI in wage negotiations, even though the index (a) is based on an absolutely secret index of house prices which no outsider has ever seen or discussed; (b) treats all price increases in used houses as pure increases in the cost of living to home purchasers, while totally ignoring the offsetting benefit of capital gains to home sellers; and (c) fails to adjust rising mortgage interest rates either for the vast numbers of homeowners who hold existing mortgages at fixed rates or for the contribution to the interest rate increase of anticipated capital gains by new borrowers.

Survey Data on Economic Questions

Economists are gradually becoming aware of numerous economic questions, e.g., determinants of saving behavior, which cannot be answered by aggregate time series data and for which carefully designed micro survey data are required to achieve real advances in knowledge. OBE is the obvious agency to organize the colection of new survey data; e.g., a continuous panel of consumers and businessmen could be polled on the channels of influence of monetary policy, along the lines of the 1967 survey by Crockett, Friend, and Shavell.

Financing the Forum

In many cases published papers in the *Survey* on these and other topics would involve both OBE staff members and outside academics. There is no reason why some of these outside papers could not be financed by OBE research grants along the lines pursued by numerous other Government agencies; as one example, OBE could probably achieve a considerable improvement in some of its historical series at very low cost by financing doctoral dissertations by graduate students in economic history. By contracting out some of its more difficult and tedious research tasks, OBE would free more of its staff members to maintain and revise series on which the basic research was conducted by outsiders.

A CENTRAL STATISTICAL OFFICE

Issues like the discrepancies between OBE and Department of Agriculture data on farm investment or between OBE and BLS indices of consumer goods prices inevitably lead to the suggestion that existing scattered Federal statistics agencies be gathered in a Central Statistical Office. At present, estimates for important data series are gathered by isolated bureaucrats in separate agencies who pay little attention to one another's work. In my own interviews I have found numerous agency staff members who were unaware of discrepancies between their own statistical series and related ones and who had no idea how differences had arisen, often because historical estimates had been made decades earlier and had been accepted without question by each succeeding generation. The centralization of most Government employees engaged in the gathering of economic statistics into a CSO would facilitate the establishment of a well-financed, progressive research division which would attract more easily the advice, criticism, and participation of academic economists.

ALAN GREENSPAN

OBE and the Business Analyst

17

One can scarcely be involved in business analysis without a thorough familarity with the *Survey of Current Business*, its contents and its ground-breaking studies. In fact, much the same can be said of the work of the Office of Business Economics generally. Rather than comment on the broad range of data creation and analysis which characterizes the work of OBE, I should like to single out certain specific areas where the Office has made major contributions and where further efforts hold promise.

BALANCE OF PAYMENTS

The presentation and interpretation of these data have been particularly outstanding. Over the years, improvements in the detail and quality of the numbers have enhanced our understanding of the payments mechanism. One shortcoming in the system is the relative paucity of information on U.S. direct investments abroad. These form an integral part of the U.S. business structure, yet the quality and sporadicity of the data often frustrate attempts at detailed analysis. It is hoped that the development of sources and uses of funds data for U.S. direct investment affiliates abroad can be updated and expanded. The newly established quarterly surveys of earnings data of U.S. direct investments comparable with the annual surveys will be especially helpful in improving the balance of payments presentation of the direct investment effects. It will also provide one of the ingredients needed to produce, eventually, a quarterly statement of the international investment position of the U.S. Of great value to users of balance of payments data would be a more frequent issuing of a basebook, say, every two or three years. Owing to the substantial revisions in quarterly data, it would be convenient to have the most recent "final" figures in one easily accessible place.

INPUT-OUTPUT

Mainly as a result of OBE's efforts, recent advances in techniques have been quite encouraging. Unfortunately, there has been a tendency to "oversell' the use of input-output in microeconomic analysis. Our knowledge of the dynamic behavior of the input-output coefficients is still primitive and is unlikely to improve measurably in the near future. Hence the immediate payoff in applications is very likely to fall short of expectations, endangering research budgets in this area. Although the major payoff is still many years away, the analytical rewards are potentially so great that curtailment of data collection in this area because of a shortfall of expectations would be most unfortunate.

There are, however, immediate improvements that could enhance the applicability of input-output data to specific industry analysis. First would be the development of matrices

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which show what products each industry makes and what inputs each industry buys, similar to the industry/product and product absorption matrices developed by R. A. Stone for the United Kingdom. This approach can be more meaningfully related to specific industry structures and bypasses the difficulties in working with "transfers" data which the OBE input-output system requires. Second, the development of associated capital flow tables that show purchases by industry of each type of producers' durable equipment and construction would be a very useful appendage to the existing data base. The initial work of the BLS in the area has already proved valuable.

INCOME AND PRODUCT ACCOUNTS

Considering the types of data and estimating procedures involved, what is remarkable about this set of accounts is that they work so well. Additional work is indicated, however: for example, the development of quarterly gross product originating by major industry groups, cross-classified by final demand categories, perhaps tied to a simple consolidated input-output system; inventory change cross-classified by product (at producers' prices), as well as by industry; and regional national income and product accounts, detailing interregional transactions.

CAPITAL INVESTMENT INTENTIONS

This series is one of the very few indispensable inputs in any forecasting model. Major improvements in applications could come from more detailed industry classifications, especially for the nonmanufacturing area, through a separate breakout of plant and motor vehicle purchases.

CAPITAL STOCK

This series has added a critical link to the analysis of capacity, capital productivity, labor productivity, and, indirectly, profits. Aside from further industry detail, periodic reconciliations with actual book value data, as reported by the Internal Revenue Service, would be useful.

STANDARDS OF DATA REFINEMENT

The most encouraging direction in which OBE is moving relates to the broadening of the type of data which it is making available to users, in machine-readable and other forms. OBE has implicitly evolved a certain standard of data accuracy required for publication purposes. This of necessity determines the published level of detail in its numerous series and, secondarily, the speed of dissemination. However, not all users of the data require OBE's level of accuracy and would be willing to accept tradeoffs for more detail and quicker availability. Perhaps OBE should present its less accurate detailed preliminary data in periodic releases, with specific caveats with respect to their degree of accuracy. It is far better for an analyst to have crude data suggesting orders of dimension or direction than no data at all. Certainly, the availability of unpublished data on capital stock, gross product originating, product prices, etc., on computer printouts, tapes, or cards has made a major contribution to economic analysis.

DOUGLAS GREENWALD

The Survey *and the Business Economist*

18

The *Survey of Current Business* and the Office of Business Economics provide an important and ever-improving service to the business, academic, and government communities. However, my comments will relate strictly to my needs as a business economist. OBE generates most of the important data used by business economists in their analysis of the current economic scene as well as in their forecasts and projections of economic activity. The national income and product accounts, the input-output tables, and the international payments accounts provide key frameworks for business forecasters. These three essential sets of data are estimated by OBE experts from a wide array of economic statistics.

INCOME AND PRODUCT ACCOUNTS

During the past three decades, GNP has become a term known to nearly every adult in the U.S. It is conceivable that input-output may supersede GNP in use by economists, but, because of its complex technical aspects, it will not be used by the average businessman to explain the economy.

Over the years, OBE has strengthened estimates of GNP and its components. It has striven to make the data more accurate, more timely, and more useful to users. Only a few years ago it began to release quarterly estimates of real GNP. I hope that it will move in the direction of providing even more timely data. At present, estimates of quarterly GNP are now released about two to two and a half weeks after the close of the quarter. It is my understanding that OBE could provide monthly estimates of real GNP during a quarter, which, in effect, would make available key information on total dollar GNP and real GNP about six weeks earlier than at present.

However, OBE continues to emphasize aggregation of data rather than disaggregation in its GNP estimates. It has stressed the macro approach to the national income and product accounts rather than micro analysis. Perhaps its current work in input-output, with its emphasis on interindustry detail, will help shift its focus toward the micro approach.

SURVEYS OF BUSINESS EXPECTATIONS

For those of us who regularly make quarterly forecasts of GNP and its components, the quarterly survey of anticipated plant and equipment expenditures provided jointly by OBE and SEC is one of the most important tools in our kit. OBE should be praised for finally providing an annual estimate of capital expenditures in December for the succeeding year, and for its detailed industry breakdown of capital investment in its latest comprehensive revision, reported in the January 1970 issue of the *Survey*. But in the case of the capital expenditures survey, as in the case of GNP, more detail would be useful to the economic analyst.

For example, business economists need regional breakdowns of investment expectations, more industrial detail, and a breakdown between expenditures for plant and for equipment. Among new projects, I believe the division of capital investment should get the highest priority. Of course my own department's spring survey of investment plans provides these various breakdowns in order to

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satisfy the needs of individual companies for such data, but OBE could provide us with more accurate benchmarks than we now have.

Although OBE's quarterly survey of inventory expectations has not yet reached the same acceptance level among businessmen as its plant and equipment investment survey, it has clearly taken a step in the right direction, considering the fact that forecasting inventories is still the most difficult area for business forecasters. OBE should continue to expand its efforts in this area.

Another expectations survey carried out by OBE, which business economists working for multinational companies consider important in their analysis of the world business scene, is the semiannual survey of expenditures for property, plant, and equipment by foreign affiliates of U.S. corporations. The results of these surveys are helpful to those of us who regularly attempt to estimate what's happening to our international payments. But here, too, I would like to see OBE present more industrial and regional detail.

INPUT-OUTPUT

OBE's research in the input-output technique and the development of input-output tables has generated considerable interest in this technique but more recently among marketers rather than economists. As we all know, input-output is not a new tool for the economist, but, with its stress on the micro over the macro, it is becoming a useful tool for market researchers. I believe, however, that OBE should continue to stress the dangers of using such tables as a source of precise marketing data. Under present circumstances, we are not likely to see the 1967 tables before 1972, but an effort should be made to prepare them annually. Conceivably this would cut the time lag about in half. Obviously, more current data would be more useful to all marketer-users as well as to economists.

OBE AND THE CENSUS BUREAU

It seems to me that because of the U.S. Census Bureau's expertise in sample surveys OBE has turned over to Census much of the job of data collection relative to current economic statistics. This could prove beneficial if Census and OBE experts were to work more closely together. However, at present it appears that the Census staff lacks the judgmental qualities that can be supplied by OBE's staff. From some of the economic statistics that I see regularly, such as monthly manufacturing shipments, it seems to me that the OBE and Census experts really don't talk to each other about what these data mean in terms of current economic trends.

THE *SURVEY*

I would also like to comment briefly on the appearance and content of the *Survey*. Over the years its appearance has changed significantly, and for the good. It is now far more readable than ever before. Moreover, the articles are now geared more and more to current and future economic developments rather than historical performance. This makes the publication a more valuable source of information for the business economist now than it has ever been. Nevertheless, there is still opportunity for improvement both in format and in content. I believe more emphasis should be placed on future economic developments. Clearer prose should be one of the goals, to make the *Survey* even more readable. Finally, instead of repeating the same set of charts every month, I would like to see the important developments in the economy highlighted through a few charts.

DAVID L. GROVE

Survey *Readers at I.B.M.*

19

The *Survey of Current Business* is a publication that I.B.M. economists use more extensively than any other, consistently providing us with highly readable, well-organized, and insightful material. It has become even more helpful in the past few years by expanding its horizons to encompass a variety of special articles, including studies by outside authorities (e.g., those on productivity by Denison and by Jorgenson and Griliches and a fiscal policy model by Thurow) and alternative calculations of the implicit GNP deflator. As for the Office of Business Economics, it deserves the highest praise for its rigorous standards, the professional competence of its staff, and the invariable cooperation of its members whenever we have had occasion to consult with them. Both the professional economic community and the business community owe a deep debt of gratitude to George Jaszi for his high-principled, dynamic, and outstandingly competent leadership of OBE.

I wonder whether it is generally recognized how much modern business management depends on underlying economic data for its planning and decisionmaking. At I.B.M., for example, economic forecasts based on these data are generated by quarterly and annual econometric models. The forecasts are important inputs in developing projections of business volumes, employee compensation, and plant and equipment requirements. Forecasts of GNP and related variables by industry, which we obtain with our input-output model, are an integral part of I.B.M.'s industry marketing and planning approach. Without the underlying economic data—of sufficient quality, detail, and timeliness—all our modelbuilding activities and much of the related planning process would be virtually impossible. Thus, the following suggestions for data improvement in large measure stem from practical business needs.

THE NATIONAL INCOME ACCOUNTS

Monthly GNP Estimates

The body of economic statistics prepared by our Government has been properly regarded as among the very best in the world in terms of quality and comprehensiveness, largely as a result of OBE's efforts. It is no criticism of OBE, therefore, to say that, notwithstanding this position of leadership, there is considerable room for improvement. Recognizing the budget constraints that presently affect all Government agencies, we urge that especial care be taken by OBE in establishing priorities for new undertakings. In this regard we question the wisdom of the substantial new endeavor to develop estimates of gross national product on a monthly basis. The resulting statistics will most likely have an erratic character which will require more analysis and explanation, will have a far weaker data base (even given the efforts underway to minimize this deficiency), and will entail more problems of seasonal adjustment. In our view, the resources absorbed in this way would be more effectively utilized in improving the accuracy and detail of the presently constituted national income and product accounts.

Breakdown of Government Purchases

Among the NIA sectors, government purchases should be further refined. We should like to see estimates of government capital

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spending, broken down by equipment and structures, allocated to defense, Federal nondefense, and State and local government purchases, and of spending by government enterprises. Quarterly constant dollar data on Federal purchases should be disaggregated into defense and nondefense components. And, indeed, the annual table on purchases by object classification (table 3.11) should also be published in constant dollars, and at least the current dollar figures should be made available quarterly.

Refining the Capital Spending Estimates

In the business spending area, we believe that there is a great need for earlier revision of the quarterly estimates of outlays on producers' durable equipment prior to the July revisions. Because of the timing of the OBE-SEC surveys and the fact that provisional estimates normally hold until the next July, we have for many months "actual" results which in good part are based on plans and are subject to extensive revision. One solution would be to time the surveys two or three weeks earlier to meet OBE's provisional estimate deadlines, but this would involve some seasonal adjustment problems. Perhaps a better course would be to release the provisional estimates two to three weeks later. It also would be desirable to add to the capital spending surveys a question which separates expenditures on equipment from expenditures on plant.

It would be very helpful if OBE would reexamine the procedure for estimating the deflators for private nonresidential fixed investment. These give us concern because they appear to vary considerably from the estimated price increases on plant and equipment outlays reported to McGraw-Hill, after allowance for differences in industry coverage, sampling, and the impact of changing mix on the deflator.

Greater Detail in the PCE Table

In the consumption sector, we believe that the Census Bureau should develop more underlying source data on service components. It would also be useful to have the quarterly table on personal consumption expenditures by type (table 11) published in constant as well as current dollars.

Better Employee Compensation Data

On the income side, theoreticians and model-builders would be grateful for some separation of wages from salaries. Perhaps also we could get an addendum item on compensation for time not worked.

Seasonal Adjustment

Unadjusted data should be published on a current basis—at least for GNP and the major components. Many users would welcome an official description and appraisal of the methods and procedures used to seasonally adjust the national account estimates. The need for such a description and appraisal is even more pressing in light of the new efforts toward constructing monthly GNP estimates.[1]

Methodology

Those of us who are required to forecast would appreciate any help OBE can provide both on techniques it uses in estimating GNP components and on any generally unpublished information about developments materially affecting the current quarter's estimates. An up-to-date methodological sourcebook would be an ideal instrument for accomplishing the first objective. It could, for example, note that the early "change in business inventories" estimates incorporate an expected pattern of upward revision of the preliminary Census data on wholesale trade stocks, and

[1] In a recent paper (delivered at the Annual Meeting of the American Economics Association, Detroit, 1970), Rosanne Cole, a member of our staff, finds that the estimates of quarter-to-quarter changes in GNP are dominated by the method of seasonal adjustment. Estimates based on alternative seasonal adjustment procedures show some considerable disparities from the official estimates of GNP during the past five years.

it should specify in what other sectors this approach is used and the pattern of the expected revisions in the initial data. With regard to the current quarter, we know, for instance, that much of the short-term variation in nondefense Federal purchases is influenced by the erratic behavior of Commodity Credit Corporation sales; it would be helpful if OBE would mention these and other peculiar developments in the earliest possible "Business Situation" articles and explain how they will be treated.

MORE TIMELY INPUT-OUTPUT DATA

Turning to the input-output accounts, we wish to congratulate OBE again for another major contribution. However, in contrast to out views on the NIA data, here we strongly prefer greater periodicity and timeliness of results, even at the expense of less disaggregation. The time span between the reference year and the publication date of the input-output tables is extremely long—six years, in the case of the 1963 results. Moreover, not until 1971 can we expect constant dollar data for the 1963 matrix which can be related to the previous tables and permit more meaningful analysis. The disaggregation to 367 industries, while providing some obvious advantages, may decrease our knowledge of the stability and reliability of the technical coefficients because the finer delineation of industries results in some changes in the allocation of data inconsistencies within the intermediate demand area in the creation of the base table: these rules should be stable over time to permit proper analysis of technological change.

We believe that OBE should be moving in the direction of an annual updating of the input-output tables. This would be desirable even if provided on a much higher degree of industry aggregation than is at present used. In any case, it would be quite helpful to have annual data, historically and in the future, at the current level of aggregation for the bottom and right margins of the table—value added, cost of materials, shipments, and the configuration of final demands.

OTHER SUGGESTIONS

In other areas, we should like to see an evaluation of the manufacturers' inventory expectations survey. To what extent does it help the forecaster? Also, we would be interested in learning more about the OBE econometric model—its predictive performance and the ways in which it has been modified. In addition, it would be useful if the entire body of data in the biennial *Business Statistics* supplement were to be made available in machine-readable form. Prompt availability in this form of the annual mid-year NIA revision, particularly the sizable one scheduled for next July, would also be most helpful to data bank users.

On a different plane, some critics have indicated that the course of our society's well-being has too often been expressed in terms of the national income accounts. Most of us would contend that these are necessary, though far from sufficient, indicators of national progress or retrogression, a point that OBE could stress a bit more in its writings. Certainly the expansion of a variety of social measures, currently in progress, would provide important supplementary insights. With its extensive experience in economic accounting, OBE should help guide the development of a more comprehensive framework of social and environmental accounting.

The fiftieth anniversary of the *Survey* provides a very suitable occasion for economists and businessmen to recognize explicity and publicly how much we all depend on the output of OBE and how fortunate we are that its standards and objectives are so high. These twin considerations are what makes us venture to demand so much more of it for the future.

20

WALTER E. HOADLEY

The Business Economist's Bible

The Office of Business Economics is to be congratulated for its unsurpassed statistical and analytical contribution to understanding the economic activity of the U.S. over the past fifty years. The *Survey of Current Business* continues to be the bible of any practicing business economist interested in the U.S. economy. I commend you for using your fiftieth anniversary to look forward to challenges ahead as well as to evaluate the fine accomplishments of the past.

INTERPRETATION OF OBE DATA

Here are a few suggestions for the future. In my judgment, OBE must strengthen its leadership role not only in the provision of economic data but also in the interpretation of those same data for the business community and the general public. Understandably, the OBE staff works so closely with basic economic information that it is easy at times for the data to become almost an end in themselves. Surveys of investment anticipation and consumer spending plans are definite steps in the right direction. It would be helpful to add to each issue of the *Survey* a three- to six-month outlook analysis for basic indicators of business conditions.

A GROSS SOCIAL PRODUCT

Many people now are coming to recognize that the gross national product concept may have reached the zenith of its usefulness —although this is not to minimize its importance in the future. As a result of the major changes that the American political economy is experiencing, the need to measure our economy's performance in "social and qualitative" terms as well as strictly economic terms is becoming urgent. The development of some measures of gross social production should be high on your priority list of new projects for the future. I envision the day, I hope within this decade, when practicing business economists and forecasters will be able to make some meaningful quantitative comparisons between the rate of inflation, the rate of growth in real GNP, and the rate of social or qualitative progress. Your contribution to the latter measure will be instrumental in helping to shift the emphasis from traditional "growth for growth's sake" to "higher quality of life" objectives required for the future development and guidance of our national economy.

A related problem should also be pointed out. Our present measures of "real" output

are headed for major difficulties, as far as relying on them for making national and international policy decisions is concerned. The focal issues are (1) the relative increase in the service sector of our economy, a sector in which cost-push inflation seems rampant while data on costs as well as output are still rather crude; and (2) the inevitable rise in living costs as now measured because of increased public and private outlays to improve the environment. We face the prospect of making progress against some traditional forms of inflation and yet not getting credit for such improvement at home or abroad because the available data for measuring such progress have little or no comparability with past measures or with those used in other countries, where concern about the integrity of the dollar is a constant subject for economic and political discussion and action.

FOUR-DIGIT INDUSTRY DATA

Econometric techniques for relating industrial input-output analysis to macroeconomic forecasts are increasing rapidly. As a result, there is growing need for data on an industry basis (down to the SIC four-digit basis) that is consistent with the national income accounts data. Some thrust of your future research should provide that consistency.

FIELD EXPERIENCE

As you embark on the next fifty years, may I also encourage you to have your people spend more time in the field. Such field experience will not only be an important key to the success of your emerging interpretive role, but also will enhance your ability to provide useful information and forecasts to Federal policymakers as well as to obtain increased business support across the Nation.

I am well aware of your financial constraints and realize that each suggestion made carries with it the need for some funding unless other programs can be reduced. Support for OBE in the final analysis, of course, will depend upon the assessment of users inside and outside of government. Let me say for the record that Bank of America considers your work to be exceedingly worthwhile for business as well as government.

Walter E. Hoadley is Executive Vice President, Bank of America.

RICHARD H. HOLTON

21

Winning the Budget Dollar for OBE—or Can Statistics Have Sex Appeal?

The Office of Business Economics, with an annual budget of less than $4 million, must surely be of more use directly or indirectly to more people per dollar of budget than almost any other Government agency. Yet OBE is in a continual struggle with Congress for even the very modest amounts needed to maintain and improve its various statistical and analytical programs. Why should an agency whose work is so widely used have such a difficult time in the struggle for the budget dollar?

No doubt part of the problem is that there are few items in the Federal budget which are politically as sexless in the eyes of a Congressman as a new statistical time series or, worse yet, a program to improve the quality of an old one. When compared with new money for an item in the Rivers and Harbors Bill or in HEW appropriations, the idea of spending perhaps $100,000 to expand the plant and equipment survey to include all commercial enterprises is of little appeal. If the Congressman or Senator involved thinks that the Federal Government already has too much information in hand, such an item is likely to have little or no audience in the councils of Congress.

A UNIQUE MARKETING PROBLEM

Buyers and Consumers

The challenge of "selling" OBE programs to the appropriations committees of the Congress can be conceived as a unique problem in marketing. It is unique in several ways. First, the "buyers" or "customers," if we define these as the people who must provide the funds, i.e., the appropriations committees and the House and Senate, are not, for the most part, the major users of the data which would be generated by new appropriations. Of course various data from OBE will be quoted in committee hearings on economic policy problems, and to the extent that Congressmen and Senators use this information they are consumers, but surely the great majority of the users of OBE data are not members of Congress.

The primary consumers of the data are a host of decisionmakers and staff advisers to decisionmakers in the private sector and in the various levels of government throughout the country as well. The OBE data (and this is true of other government-generated data as well) pass through a series of channels of distribution which might be compared with the channels of distribution of physical goods that move from manufacturer to ultimate consumer.

Repackaging the Product

Perhaps the most curious feature of OBE data, however, when one views these as a "consumer good" in some sense, is that they are repackaged in a wide variety of ways as they filter through the "channels of distribution" to the ultimate user. This repackaging goes so far as to remove from the final product any reference to the original producer, namely, OBE.

Business Periodicals

Who are these "repackagers"? One could cite the various business periodicals that interpret economic developments for their clienteles. Foremost among these on a national basis for the total business community might well be the *Wall Street Journal, Business Week, Fortune* magazine, and the financial writers in the daily press. For individual industries and trade associations there are a

host of newspapers and magazines that use OBE data as basic raw material in their reporting of economic developments of interest to their clientele. One can only imagine the impact of such sources of information on the decisionmakers in the total economy.

Anyone familiar with the information generated by OBE can clearly see wheere its data have been used in articles in these various periodicals, but rarely is the source of the data noted. This is not meant as a criticism of the "repackaging" articles. They use information from a variety of sources, and to insist on footnotes or other means of identifying the origin of each number in an article would convert it from easy readability to the turgid prose and intrusive footnoting that one finds in law journals. Good repackaging often virtually *requires* that OBE not be mentioned as the source.

Corporate Staff Reports

But OBE data percolate through to decisionmakers in a variety of other ways as well, without the decisionmakers being aware that they are indebted to OBE. In the course of any given 12-month period there must be thousands of staff reports using OBE data which go to decisionmakers in the hundreds of corporate and government units in the country. One can imagine, and probably with accuracy, that there are countless staff reports within corporations, for example, which have involved the use of OBE data at critical points. But as the information is refined and condensed on its way to the top, the table (if there was a table in the first place) disappears, along with its footnote citing OBE as the source (if there was a footnote in the first place).

The net result of this process is that OBE has no political constituency with any real potency. OBE data figure in countless decisions but the decisionmakers have no way of knowing, without doing some homework, their indebtedness to OBE. An army of staff economists around the country may value greatly the work of OBE, but how much lobbying strength can they mount compared with, for example, the professionals from the defense industry or from a labor group?

Invisible OBE

No doubt another reason for the lack of support for OBE programs stems from the curious lack of visibility OBE enjoys among the collection of satrapies that constitutes the U.S. Department of Commerce. For historical reasons that are by no means clear, newspaper stories will begin, "the Department of State today announced that" or "the Department of Agriculture will soon" or "the Treasury Department plans to," but stories from the Department of Commerce are far more likely to say that "the Census Bureau reports" or "the U.S. Patent Office has granted" or "according to the National Bureau of Standards." Few citizens will recognize that these agencies are really bureaus within the Department of Commerce.

Yet somehow when the estimates of the gross national product or the balance of payments or personal income are announced,

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they are commonly attributed to the "Department of Commerce," and much less frequently to the "Office of Business Economics." Thus OBE has very limited visibility among the general public.

RATE OF RETURN ON OBE'S PRODUCT

Presumably, much could be done to solve this problem if we had some satisfactory means of measuring the value of statistical information and analysis of the sort produced by OBE. How might one measure the benefits associated with any particular OBE program? What would those benefits amount to? If one views the problem in oversimplified terms, it might be argued that we can afford to spend for improved information an amount up to the value of the incremental GNP resulting from that improved information. This puts the problem in its crudest and simplest terms, perhaps, but it gives us some notion of the importance of this service. If better information raises GNP by .001 percent, a trillion-dollar GNP would suggest that we could spend $1 billion on the program. Or if a new program in OBE were to cost $100,000 annually (a program of moderate size, in OBE's experience), GNP would need to increase by only .00001 percent if our measure is incremental GNP relative to incremental costs.

Tracing through the effect of improved information on decisions in the economy as a whole is, of course, an impossible task. Consequently, one is left mumbling to oneself, so to speak, that the OBE programs would seem to be an awfully good buy for the American people. So OBE continues to suffer from lack of a visible constituency, from lack of "image," in the parlance of Madison Avenue, and from our inability to estimate satisfactorily the value of the kind of information it generates. The Federal Statistics Users Conference is a step in the right direction, but it can scarcely expect to develop any real political clout without the heads of a few major corporations and/or trade unions entering the lists for OBE. (And somehow that eventuality boggles the mind.) Perhaps it is in the nature of things that general-purpose economic data have limited appeal to elected representatives, especially if they are dubious about the black art of economic analysis in the first place. But consider the plight of the practitioner of this art if he were robbed of his OBE information! In light of the crucial importance of OBE data for economists in the formulation of business policy, must we practitioners not mount a more successful lobbying effort in support of expanded OBE programs?

DALE W. JORGENSON

Econometric Research and the National Accounts

22

Econometric research in the U.S. relies heavily on the national income and product accounts. Econometric models of the U.S. economy are largely directed toward explaining and predicting national product and income variables. Behavioral equations in these models—consumption function, investment function, profits equation—refer to variables defined as part of the national product or national income accounts.

Detailed studies of industry employment and investment behavior also rely on national accounting data. Investment expenditures and the number of persons engaged are measured by OBE and published together with national accounting data. Explanatory variables such as industry output levels, rates of compensation of labor and capital, and product prices may be taken from breakdowns of national accounting aggregates by industry group.

New and fruitful directions for econometric research are possible within the existing framework of the U.S. national accounts, but many promising lines of research require new accounting data. The purpose of this note is to describe possibilities for econometric research that necessitate extension of the national accounts and their integration with other sources of economic data.

New data on real output and real factor input are needed for the study of production at both aggregate and industry levels. Contemporary theories of household behavior require the integration of income and product data with national wealth accounts. The study of demand for real and financial assets requires integration of income and wealth data with flow of funds accounts. In all three areas of research, data on capital service prices and rates of return must be generated and integrated into the national accounting framework.

REAL PRODUCT AND REAL FACTOR INPUT

Gross national product in real terms and its rates of growth are probably the most widely used national accounting measures. The measurement of real gross national product is standard in national accounting practice. Quantities of output delivered to final demand are measured in as much detail as possible. Individual product measures are aggregated into an overall product measure using prices as weights.

In econometric studies of production functions, data on real product are analyzed together with data on the ultimate factors of production—labor, capital, and land—supplied to the economy. Real factor input is an overall measure of the quantity of these productive factors supplied. It corresponds to the real side of the national income accounts in the same way that real product corresponds to the real side of the national expenditure accounts.

Conceptually, the problems of measuring real factor input are similar to those of measuring real product. Quantities of individual factor inputs are measured in as much

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detail as possible. Individual factor measures are aggregated into an overall factor input measure using factor service prices as weights. Despite similarities between real product and real factor input measures, real factor input and its components have yet to be incorporated into the U.S. national income and product accounts.

The main difficulties in measuring real factor input are practical rather than conceptual. Just as individual products are aggregated into an overall product measure using prices as weights, individual labor inputs may be aggregated into a labor input measure using labor compensation rates as weights. To complete the measurement of real factor input, capital compensation rates are required as weights for individual capital inputs.

Labor compensation rates correspond to wage rates adjusted to incorporate other labor costs such as benefits and payroll taxes. Capital compensation rates correspond to rental rates, adjusted to incorporate capital costs such as depreciation and property taxes. For most capital inputs this involves an indirect imputation of rental values from data on profits, interest, depreciation, and taxes paid. An imputation of this type is already carried out for owner-occupied housing in the U.S. national accounts.

Imputation of rental values for all capital inputs requires data on property income, including depreciation and both direct and indirect taxes paid, as statistical raw material. Data needed for perpetual inventory estimates of capital stocks are also required for imputation of rental values of capital input. A comprehensive aggregate measure of real capital input and real factor input has been constructed along these lines by Christensen and myself for the period 1929–1967 for the U.S. private domestic economy.

The first step in imputation of rental values is to construct data on capital stocks in current and constant prices. The implied estimates of economic depreciation are then combined with information on rates of return and the tax structure imputed from data on property income. The result is a measure of the rental value of each capital input, including the real rate of return, the rate of economic depreciation, the rate of taxation, and the value of the asset—all adjusted for the effects of the tax structure.

NATIONAL WEALTH

Contemporary theories of consumer behavior emphasize the intertemporal character of consumption and saving decisions. The household selects a pattern of consumption which is constrained by its total wealth and which depends on the present and expected future prices of consumption goods. In the simplest theory of this type consumption depends only on the present price of consumption goods and the initial wealth of the household.

No measure of national wealth is currently available as part of the U.S. national accounts. From a conceptual point of view national wealth occurs as part of a national

balance sheet, while national income occurs in a national income statement. The link between the two is found in saving and investment accounts. Period-to-period changes in the current value of national wealth are equal to saving net of economic depreciation plus revaluation of existing assets.

Gross private national saving, as defined in the U.S. national income and product accounts, provides the basis for estimation of period-to-period changes in national wealth. Economic depreciation of existing assets must be estimated to obtain net saving. In the present national income accounts economic depreciation is estimated mainly from depreciation allowances for tax purposes. Estimates of economic depreciation from perpetual inventory estimates of capital stock would be more appropriate for the measurement of saving and for wealth accounting.

Estimates of saving must be combined with estimates of the revaluation of existing assets for the measurement of national wealth. Revaluations are required as part of the imputation of rental values for capital inputs. The data needed for perpetual inventory estimates of capital stocks are sufficient to link income and expenditure accounts with national wealth accounts. Accordingly, the highest priority should be given to compilation of a comprehensive set of perpetual inventory estimates of stocks of tangible assets, including depreciable assets and inventories, for the U.S. private domestic economy.

Private national wealth includes the tangible assets of the private domestic sector together with net claims on government and on foreigners. Data on net claims consistent with the national income accounts are available from the flow of funds accounts compiled by the Board of Governors of the Federal Reserve System. The main obstacle to incorporation of national wealth in the U.S. national accounting framework is the compilation of data on tangible assets.

RATES OF RETURN

Consumption decisions may depend on rates of return as well as on initial wealth and the current price of consumption goods. The relevant rate of return is the rate of return after taxes on all of national wealth. Imputation of this rate of return begins with flow of property income gross of depreciation and taxes. This flow must be reduced by economic depreciation and both direct and indirect taxes to obtain a rate of return relevant to consumption decisions.

The econometric study of production and consumption decisions is a well-established area of research. Economic theories of production and consumption can be implemented at least in part by means of available national accounting data. The third area of basic research on economic behavior is the study of portfolio choice. The study of portfolio decisions is much less well established in econometric practice. The analysis of these decisions requires new accounting data on rates of return on components of the national portfolio.

Rates of return enter into the study of production through the service price of capital input. The real rate of return is one component of the service price. The others include economic depreciation and the tax structure. Rates of return enter the study of consumption through the relative price of present and future consumption goods. The relevant rate of return excludes both business and personal

taxes, while the rate of return relevant to production decisions excludes only business taxes.

The study of portfolio decisions requires data on portfolio composition for the U.S. national economy and for individual sectors of the economy. These data are already available from the flow of funds accounts except for satisfactory measures of stocks of tangible assets. The economic theory of portfolio choice as developed by Markowitz emphasizes the role of nominal rates of return in the determination of portfolio composition. Data on nominal rates of return for broad classes of assets are unavailable, so that empirical studies of portfolio choice remain a virtually unwritten chapter in econometric research.

The measurement of rates of return requires integration of income and wealth accounts at a more fundamental level than that required for the measurement of saving. Flows of property income must be decomposed into depreciation, taxes, capital gains, and nominal rates of return. Separate flows of property income are required for each class of assets—tangible assets and financial claims of various types—in order to measure separate rates of return.

Flows of property income for incorporation into national income accounts exclude capital gains whether realized or not. Capital gains on an accrual basis are required for the measurement of nominal rates of return. The selection of an optimal portfolio requires data on nominal rates of return for each asset in the portfolio. Capital gains on an accrual basis are required for the revaluation of assets in measuring period-to-period changes in national wealth.

CONCLUSION

National accounting data have provided an important stimulus for econometric research at both aggregate and industry levels. The absence of appropriate accounting data is a crippling impediment to progress in econometric research, as can be illustrated equally well by studies of the demand for capital input in production, of the effects of the rate of return on consumption, or of the analysis of portfolio decisions.

In econometric research thus far, new accounting data have been quickly exploited as they became available. The econometric research of the future will require a very substantial extension of the existing national accounting framework. Measures of national wealth and the associated rate of return must be incorporated into that framework. Breakdowns of real and nominal wealth and real and nominal rates of return by economic sector and by class of asset will be required.

JOHN W. KENDRICK

The National Accounts: The Heart of OBE's Statistical Program

23

What would happen to the state of economic analysis if the statistical programs of the Office of Business Economics were suddenly abolished? To ask this question is to underscore the significance of the programs developed by OBE over recent decades. It is obvious that basic economic research, current business analysis, forecasting, and the public and private policy decisions that depend on sound economic statistics and analysis would all suffer greatly. It is equally true, however, that there is still large potential for further constructive evolution of OBE's programs in directions which can significantly strengthen economic analysis.

In the following remarks, I shall confine myself to the national accounts, which are the heart of OBE's statistical program, as I view it. Following the initial report on national income in 1934, the development of income and product accounts in 1942 and of the interrelated sector accounts in 1947 placed the U.S. in the forefront of pioneering work in the field. Its great importance was in the creation of reasonably reliable estimates, based largely on existing data, within an economic accounting framework ensuring completeness and consistency and structured for usefulness in analysis and policy formulation. Further, the structure is capable of elaboration, deconsolidation, and supplementation in a variety of additional directions.

Subsequent refinements and elaboration by OBE of the production account have been of great utility to economists. In particular, the preparation of estimates of GNP in constant prices in 1951; of income and product originating by industry in current and constant prices in 1962; and the deconsolidation of product by industry into an interindustry sales and purchase (input-output) matrix in 1964 were major steps forward.

SAVING, INVESTMENT, AND WEALTH

In contrast to the progress realized with respect to the production account, however, there has been a lag in refinement and elaboration of the sector income and outlay ("appropriation"), and associated capital accounts.

Sector Saving-Investment Accounts

First of all, I believe it would be desirable if the concepts and measures of investment were expanded and the saving-investment account deconsolidated by sector. The expansion would involve the reclassification as investment of new construction and purchases of durable goods, and (if feasible) inventory accumulation, by the nonbusiness sectors. Possibly also intangible outlays, by all sectors, designed to enhance future income- and outlay-producing capacity, notably research and development, and education and training expenditures should be classified as investment. The resulting recognition of nonbusiness investment would logically result in the imputation of rentals on the resulting capital stocks as part of current outlays of the household, private nonprofit institutions, and government sectors.

Balance Sheets

The sector saving-investment accounts could then be integrated with the capital finance (flow of funds) accounts in order to

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explain the sources and uses of funds. Addition of a capital revaluation account would then permit reconciliation of the flows contained in the capital account with changes in end of period balance sheets, by sector and in combination for the Nation. Consolidation of the sector balance sheets yields, of course, estimates of the net national worth, or "wealth," comprising domestic tangible assets plus net foreign claims.[1]

OBE has made important progress towards estimates of national wealth. Not only has it published estimates of the stock of nonresidential structures and equipment in the private domestic economy but it has estimates of the stocks of consumer durable goods and residential structures in the works. The chief remaining gaps would be filled by estimates of government structures and equipment, inventories, and land. It is to be hoped that complete capital accounts, balance sheets, and wealth statements can be completed before the end of the present decade.[2]

NONMARKET ACTIVITIES

My other chief suggestions with regard to the national income accounts are that they be expanded to include additional imputations for nonmarket economic activities and be further deconsolidated or supplemented to include more socioeconomic information—at least on an annual basis. I have already suggested the desirability of including imputed rental values of nonbusiness durable assets; additional imputations for nonmarket labor activity should include the value of services of housewives and other unpaid household work, volunteer activities outside the household, and schoolwork by students of working age. Deconsolidation of the household account, by various socioeconomic characteristics, in particular, would add much to our social information system. Whether or not additional social data and indicators should be grafted onto the economic accounts or developed as a separate system remains to be determined.

In conclusion, it is apparent that there is a large agenda of possible future work for OBE. It is to be hoped that in addition to maintaining its large volume of current work OBE can be provided with resources for expansion and improvement of the Nation's economic accounts in future years. In view of the large payoff to society, I predict that this will happen, and that the content of the *Survey* will change as much in the next fifty years as it has in its first half-century.

[1] For a full exposition of an integrated system of economic accounts, see John W. Kendrick, *Economic Accounts and Their Uses* (New York: McGraw-Hill Book Co., forthcoming); see also Nancy and Richard Ruggles, *The Design of Economic Accounts*, National Bureau of Economic Research General Series 89 (New York: Columbia University Press, 1970).

[2] This objective has been recommended by the Economic Statistics Subcommittee of the Joint Economic Committee; see National Bureau of Economic Research, *Measuring the Nation's Wealth*, Studies in Income and Wealth 29 (Princeton, N.J.: Princeton University Press, 1964).

C. P. KINDLEBERGER

Balance of Payments: Theory and Statistics

24

It is frequently claimed that the happiest countries are those which have no balance of payments statistics. Charles Carter has made a more general statement in a chapter entitled "Too Many Statistics" in his book on wealth.[1] The thought is universally recognized as ironic. The choice of whether to have statistics in general or balance of payments statistics in particular is not open to us because, unlike Switzerland, we lack bankers who defend (for reasons of their own) the secrecy of the countinghouse. Our only option is to decide what kind of statistics we are to have. Here OBE comes close to the utopian ideal of none by providing so many that all but the hardiest analysts are overwhelmed. Happily or unhappily, such hardy analysts, including those in OBE, are legion, and stand ready to digest and interpret. That effort points to complex and unresolved questions that have to do with the need for, and proper role of, balance of payments theory in the preparation of balance of payments statistics.

Before this central theme of this short note is aired, it should be stated that OBE's balance of payments work deserves high marks for completeness of coverage, fullness of explanation, and frankness of revelation. On the last score, in particular, OBE is to be commended for listing in recent years "Special Financial Transactions" of the Treasury and other bodies designed to obfuscate the balance of payments statistics. These transactions are undertaken to present the balance of payments in a rosy light, e.g., by issuing special instruments with a maturity of 366 days (367 in leap years) which are classified as longterm and therefore are entered "above the line," rather than instruments with a 365-day maturity, which would make them "liquid," place them "below the line," and therefore make them part of the balance of payments deficit, according to the "liquidity" definition used by OBE. Statisticians must serve the truth, and OBE's record in balance of payments statistics is one of truth-serving.

THEORY AND STATISTICS

The preparation of statistics abounds in dilemmas: whether to maintain definitions of the series for the sake of continuity and comparability or to alter them to conform more closely with the underlying structural changes, whether to organize commodity classifications solely in terms of the nature of the products classified or to take into account also the nature of the technologies that are used in their production, whether to aggregate or to disaggregate, whether to net or to present the gross data, etc. However, by far the most agonizing dilemma is the

[1] *Wealth* (New York: Basic Books, 1968).

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choice of an underlying theory for organizing the statistics. A balance of payments statement organized from the point of view of an input-output table differs from one constructed along national income lines or with sources and uses of funds statements in mind. The differences are often significant. If this is so, it is of crucial importance how the theory is chosen.

"Autonomous" and "Induced" Items

A look at history will indicate the kaleidoscopic shifts in statistical presentation that have occurred in the past as the result of the disequilibrium in balance of payments theory. According to Taussig and his followers, international transactions should be divided into "autonomous" items, which go "above the line," and "induced" items, which go below it. This view is a dubious one, in my opinion. In general equilibrium, all items determine all items like balls in a bowl, in Marshall's example. Worse, each item—exports, imports, services, capital movements, etc.—can be said to be composed of autonomous and induced portions. Econometricians of great courage may even attempt to sort out the autonomous and induced portions of such an item as imports,[2] but even if they are successful it is not likely that their labors will provide the foundation for a statistical classification.

Liquidity and "Official" Concepts

Prior to World War II the Department of Commerce did not draw a line at all. Next, it adopted a balance based on Taussig's concept. Gradually, during the fifties, and especially after 1958, it shifted to the liquidity concept, in which, broadly speaking, U.S. short-term capital was put above the line and foreign capital (largely made up of changes in dollar liabilities of the U.S.) below. This concept did not rely on the distinction between autonomous and induced transactions. Mounting dissatisfaction with this concept, originating with Triffin, Lary, and Gardner, led in due course to the appointment by President Kennedy of the Bernstein committee. This committee recommended the replacement of the liquidity definition by the "official reserve transactions" definition, which I regard as a slight variation on the liquidity concept. It separates foreign balances into private balances and those of the monetary authorities, the former being placed above and the latter below the line. The new definition turned out to be no more satisfactory as an interpretation of the unfolding balance of payments experience of the sixties than had the liquidity concept.

[2] See Terrance R. Colvin, "A Closed Model of the U.S. Balance of Payments," Ph. D. diss., Massachusetts Institute of Technology, 1969.

Rumor has it that one of the leading OBE figures in balance of payments work resisted the recommendation which would have replaced the liquidity definition by the balance on official transactions and that he was prepared to resign if it were forced upon OBE. If this be accurate, one can only applaud the courage that gave rise to the stand. Happily, a compromise was reached whereby both estimates are given in official publications. Unhappily, the episode does not settle the question of the proper relation of balance of payments theory and statistics, nor does it help in distinguishing between good theory and bad theory.

Pitfalls of Faulty Definitions

This tour through the quicksand of balance of payments definitions is not as humorous as it might seem. Wrong balance of payments definitions are dangerous. A recent study reconstituting the balance of payments of Britain from 1900 to 1913 has shown that London was accumulating short-term liabilities to the rest of the world continuously during that period.[3] On the liquidity definition of the balance of payments, Britain was in perpetual deficit. With the aid of the definition, the writer interprets the statistics as evidence that a rapid decline in British economic vitality was underway. Such an interpretation is possible, although the conventional view, and in my judgment the correct one, is that, despite the decline in productivity in Britain beginning in the last quarter of the century, her international financial position prior to World War II was one of great strength. Thus the liquidity analysis converts strength into weakness.

"ROLLING YOUR OWN" DEFICIT

I have no final answer to the question which I raise in this note. The statistics must be presented in some order, to be sure. But since there is doubt in the minds of many whose opinions are entitled to consideration, there is a great deal to be said for choosing as uncommitted a manner of presentation as possible and permitting the user of the data to roll his own definition of the "deficit." Political leaders and journalists will be discontent and will insist that the statisticians tell them what the deficit really is. They will demand a single number and will not be satisfied with alternatives. Courage will be necessary to resist this demand, the kind of courage which the OBE balance of payments staff has displayed in the past. It is to be hoped that it will continue to display it in the future, but not in the service of defending an indefensible theory.

[3] Peter H. Lindert, *Key Currencies and Gold, 1900–1913*, Studies in International Finance 24 (Princeton, N.J.: Princeton University, International Finance Section, 1969).

LAWRENCE R. KLEIN

25

The Survey: *Lifeblood of the Quantitative Economist*

The work of the Office of Business Economics and its publication in the *Survey of Current Business* have been the lifeblood of thousands of quantitative economists for several decades. From my undergraduate days as an aspiring econometrician up to the present, I have relied on the *Survey* and other compilations of OBE work. There is scarcely a day when I do not find it necessary to refer to the *Survey*, either to the latest issue or to some historical numbers. It is correct to say that the *Survey*, as amplified by interpretations from within OBE, is a way of life for me. Over the three decades in which I have been using it, its coverage has been greatly improved and expanded. It was always good, but it always became better. As an intensive user, then, I am pleased with the *Survey*. However, there are some plausible new directions in which it might move.

NEW DIRECTIONS

Modernized Distribution of Data

Karl Fox suggested, a few years ago, that the *Survey* be taped. This would involve a complete historical updating, with the latest new numbers and all back revisions of series being made available on a monthly tape to which users could subscribe. It could be a kind of data bank, not necessarily on a time-sharing basis but on a distribution basis, the distribution being made in the form of tape as well as in the usual form of periodical publication. Taping the *Survey* would be only a first step in the preparation of a national data storage and distribution system. After the system had been worked out and perfected, OBE ought to attempt to establish a full-fledged, time-shared data system, easily accessible by telephone and complete with various software packages useful in quantitative economic research. Software programs should include seasonal adjustment of data; methods of re-basing, splicing, and interpolating time series; and various regression-type programs.

Measures of Error in Data Series

The builders of economic data series know better than almost anyone else the approximations that must be made and all the possible inroads of error in published series, but the quantitative economist can usually do nothing more than accept official data at its face value. The user of official data ought to be provided with some guides to the relative precision of those data and to the error sources he should guard against. This is especially important in regard to the various entries in the national income and product accounts. Recently, the movements in the statistical discrepancy have been large, so that the "true" direction of change in the most important aggregates is obscured. More information on the degrees of reliability of various entries on the income and expenditure sides of the national accounts would be extremely helpful to the professional user.

Publication of Reconciliation Tables

Many of the concepts used in the work of OBE and published in the *Survey* are subtle economic ideas. They often differ from official accounting records. Major examples are government budgets (administrative, cash, and national income), balance of international

trade and payments, saving, and corporate earnings. In as many cases as possible, there should be regular reconciliation tables to show the relationship between the standard accounting statements and the economists' concepts used in the national income and product accounts.

Expanded International Information

The *Survey* is not without its international sections, yet I feel that international information on a broad scale is lacking. The quantitative researchers must use documents of the U.N., the I.M.F., the O.E.C.D., and foreign governments in order to get a comprehensive view of the world economy. Not only should there be more data on U.S. trade and international payments, but there should also be more data on foreign economic performance. In *Business Conditions Digest* there are a few interesting tables and charts on industrial production and prices in selected countries. The coverage of data series and geographical area should be greatly expanded and presented in the *Survey*.

More Quantitative Economic Analyses

The great majority of *Survey* articles are descriptive, dealing with preparation of data or presentation of standardized series repetitively. There should be more quantitative economic studies that use OBE data. Previous studies on econometric modelbuilding and estimation of specific economic relationships have been quite successful as a means of bringing new ideas developed within OBE before the general reading public. There should be much more of this in the *Survey*.

SOME RELATIVE WEAKNESSES

The *Survey* deserves very high marks, yet there are areas of potential improvement. To some extent, the correction of these deficiencies would represent new directions, but for the most part what is required is improved treatment of data already published in the *Survey*.

Foreign Trade Quantity-Price Series

Among the series now published in the *Survey* on international trade, there are some value figures and some quantity indices. Consistent price-quantity-value series for Standard International Trade Classification categories are urgently needed. The preparation of these for publication in the *Survey* would require fresh research efforts by OBE, but the results would be quite rewarding. The present series published are inadequate for estimating both price and quantity data in trade.

Integration of Flow of Funds Data

OBE has gone far in providing full integration of input-output data with national income and product account data. The intermediate and final accounting systems are very well linked together for selected years. Economic analysts might want this linkage to be more frequent, even if on an aggregated input-output basis, but the next step has not been taken, namely, an integration of the Federal Reserve's flow of funds data with the national income and product ac-

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counts. This form of integration is important work that OBE should take up for regular release in the *Survey*.

Description of Index Construction

Many of the most important national indices are regularly published in the *Survey*, and some of these are constructed by OBE. Others are constructed in specialized agencies. The *Survey* ought to be more self-contained, i.e., it should publish many details on the construction of the wholesale price index, the consumer price index, the industrial production index, and others. The methods of sampling, index weighting, formula evaluation, and other details of index construction should be fully explained from time to time in the *Survey*. As a minimum, weights for separate components in aggregative indices should be regularly published in the blue pages section.

More Local Statistics

Just as international data are underrepresented in the *Survey*, so are local data (I refer to data for State and local areas) in short supply. The data on State personal income payments are of extreme value, but regular statistics on bank debits, local prices, local sales, local employment, and other area-type series would be of extreme value to research workers in regional economics. Many such data exist, and it would seem worthwhile for OBE to gather them together for presentation in the *Survey*.

FUTURE RESEARCH AT OBE

Apart from publication of materials in the *Survey*, the research at OBE has made an independent contribution to economics. This research effort is so vast that it is not easy for one person to comment on it as a whole. The work in econometric modelbuilding and input-output analysis interests me most. During the last decade, research in these two areas in OBE was put on a firm foundation. It would seem appropriate now to see greater effort in modelbuilding, particularly by combining a macroeconometric and an input-output model into one larger system. The feasibility of this kind of system can be demonstrated, and research can be pushed ahead rapidly if access to detailed data is relatively easy. There is no place where the data are more readily available than at OBE. New staffing would be required for such a project, but the information gain would certainly justify the magnitude of the effort. In addition to attempting to model a large, fused system, there should be expanded work on the input-output and the macroeconometric projects now underway within OBE.

JAMES W. KNOWLES

26

Birthday Greetings from a Grateful User

To many celebrating the fiftieth anniversary of the *Survey of Current Business*, the occasion will seem appropriate for review of the editorial successes and failures of the publication itself; attention is altogether too easily concentrated on the publishing end of the business at such times. But what makes the *Survey* unique is the organization and technical personnel that the Department of Commerce has been so fortunate in assembling and keeping together over the last half-century. Were it not for the professional competence and dedication of the Department's data-gathering and economic analysis teams, the publication's birthday would not be worth noting. Instead, the *Survey* has been one of the Nation's most frequently used and most highly respected sources of economic information and analysis.

On this occasion, those of us who use the publication take occasion not merely to express our gratitude for what the Office of Business Economics and the Bureau of the Census have done over the years for the profession but also the hope that the same professional competence and dedication will make the next half-century one of outstanding service of this publication to economists in government, business, labor, and the universities, as well as to a host of nonprofessional readers.

THE *SURVEY*'S ACHIEVEMENTS

Compiling and Explaining the Data

Before commenting on directions which some of us would hope that OBE would take in raising the usefulness of the *Survey* in the future, it is well to look back at what has been done. First, and foremost, through the *Survey*, users have been provided with the vast, constantly growing, and continually refined collection of data necessary to understand the structure and functioning of the American economy and its relation to those of other countries. Indeed, the first issues of the *Survey* were just that— compilations of data presented in a standard format. Some commentary was added later, together with a weekly supplement and various annual supplements, but still a basic purpose of the magazine is the provision of data in easily accessible form, Unfortunately, for most users the data are not self-explanatory, and so the Department very early in the game undertook to provide in the monthly issues and annual supplements commentary to enable users to choose data most appropriate for their own particular purposes.

From the early thirties on, what is now the Office of Business Economics began to be a vehicle for the Department's work in the construction of integrated secondary statistics, the best known of which are the national income and product accounts and the inter-industry tables. Rarely does an economic

The views expressed here are my personal ones and in no way reflect the position of the Joint Economic Committee of Congress or its staff.

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policy debate take place without some or all of the participants making use of these basic bodies of data. As a result of the efforts of OBE, the *Survey* came to be a standard source of studies of high professional quality concerning the structure of the economy. These studies have expanded and improved in quality as a result of the availability of bodies of consistent information such as the national income accounts and the input-output data.

Forecasting Tools

From the beginning it was recognized that the prime purpose of information is to help business and government properly formulate policies on the basis of informed estimates not merely of the current status of the economy but of where it is going. Indeed, this desire to be of service to both public and private policymakers so dominated the thinking behind the *Survey* and the technical work which it reflected as to lead its editors at times, along with the rest of humanity, to overoptimism as to what such efforts could achieve. For example, the December 1929 issue of the *Survey* (No. 100) included these words: "While it may be too early to say that the utilization of business data has entirely eliminated the business cycle, there is agreement today among business leaders everywhere that the wider use of facts will mitigate in a large degree many of the disastrous effects of the one-time recurrent business cycle."

If, like the rest of us, the editors were too sanguine at times about achievements in policymaking, those behind the *Survey* had the right idea. Public and private policies are soundest when they are based on a clear understanding of where the economy is going under current policies. OBE and the *Survey* pioneered in what are called foreshadowing statistics, including what is perhaps OBE's most valuable contribution, the survey of investment intentions, developed after World War II. Long before this, however, OBE was developing and using such a forecasting series as new orders.

In recent decades OBE has expanded into construction of econometric models and other analytical devices that might help public and private policymakers make better use of the bodies of information supplied through the *Survey* and its adjuncts.

SOME HOPES FOR THE FUTURE

Data Integration and Forecasting Aids

As a user of the *Survey* and the professional talents that lie back of it, I hope that the next fifty years will be as innovative as the last fifty. I am sure others will suggest improvements that are needed in the present bodies of data to make them more complete, consistent, and timely. I would only add that to those who advise public and private policymakers, the most significant priorities for data improvement are increasing the integration of the various bodies of data so they can

be used together easily and consistently and elaboration of the foreshadowing measures. Perhaps the area in which foreshadowing data are most needed is in the financial operations of the economy. It should be possible for us to have a better grasp of what current developments mean for the future in the area of finance in the same way in which various tools help us now in the fields of investment and consumption.

Effects of Monetary and Fiscal Policies

But beyond mere data collection, a foremost need is for analytical work that would provide a basis for advising decisionmakers as to the future consequences of present policies and the effects of various suggested alternatives to those policies. Many have tried to create models to tell us what effect the Government budget will have on the economy. Others have attempted to do the same thing for monetary policies. A most obvious fact of economic life is that monetary and fiscal policies are not independent. How do they interact and what effect do they jointly have on the future course of the economy? How can we even measure these policies appropriately so that we can study such effects? OBE has made many studies of the structure of the economy in the areas of consumption, investment, and growth. It will have ample opportunities to continue this work over the decades ahead.

Measuring Potential Output

I hope the editors will pardon me if I suggest that perhaps one of the most valuable contributions OBE and the *Survey* could make to economic understanding is to carry forward the work which we on the staff of the Joint Economic Committee began years ago when we measured the Nation's potential output and then used this concept and its measurement as a means of distinguishing between cyclical and secular forces in the economy. I am convinced that down this road lies our best hope of finding stable and accurate econometric models of consumer and investment behavior. It would not be out of line with the Marshallian tradition to expect that it might also provide us with a key to a more complete understanding of the interrelationships of wages, rates of capital, returns, prices, and utilization of resources which are at the heart of contemporary policy debate.

As a user, I am deeply grateful to the Department of Commerce and, more particularly, to OBE for many contributions that have made my life as an economic adviser and statistician easier and more fruitful. I still hope that their future work, along with the similarly dedicated efforts of other Government statistical and economic research organizations, can make major contributions to the realization of the goal the *Survey* expressed in that 1929 issue, expressed more firmly and completely in section 2 of the Employment Act of 1946—what most would call today the achievement of steady economic growth with full employment and stable prices in a just and peaceful society.

27

SIMON KUZNETS

The Penalties of Success

My main interest is in the estimates of national income and product and the various related series on regional income, size distribution of income, capital stocks, and the like; and I value the *Survey* largely for its detailed reporting of the results of OBE work on these topics. The contribution of this work to our knowledge of the quantitative framework of the Nation's economy and of its changes over a period of more than four decades (and longer for some less detailed series) can hardly be overestimated—although it is not widely and fully appreciated. Additions to our stock of knowledge that are widely accepted become integral parts of the fabric of daily life and work, and we find it difficult to picture the situation before such knowledge was available to us, when our perception of the economy and its changes was much vaguer and more fragmentary.

EXPANDING THE NATIONAL ACCOUNTS

Two aspects of the OBE work in the field should be stressed. First, the scope of its estimates has widened steadily, covering more and more aspects of the Nation's economic structure and linking them with related data. From the initial set of estimates limited to factor shares or income originating in the productive branches of the economy, the work has grown to encompass a relatively full set of accounts covering the productive origin, income distribution, and product use aspects of the economy; and now includes State (and, recently, metropolitan area) estimates of income, attempts at measurement of the size distribution of income, and, most recently, linkages to input-output. The rate at which this income estimation work expanded has varied since the mid-thirties, but a brief glance back over those decades testifies to OBE's continuous effort to extend the usefulness of the central framework, either by augmenting detail within already given broad categories or by linking the estimates with related bodies of data to illuminate additional aspects of economic structure and change.

DEVELOPING TIMELIER ESTIMATES

Second, while maintaining and improving the reliability of the estimates, OBE appears to have been continually attempting to make the results more timely by covering shorter intervals and minimizing delay in reporting changes after they occur. Quarterly estimates have been added to annual, and for some components, particularly personal income, monthly estimates have been available for a number of years. This shortening of the time unit naturally means less delay between occurrence and reporting. Although I am not familiar with the requirements for such prompt and detailed measurement of a huge national economy, I can imagine that a tremendous skilled effort and efficient organization of resources must have gone into this remarkable accomplishment.

The result has been wide acceptance of the estimates, not only by economists who use them for analyzing problems of economic structure and change, but also by business firms and the press—to the point where gross national product and national income have become household words. The estimates are used not only for purposes of observation and study, or of general intelligence, but also as an important set of data to draw upon in deciding both public and private business policy. The national product series has become an indicator of current changes in major aspects of the economy and perhaps the most general gauge of the performance of the economy; it is a nationwide indicator used by government, business, and the general public as the most comprehensive measure of the current attainment (or failure) of the U.S. economy.

OPPORTUNITY COSTS OF SUCCESS

This successful effort was not without opportunity costs: they become apparent when

basic questions about the definitions and sectoring within any set of national product estimates are raised. Many of these basic questions do not admit of simple and unequivocal answers; their solutions depend upon the purposes for which measures of national product and its components are to be used and, perhaps, upon changing times and conditions. The penalties of success become clear when it is realized that the wide use of the estimates to measure current short-term changes in the economy makes the cost of experimenting with them, of using alternative variants and imaginative adjustments required for other equally important uses of the estimates, extremely high.

Adequate discussion of these perennial problems of national income and product definition and component classification is not possible here. A wide literature already exists in the economic journals and the publications of the Conference for Research in Income and Wealth over the years since the mid-thirties (and even earlier, going back to the foundation of the economic discipline in the eighteenth century). I mention only two broad questions as illustrations, assuming that they are sufficiently familiar and do not need long explanations.

Classification of Government Outlays

First, in the OBE series, government purchases of goods are all treated as final consumption and, hence, final-product. This is clearly questionable in the case of government expenditures to maintain security and peace and to provide administrative, judicial, and legislative services—all an intermediate type of service. Government investment in material capital and research, which is part of capital formation, should be added to capital investment. And while direct services of government in the form of education, health, and recreation facilities are clearly final-product, they would best be added to final consumption rather than viewed as government consumption. The lumping of all government purchases of goods into one final category affects the meaningfulness not only of the aggregates, by including a changing element of duplication, but also of consumption by members of the population and of capital formation, by excluding the components of each provided by government. However justified the present treatment, in terms of nonresale as a criterion of finality, which may be relevant to short-term problems of adequacy of market demand in a Keynesian system, such definitions and classifications are clearly inadequate if national product and its major components are to be used to measure the contribution to final consumption of the population and to capital accumulation of economic activity over longer term periods. To be sure, OBE has published a useful functional breakdown of government outlays since 1952, but it has never become an integral part of the national product accounts, nor has it been used in experimental calculations to derive alternative product totals as more relevant measures of economic growth.

Measuring Household Consumption

My second example is concerned with the intermediate components present in final household consumption, which change with the change in conditions of life required by

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economic growth, by industrialization and urbanization. Much of the recent discussion of the increased difficulties of life created by diseconomies of economic growth is a revival of this old question. Why, in estimating the components of household consumption, has no effort been made to allow for the effects of urbanization and the increasing complexity of life imposed by the production system, either by including or excluding some items; and why, in the construction of price indices for the deflation of household consumption, has no effort been made to adjust for the higher prices of one and the same set of goods in larger cities as compared with smaller, or in the cities as compared with the countryside?

Many other problems of definition and measurement could be mentioned, ranging from difficulties with the size distribution of income—a series now, I am happy to say, being worked upon again but, I hope, with a greater attempt to distinguish significant demographic and occupational groups among the family units—to those of estimating the output rather than the input of many components of the service sector. But these examples suffice to illustrate the many analytical and measurement variants that have to be explored if work on national income and product is to yield meaningful measures of longterm changes in the level and structure of a country's economic performance in the process of growth.

SHORT-TERM VS. LONGTERM MEASURES

Mention of these questions and variants should not be taken to imply an assured judgment that they can be effectively explored within the OBE program. There may well be a major comparative advantage in the preparation of short-term gauges of the economy based on rather simple (and arbitrary) answers to these basic questions, but which may still have value as measures of short-term changes. In fact, however, the current estimates of national income and product, in constant prices, are widely used as measures not only of short-term changes but also of growth, and are so interpreted even by Government agencies themselves.

One is reluctant to accept the implicit judgment that research activity within the Government on quantitative aspects of economic performance should be limited to short-term measures and should refrain from developing variants that would attempt to face the basic problems of economic theory and social valuation. Such a limitation would affect the usefulness of many aggregative economic indices, not only measures of national product but also measures of the cost of living, employment, regional differentials etc., which are particularly useful for analysis of the costs and returns from economic growth. Even given the interest of academic economists and nongovernmental research institutions in such measures and their work on these problems, some thought should be devoted to ways in which such analytical work could be encouraged within Government agencies—the repositories of so much knowledge of the data and so much experience with quantitative economic research. Because of its basic importance, particularly for broad aggregative concepts like national income and product, it would be especially valuable to consider ways of incorporating such analytical explorations into the work program of governmental agencies in the field.

STANLEY LEBERGOTT

Better Bricks for OBE's Structures

28

There appears to be no record of climbers reaching the top of Mount Everest and promptly asking each other, "O.K., which one do we climb next?" Yet OBE, after performing its heroic feat of transforming vague concepts and dubious data into tightly articulated, universally used sets of national economic accounts, has posed just such a question. We should not, therefore, tarry to emphasize the varied and immense accomplishments of the past. (It is possible that even the Secretary of Commerce didn't notice the first set of national income accounts OBE sent to Congress, but it is certain that no day, and few evenings, now pass on which the Council of Economic Advisers, the Federal Reserve Board, and many others do not refer to data from the accounts and from the OBE investment forecasts in working out policy positions.)

The primary task of OBE in the near future is simple. It should call a halt to all this progress. Nearly every known economic policymaker, public and private, relies on its data, often to the point of almost neurotic concern with second differences in component series. OBE must now insist on getting raw data for its use that would warrant continued wide use of the accounts. If not, it should consider the ultimate threat—stopping publication for a while. (Users might subsequently become excessively concerned with the results flowing from dynamic econometric models that utilized such improved data and accounts, but surely that is a problem for those in charge of OBE's third half-century.) Let us consider some of these areas for quality change.

REINSTITUTING INCOME DISTRIBUTION

In the early sixties the Nation's concern with poverty began escalating. Publicists offered explanation after expostulation, Congress passed program after program. And OBE stopped publishing the only adjusted, and the most reliable, estimates of the U.S. income distribution. Now these data—indeed, any good data—may have been irrelevant either to public concern or to policy choice. But the flow of references to what "official" income distribution figures show continues unabated. Hence it would seem desirable once again to have income estimates that allow for known limitations of the field survey and IRS data. (The adjustment procedure tended to reduce the proportion of families that were reported as, but were not actually, low income.) One hopes that the tiny amount of expenditure and the mild extent of interagency cooperation required to reinstitute the series on a solid basis will be forthcoming during the next fifty years. (Connoisseurs of conspiracy theories will notice the irony: an administration not widely considered to be radical continues to publish data that most probably overstate the extent of poverty.)

RECONCILING DATA INCONSISTENCIES

Once upon a happy time those who surveyed the current economy could (or did) put up with ridiculous inconsistencies between the reports on production and stocks, on sales, and on labor or capital inputs. But all this changed as the accounts expanded to include not merely balance of payments but national income, GNP detail, stocks, input-output, etc. Countless men and women of varied genius

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have worked to paper over such inconsistencies in order to create a set of accounts.

It is necessary to improve the quality of the bricks OBE is given for building these great structures. A massive improvement in Federal statistics is one solution, but a grossly improbable one. As I have suggested elsewhere, the minimum step is to provide OBE with copies of the key reports used by Federal agencies in creating the host of series that are then shipped over to OBE. (Key reports are those for the 1,500 corporations and governmental units whose activity in fact dominates changes in the accounts.) By working from these reports OBE could help reporting units and Government agencies to bring about a greater consistency than now exists. Sales reported to one agency might become comparable with the labor inputs reported to another or the product prices reported to a third. This process (unpardonably slow, pedestrian) would produce data of increasing reliability until that happy millenium when consistency in Federal data would make it unnecessary.

DEVELOPING HIGHER QUALITY DATA

A third OBE chore for the future would be to persuade, threaten, or beg users of its network of series that major advances must be made in the accuracy of the underlying data it is given. If users are to continue the frenetic process of scrutinizing every shift and jump in the OBE series, surely this is essential. Of the series needing improvement the catalogue is long and changing, but it should include those which cast doubt on important elements in the accounts and those whose revisions wipe out cycle turning points or report new major economic shifts.

FLOW OF FUNDS AND INCOME ACCOUNTS

It is hard to think of one competent politician, business analyst, or economist who is interested in the national income accounts but is indifferent to the related data on the flow of funds—or vice versa. The same applies to either of these accounts and the Government's variety of savings series. We would hope that by the twenty-second century these sets of data will be integrated in the only way they can be integrated, i.e., as the income data and the input-output accounts are now integrated. By putting them together, with responsibility centered, we can expect an increased consistency of data and a more fruitful development of each set.

EXPANSION OF ANTICIPATIONS SURVEYS

Although income accounts in the widest sense (including balance of payments, input-output, wealth, etc.) are of great interest, they are a mere starting point for most policy decisions. The White House official, the Congressman, who looks at them is really interested in the future, not in the historic past they report. Hence the OBE anticipations data (on manufacturers' sales and inventories) have developed a national clientele. But, having successfully dipped a toe in the anticipations river for the past quarter century, OBE should go in a bit further. Anticipations surveys for construction activity should be begun: such variations are surely as important for forecasting as factory investment. And anticipations surveys for new contracts and expenditures by the military are equally necessary. Probably more bad forecasts of GNP and revenue have been made because the Government didn't know what its own contracting officers were up to than ever derived from gaps in the national income accounts. Such surveys could be done by or for OBE, but, either way, anticipatory series for the major business and government expenditure series not now well covered will complement the here-and-now measures in the national income accounts and make OBE's contribution to understanding the economy of the next half-century even greater.

ROBERT LEKACHMAN

The Income Accounts of Tomorrow

29

Few would dispute the fact that American economic statistics are the best in the world or that the brightest jewel in the statistician's crown is the national income accounts. As the income concepts have been refined over the years, they have become more and more indispensable to forecasters, model-builders, business conditions analysts, unions, the business community, academics, and miscellaneous yea- and nay-sayers to the American celebration. The last category can usually find somewhere in the rich menu of data evidence which validates the alternative judgments that progress is rapid or deterioration is swift. And, which is a considerable tribute, even radicals have refrained from a serious assault upon the integrity of the national income estimators and on the validity of their findings for the purposes that those findings are designed to serve.

THE INCOME ACCOUNTS OF TODAY

Indicators of Market Activity

Like other teachers of economics and occasional commentators upon economic affairs, I have found indispensable the data so regularly and so promptly furnished in the *Survey of Current Business*. Accordingly, it is not mere ingratitude which prompts the remarks that follow but a sense that, admirably as the national income accounts have fulfilled the expectations of their pioneers and sponsors, they meet some current needs substantially less well. Let me specify. As presently constituted, the national income accounts do not pretend to be indicators of welfare, of economic welfare, or even of all economic activity. Instead, they are sedulously defined as recording those activities which either pass through markets or at least permit of market price imputation. The important economic activities which occur within households are not measured. (One waits for the first powerful blast from an economist deeply into Women's Liberation.) No attempt is made (directly, at least) to measure the considerable volume of criminal activity. What students do in schools and universities is not defined as an economic activity. In truth, what is currently trapped in the national income statistician's net is defined in part by congressional generosity at appropriations time, in part by the availability of data and the expense of collecting available information, and, for the rest, by the concepts selected for quantification.

Misuse of National Income Statistics

The students of national income have made modest claims and then more than fulfilled them. The uses made of their statistics by others are another matter. Journalists, even the economically literate in the trade, routinely use monthly Department of Commerce releases as true indices of the community's economic health. Textbook writers and

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teachers of economics who probably should know better slide readily into the habit of estimating American economic welfare in terms of per capita real income. The international comparisons that the textbook discussions of economic development are fond of making again feature per capita income as the talisman of victory in the international growth sweepstakes.

For this inflation and misuse of their findings, it might be argued, no blame can attach to the meticulous craftsmen who so honorably define and delimit their product. But even if no blame is appropriate, an implicit question hovers in the air, namely, why measure market activity in the first place? Surely not simply because it exists. Unless one believes, with the Victorians, who justified climbing mountains on this basis, that sheer activity is a good thing, the justification for adding up each year's national output must derive from its relationship, real or fancied, to some objective or objectives cherished by the bulk of the community.

Great Depression and National Income

There is only the smallest of mysteries once the matter is put in this way. Much of the impetus which Keynes's *General Theory* gave to national income study and research derives from the Keynesian proposition that income and employment rise and fall together. During the Great Depression the cure for unemployment was held to depend upon high and sustainable rates of growth in aggregate demand, so that the correct and timely computation of national income became the critical temperature reading of the economy's state of health. It follows that the tacit premise which all these years has justified concentration upon market activity has been its close relationship with employment. The layman's and even the economist's rough and ready identification of rising per capita real national income with economic progress and community welfare is thus the historical product of the Great Depression, a period when economic growth was looked toward longingly as the key to the employment of desperate millions of idle men and women. Democrats still run against Herbert Hoover and win often enough against such opposition to suggest that the Great Depression still possesses evocative power. Of all people, an economist would be the most foolish to claim that employment as an issue had receded in importance in a year (1971) in which the percentage of measured unemployment moved ominously in the direction of some of the worst months of the fifties. Thus it is fair to say that so long as dependable levels of high employment remain incompletely realized, some attachment to measures of economic activity is not misplaced.

Perception of Environment

What is manifestly diminishing among Americans, however, is confidence in growth and high employment as ends sufficient in themselves. If, as I do, one assumes that the wave of environmental and ecological concern is a belated but sturdy response to events which menace amenity, health, and life itself, rather than another passing fashion, then

one is unavoidably plummeted into a set of issues about which the national income accounts as currently designed have too little to say. Put as sharply as I am capable of putting it, the point amounts to this: a great many of the circumstances which surround the enjoyable consumption of material goods and services are deteriorating, and that deterioration is perceived with alarm by almost all Americans. Such familiar environmental hazards as air and water pollution in one of their guises decrease the pleasures of spending money. In another guise, they require rising defensive expenditures upon soaps and detergents, bottled water, air conditioners, dry cleaning, home insulation, patent medication, and dental and medical care.

No doubt it has always been true that families of average income spend a substantial proportion of that income upon personal maintenance and upkeep. Even now, the margin available for the enjoyment of discretionary expenditure must be narrow for the overwhelming majority of "affluent" Americans. So long as little alters in the social and physical environment which surrounds most consumers, the assumption might be legitimate that implicit in rising per capita real income figures is an improvement in personal welfare, for the margin for discretionary spending, though narrow, may be thought to be widening. More recently, something like a popular consensus has evolved that in fact the context of daily life and of daily expenditure is steadily worsening.

I do not report more than a perception of a perception, but insofar as this popular sentiment is strong and general, it casts a new ambiguity upon the significance of national income figures which record improvements in per capita GNP. If the ordinary family man notes that his own real income has risen at the national average or better and that, all the same, he feels worse instead of better, less rather than more in command of his own life, poorer instead of richer, then he may suspect that something has gone awry in Washington, or, if he has had the benefit of college economics, that the sacred idols of activity and growth have developed clay feet.

I possess no hard evidence of the improvement or deterioration in environment and amenity between any two dates or for any defined social grouping. This absence of reliable information is itself a difficult and complex challenge to national income estimators. New measures must be developed to register some of the impact of economic activity upon the enjoyment of its fruits. As E. J. Mishan has put the issue, what are the costs of economic growth? Or, after the Galbraith of *The Affluent Society*, how much does public squalor detract from private enjoyment?

THE INCOME ACCOUNTS OF TOMORROW

Definition of Environmental Quality

I write as a grateful consumer rather than as a potentially baffled producer of the basic data. In this role I report what I should like to have available and gratefully leave the terribly difficult conceptual and technical problems of materializing my vision to those better equipped to convert these dreams into realities. All I offer is some speculations. For one thing, the vague word "environment" requires some solid flesh. For the purposes

of argument, I would propose the following aspects of daily existence as major elements of perceived environment: safety of person and security of property, speed and convenience of travel to and from work, quality and accessibility of such recreational facilities as parks and beaches, quiet at home, clean air, and drinkable water. A community definition of terms like environment and amenity demands the sort of detailed investigation which generates the family budgets used by the Bureau of Labor Statistics and the poverty line definitions pioneered by the Social Security Administration.

An Index of Amenity

The qualities of environment and the dimensions of amenity are empirical questions, susceptible, presumably, to the techniques of sampling and public opinion analysis. If I had my druthers, the final product of such research would be a deflation device which, for want of a better term, I shall dub an index of amenity—another index number and, like its predecessors, subject to severe flaws in logical consistency but likely to be, like them, better than nothing. Since I am a deteriorationist at heart, I anticipate that such an index would sharply deflate the measured value of GNP. Equally, of course, it might inflate the figures, should it turn out some day that crime rates have dropped, mass transportation has turned into a smooth, rapid, and convenient pair of interludes for fortunate commuters each day, air and water pollution measurements are sliding persistently downward, jetliners have learned to whisper instead of shout, autos have begun to emit perfume instead of noxious particulate matter, and, no doubt, shrimp have commenced to whistle. Any index of amenity will grapple with our perception of ourselves as richer or poorer only partly as a function even of our real incomes. The sooner we take into account, even if at first, of necessity, awkwardly, the nonpecuniary circumstances that affect subjective prosperity, the sooner the national income figures will resume their convincing posture as general measures of individual welfare.

A Measure of Resource Depletion

If it is achievable at all, an index of amenity very probably lies at the end of a decade-long or even generation-long road. Numerous other ways to infuse new relevance into national income accounting are available. Professor Uzawa has advocated an annual deduction from GNP analogous to the capital consumption computation which now distinguishes GNP from NNP. In Uzawa's case the appropriate deduction would allow for the depletion of natural resources—the consumption of the irreplaceable original capital of the great globe itself. If, as is frequently alleged, the industrialized countries of the West (plus Japan) are exhausting energy sources and consuming raw materials more rapidly than nature replaces them and if, further, the gap between use and replacement is widening annually, then each year's deduction from GNP will increase. This new interpretation would again validate the untutored man's uneasy feeling that he is poorer than the experts usually assure him that he is.

A New Look at Consumer Choices

In a recent *Quarterly Journal of Economics* article, Professor Leontief describes how pollution as product and the costs

of its elimination can be conveniently inserted into the matrices of input-output analysis. Something would be gained if the private, business, and public costs of coping with pollution were aggregated and subtracted from the national income totals.

Pollution exemplifies a more general situation, however. For a very long time, national income estimators have demonstrated a salutary agnosticism as far as the consumer choices of their fellow citizens are concerned. At least as an ideal, the statistician measures what the market registers—and nothing more. Passing value judgments on public taste is none of the statistician's affair. If acid rock sells better than baroque chamber music and *Playboy* appears on more coffee tables than the *American Economic Review*, so be it. The U.S. is still De Tocqueville's America, where the silent majority's claim to its opinions of what it buys is inferior to none.

This stance has, over time, demonstrated its merits, not the least of them being the preservation of its devotees from political damage. From my present perspective, the drawback of agnosticism toward the market is related to the circumstances that much of what silent majoritarians purchase is perceived *by them* (not just by wandering members of snobbish elites) as a grudging response to personal danger (as in the acquisition of fierce dogs, burglar alarms, locks, and firearms), environmental hazard (as in the purchase of air conditioning and home insulation against intolerable noise), or direct defense of one's personal health (as in the reluctant decision to move from a more to a less convenient residence). Such expenditures are quite likely to strike the men and women who make them as coerced. They are among the *costs* of personal enjoyment rather than the enjoyment itself.

It is a deficiency of current national income calculation that the general rubric of market activity is made to cover both the pluses of personal gratification and its costs. Pluses and minuses are lumped together every time national income includes both the value of cigarette output and the costs of treating the cases of lung cancer, emphysema, bronchitis, tuberculosis, and coronary occlusion which are byproducts of smoking. It is equally wrong to total arithmetically the value of automobiles sold and the associated costs imposed upon the community for cleaning and medical care. My prejudices assure me that in relation to the pluses the minuses are growing in significance. But if a resolute attempt to resolve some of the immediate technical problems is successful, and careful measurement demonstrates that the minuses are becoming relatively less important, so much the better. Either way, the community will gain some valuable information to substitute for intuition.

My agenda is a difficult and conjectural one, yet the manifest technical excellence of American national income accounting encourages me to believe that my hopes are not necessarily totally visionary. I say in conclusion only this: if the national income accounts are not amended in the interests of greater relevance (as the community now identifies relevance), they can only become increasingly refined computations of activities which interest fewer and fewer people. Half a century of work deserves a better fate. My respect for the workers involved suggests to me that the next half-century will produce results even more impressive than those of the first fifty years.

30

WILFRED LEWIS, JR.

More and Better Statistics for the Seventies

Congratulations on the fiftieth anniversary of the *Survey of Current Business*. I need hardly say what an absolutely indispensable reference work *SCB* has become over the years for economists in all fields, whether their interest be the analysis of national economic trends, of State or metropolitan area economies, of international trade and the balance of payments, or of production and markets at the level of individual industries. Since the National Planning Association is itself a statistics producer as well as a statistics user, we are unusually well qualified to recognize the exacting nature of the work that lies behind the published data, and we are more appreciative than most of the timeliness, accuracy, and relevance of the statistical output of the Office of Business Economics. The U.S. has long had by far the best economic statistics of any country in the world, and this superiority is directly traceable to the inspired and untiring efforts of OBE.

It may seem ungrateful to take this occasion to ask for still more and better statistics, but the problems of analyzing our increasingly complex economy, in which the demands for more soundly based public and private economic policies also keep growing, require it. In saying this, I want to be clear that I am not speaking of our own data needs here at NPA but of the data needs in the society at large, which I believe I have some competence to judge. The following suggestions are all high-priority needs; I have not tried to list them in order of priority.

WEALTH ACCOUNTS

It is important to move ahead in the integration of our monetary and wealth statistics with national income statistics. Important progress has been made in reconciling the flow of funds statistics now produced by the Federal Reserve with the national income estimates. But we should have a fully integrated accounting system, in which the monetary and real income data are regularly available on a fully comparable basis. Similarly, we should strive for publication of statistics on national wealth and changes therein on the same schedule as, and fully articulated with, the national income estimates.

A NEW NNP

There is growing concern with the inadequacy of our conventional GNP and national income measures as indicators of national welfare, it being increasingly the case

—and increasingly recognized to be the case—that GNP as conventionally defined includes not only the cost of producing goods and services for the satisfaction of human wants but also the costs of repairing damage to the environment brought about in the production process. In my view, we should try to develop a measure of "net" product that excludes the costs of maintaining the quality of the environment (comparable to the present exclusion of physical capital used up in the production process in the conventional definition of net national product). I am aware that there are enormous definitional as well as measurement problems in any such attempt, but I nevertheless believe this is a vitally important area of research.

PRODUCTIVITY IN THE PUBLIC SECTOR

We need also to develop better measures of productivity in the public sector of the national accounts, which means better measures of the output of government. The present treatment, which uses inputs as proxies for output, denies the possibility of changes in the productivity of government and therefore begs a lot of important questions. More generally, better methods of measuring real output in all the service sectors of the economy are needed.

STATE VS. LOCAL EXPENDITURE

A breakdown of State and local government outlays, separating State from local, would be very useful, and would not appear to be unduly difficult.

SIZE DISTRIBUTION OF INCOME

It is extremely important to have better data on the distribution of personal income by size of income class, fully integrated with the national income statistics. The design of many of our most important public programs and analysis of their effectiveness is seriously hampered by the paucity of statistics on the size distribution of income.

FORECASTING

OBE has gained increasing sophistication in a variety of forecasting activities but does not now make these forecasts routinely available through publication. I believe that ways can be found to publish OBE forecasts without compromising OBE's access to sensitive information on Government policy, and without calling forth undue criticism of the agency when the forecasts go wrong (as everyone's forecasts are bound to do).

To repeat, I hesitate to file requests for more and better statistics at a time like this. Nevertheless, I am confident that OBE will be continually striving to improve its services as it always has in the past, and so I pass on my own views as to which areas deserve the highest priority in the next few years.

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EDMUND A. MENNIS

31

The Survey *and the Financial Analyst*

Broadly speaking, the responsibilities of a financial analyst fall into two categories. If he is an industry specialist, he follows one or more industries and the companies therein that are publicly owned and could be recommended for investment. His job is to familiarize himself with the historical data on these industries and companies, to analyze the impact of changing business conditions on them, and to project future company earnings trends and the prices at which their securities could sell in the marketplace. On the other hand, if he is a portfolio manager, after familiarizing himself with the objectives of an investor, he recommends an appropriate investment policy in the light of current economic and financial developments and selects appropriate industry and company diversification and the particular corporate securities that meet that investor's objectives. In discharging his responsibilities, the analyst is not only helping the individual or corporate investor but, in a broader sense, he is acting as a guide to the efficient allocation of capital in the economy.

In discharging his responsibilities, the financial analyst needs a thorough understanding of economic and financial trends and of the outlook for the economy and for particular industries. For such a task, material provided in the *Survey of Current Business* is a constant and invaluable source of vital information. Very few of the voluminous facts provided by the *Survey* cannot be used at one time or another by a thorough financial analyst.

USING THE *SURVEY* TODAY

The first use an analyst can make of the *Survey* is to obtain information about the past and projected developments in the economy. For a hasty review of recent developments, he can consult the four pages of charts in each issue that give a visual picture of major areas of the economy. For more detailed analysis, numerical data in tabular form about practically every aspect of the economy are spread throughout its pages, some published on a recurring basis and others in the form of special reports.

National Income and Product Data

From a broad economic point of view, the most useful information in the *Survey* is the presentation each month of key information on the national income and product accounts and, once a year in the July issue, the revisions and updating of historical national income and product data. In addition, historical data on industrial production, business sales and inventories, and prices, labor force information, and a wide assortment of financial data are made available. The *Survey* regularly presents reports on business intentions for plant and equipment spending and also manufacturers' expectations about sales and inventory levels. All of this information is the core of economic analysis and economic forecasting.

Industry Data

For the industry analyst, the *Survey* is probably the best single source of information on particular industries. Therein he can gather information about production, employment, inventories, exports and imports, the labor force, and prices. Of course, there are other sources of such information, but the *Survey* invariably represents the point of departure for any analytical work in this area.

International and Regional Data

For international analysis, the *Survey* provides information about the balance of payments, plant and equipment spending

abroad, and sales of foreign affiliates; from time to time, it publishes special reports about international developments and their implications for investment in the U.S. It also benefits the analyst who follows companies the sales of which are geographically concentrated by providing regional analyses and analysis of factors such as personal income by State.

Corporate Profits

Key to any financial analysis is an understanding of the profitability of business enterprise and of the factors that affect corporate profits. In this area the *Survey* is particularly helpful, providing not only aggregate data with respect to total corporate profits on a national income basis but also a breakdown of gross corporate product and domestic corporate profits on a current dollar basis, as well as unit cost data for nonfinancial corporations in a degree of detail not heretofore available. This information provides a valuable insight into the trends of corporate profits in the postwar period and the factors that have influenced the changes that have occurred.

Input-Output Data

One further service provided by the *Survey* is its occasional publication of input-output tables that can provide a penetrating analysis of interindustry relationships and the impact on various industries of alternative economic developments. Analysts have not yet taken full advantage of this work, primarily because of lack of knowledge about the input-output techniques and also because the information thus published is felt to be somewhat outdated. However, with the publication of more frequently updated input-output tables, input-output analysis should become a critical part of every analyst's toolkit.

THE *SURVEY* OF TOMORROW

With respect to areas where information provided in the *Survey* could be improved or expanded to aid the financial analyst, several suggestions come to mind.

Corporate Gross Product Data

One of the most important would be a still further expansion of the invaluable information contained in the analyses of corporate profits. At the present time, gross corporate product and its components are divided only into nonfinancial and financial sectors. A further disaggregation of the nonfinancial sector would be extremely useful. If this information could be subdivided into major industries and if the financial sector could be analyzed, a much deeper insight could be provided for financial analysts. A second bit of information in the profit sector that could be most useful would be not only a disaggregation of unit costs by major industry but also an analysis of the components of unit labor costs: output per man-hour and compensation per man-hour. At the present time, this information can only be obtained in

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a general sense from data published by the Bureau of Labor Statistics. In a profit-oriented economy, the measurement and understanding of the factors influencing profits should be of considerable importance not just to the financial analyst but also to corporate officers and Government officials. To the extent that further disaggregation can be provided, the analysis and understanding of profits will be significantly improved.

Publication of Econometric Forecasts

A second way in which the Office of Business Economics could help the financial analyst would be to publish the results of the econometric forecasts that it regularly prepares. It is acknowledged that these forecasts might be taken as official Government forecasts or that political controversy might be stimulated by the differences between such forecasts and those provided elsewhere. Nevertheless, a good deal of work has been done in the preparation of these models, and a careful labeling of them for what they are should preclude most of the misunderstanding that could otherwise occur. Few private organizations have the staff or the capability to prepare econometric models, and the presentation in a more publicly available form of the material prepared by OBE would be of considerable help not only to the financial community but also to business at large.

A few more minor suggestions may be of interest. More frequent updating of the input-output tables and some analysis of the structural shifts in the economy from the earlier input-output models to more recent models would be most useful. OBE might also give consideration to publishing estimates of gross national product and its components on a monthly rather than a quarterly basis. Finally, for the material presented in the blue insert in the monthly *Survey*, a one- or two-page table indicating where prior historical data can be obtained would be helpful. It can be a considerable bother to search through the most recent biennial supplement to the *Survey* and go through the detailed description of the data in order to discover where earlier data are available. A single tabular list of sources of information such as is presented in *Business Conditions Digest* would be of great use.

None of these comments are meant to detract from the outstanding efforts of OBE to provide us with such a vital source of economic information. The *Survey* is an outstanding contribution to economic analysis and a constant reference for the busy financial analyst.

ARTHUR M. OKUN

Social Welfare Has No Price Tag

32

Happy fiftieth birthday to the *Survey of Current Business*. Long may it roll off the presses, recording and analyzing the growth of national income and product. Your national accounts system is a great accomplishment of modern quantitative economics; it supplies an intelligible, integrated, and invaluable body of information about the functioning of the Nation's economy. Its big summary number, gross national product, has become a household word and has even been enshrined in a clock.

GNP NO MEASURE OF WELFARE

Yet at a time when your numbers are experiencing greater use and greater attention than ever before, they also are getting more fundamental criticism than ever before. Put simply (perhaps to the point of caricature), the criticism is that, even after correction for price and population change, the gross national product does not yield an unambiguous measure of national welfare; a rise in real GNP per capita does not necessarily mean that the Nation has become better off, nor does a decline imply that it has become worse off. This diagnosis may be followed by either of two prescriptions: (a) ignore GNP, or (b) fix GNP so that it does measure social welfare.

I know you will not ignore the GNP. I urge you to bear the criticism with pride as a symptom and symbol of your success. I urge that you not try to "fix it"—to convert GNP into a purported measure of social welfare. You are doing your job so well that people are asking you to take on a different and bigger job. Resist at all costs, because you can't do that job. And if that expresses a lack of faith in your capabilities, let me hasten to add that nobody can do that job. Producing a summary measure of social welfare is a job for a philosopher-king, and there is no room for a philosopher-king in the Federal Government—especially not at OBE, even under the new proposals for creating super-grade slots.

As you well know, the critics are absolutely right that GNP does not measure social welfare. For more than a generation you have been telling the readers of the *Survey of Current Business* that GNP is not intended to measure social welfare. It is encouraging that at last some of the critics seem to be catching on. But obviously you have to keep on reminding them. Just recently in the January issue of the *Survey*, you published the wise words of my colleague Edward Denison to that effect. Only because the message seems to require so much repetition do I feel justified in restating some of the points that Denison made.

It is hard to understand how anyone could seriously believe that GNP could be converted into a meaningful indicator of total social welfare. Obviously, any number of things could make the Nation better off without raising its real GNP as measured today: we might start the list with peace, equality of opportunity, the elimination of injustice and violence, greater brotherhood among Americans of different racial and ethnic backgrounds, better understanding between parents and children and between husbands and wives, and we could go on endlessly. To suggest that GNP could become *the* indicator of social welfare is to imply that an appropriate price tag could be put on changes in all of these social factors from one year to the next. This is hardly a minor modification of the national accounts. It is, as I have suggested, asking the national income statistician to play the role of a philosopher-king, quantifying and evaluating all changes in the human

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scene. And it is absurd to suggest that, if the national income statistician can't do that job, the figure he writes for GNP is not interesting.

We all display better sense in judging family welfare, avoiding verdicts intoxicated with the brew of economic determinism. We know that income is an important attribute of any family: the size of its income is an excellent indicator of whether the family is likely to be suffering from malnutrition, to be having difficulty in realizing the full educational potential of its children, etc. If any man on the street were asked to judge a family's welfare, he would want to know its income and he would want to know a lot of other things about its members too—facts about their health, about their relations to one another, and to their jobs, their friends, and their society. Even our cliches remind us that the best things in life are free and that there are things like love and good health that money can't buy. These lessons are equally important and equally applicable in the evaluation of social well-being.

MARKET-ORIENTED PRODUCTION

What you can and do measure as national income statisticians is the output resulting from market-oriented activity. The key to market-oriented activity is the presence of price tags. These are the essential ingredient in any objective standard of measurement that you can apply. Price tags enable you to sum up in a meaningful way physicians' prescriptions and phonograph records and pounds of steak and packages of beans. You can add up all the things that money can buy. But if you were to be seduced by your critics into inventing price tags which neither exist nor can be reasonably approximated for things which money can't buy, you will have sacrificed any objective yardstick.

Analogously, the institutional structure supplies the yardstick for the important distinctions you must make between final and intermediate products. As a good first approximation, the things businesses buy for current use are acquired for transformation into some marketable output, and they are intermediate product because they are purchased for resale in some broad sense. On the other hand, the items which government and consumers buy are being acquired for ultimate use and are final product. Finally, the externalities and spillovers of economic life—those costs (and benefits) imposed on other people by somebody else's consumption and production—get reflected in GNP only when society gives them explicit recognition. If society places a restriction or a tax (or a subsidy) on some activity, the national income statistician picks it up. If society's verdict is that it is too trivial to matter, the national income statistician follows that verdict. Perhaps OBE needs to insist more clearly and more often that you are not saying that the market, the institutional structure, and the legislation on external effects are all right and perfect—but merely that you must base your bookkeeping on the verdicts of society and must confine your efforts for social reform to evenings and weekends, with due regard for the provisions of the Hatch Act.

As we have known for decades, the guiding principles still leave some fuzzy boundary-line areas. Some of the questions about where to draw lines are terribly perplexing. I would not be prepared to defend to the death your current treatment of such matters as gross vs. net national product, consumer interest on personal debt, the omission of all services of capital from the government sector, and the absence of any government intermediate services. But the current system is a workable arrangement, and when I don't like its answers, I can roll my own, relying on the detailed information you provide. You should continue to think about the difficult boundary-line issues. But you should not, I would insist, introduce major changes in the concept of productive activity, the boundary lines between final and intermediate product, and the evaluation of externalities. Let me run

through some examples of changes you should *not* make.

HOUSEWIVES' SERVICES AND LEISURE

For good reasons, you violate the normal institutional boundary line between business and consumers when you impute the rental value of owner-occupied housing. You do this because the owner-occupant is short-circuiting the market that tenants go through. You do the same thing for food which farmers produce and consume within their own households rather than sending to market. Why, the argument goes, should you not treat the housewife similarly, as short-circuiting the market and providing services which other families obtain by hiring domestic workers? I find it a compelling argument that a housewife is not a maid—and that this difference is of a higher order of magnitude than the difference between the title to a house and a lease. The activity of a housewife is not that of a maid, and valuation of the housewife's hourly services in terms of the wage rate of maids, or any multiple thereof, would not translate her activity meaningfully into dollars and cents.

I have never been disturbed by the well-known paradox that, when the bachelor marries his cook, the national product goes down. The GNP is measuring the output of market-oriented activity, and market-oriented activity is reduced by the cook's marriage. Whatever she does as the mistress of the household is a different type of activity, oriented toward different objectives than receiving her pay at the end of the week. Why is this any more paradoxical than the fact that the national product will go down if I take a month's unpaid vacation in order to travel around the world? In both cases, the marketable output of the Nation is reduced, but that doesn't mean that welfare is reduced. If I made a rational decision, the psychic value of that trip must have exceeded the sacrifice of income. But if on that account it is argued that the GNP must not be allowed to fall, then I must ask how to evaluate the same trip if I had made it on paid vacation and had not had to sacrifice income.

The vacation example gets us into the largest element of what might conceivably be viewed as potentially marketable services that do not show up in the national accounts, i.e., time allocated to everything but work. I suspect that, if we lived in a world in which everyone had the option of working precisely as many hours as he wanted every week at a fixed and known wage schedule, a plausible —although still not compelling—argument could be made for evaluating leisure as a consumption good. In such a world, one might argue that the individual must explicitly decide to withhold some portion of his potentially marketable services, and thus to sell that time to himself for consumption purposes. But the real world has more or less standard workweeks and imperfect opportunities for moonlighting. In the real world, the current practice of ignoring leisure in the GNP is the only sound and sensible treatment. Leisure is a good thing, but it is one of the many good things which do not bear a reasonably determinate price tag. It is an important subject for analysis and evaluation and research, but it does not belong in the GNP.

TELEVISION AND RADIO

Whatever the conventions of accounting and the rules of the Internal Revenue Service allow firms to treat as the current cost of doing business shows up as intermediate product in the national accounts.[1] Generally, this concept of intermediate product is reasonably satisfactory. To me, its most puzzling single consequence is the resulting valuation at zero of television and radio services to the consumer. Insofar as programing over the

[1] An exception is the imputation for food and lodging furnished by business firms to their employees.

airwaves is supported by advertising, and advertising is viewed as a cost of doing business, no final product valuation is attributed to the services. If advertising costs raise the prices of such products as cosmetics and breakfast foods (in the base year for constant dollar valuation), radio and TV fare may be counted to some extent, although in the wrong place. But so long as radio and TV programs are free goods to the consumer, it is as meaningless to put a price tag on what comes over the airwaves as it is to put a price tag on air itself. This is a perfect example of the general principle that, if market behavior doesn't tell you how much something is worth, you have no way to tell.

"REGRETTABLE NECESSITIES"

It is obvious that many of the things consumers buy are not intended for pure enjoyment, but rather are a means of avoiding discomfort or preventing deterioration of physical and human capital. Yet you count them all as final product. You have been urged to try to eliminate "regrettable necessities" from final product and thus to classify them as a cost of living rather than a source of satisfaction. Don't start down that path. If you should do so, regrettable and unnecessary as it would be, you would find it winds along forever. Physicians' services and all other medical care costs are obvious regrettable necessities. So are the services of lawyers, policemen, firemen, sanitation workers, and economists (including national income statisticians). So are heating and air-conditioning outlays. Except for the few people who live to eat rather than eat to live, food is a regrettable necessity. Indeed, it is hard to imagine any output which clearly serves the purpose of pure, unmitigated enjoyment. But even if you could invent some arbitrary definition that kept final-product consumption from falling to zero, the exclusion of regrettable necessities would make no sense. It would deny the distinction between meeting one's necessities and failing to meet them. If air-conditioning is a regrettable necessity in 1971 to those who enjoy its services, then it must be a regrettable necessity to someone who does not have it, and it must have been a regrettable necessity fifty years ago when nobody had it. Excluding the services of such items as might be deemed regrettable necessities is palpably unsatisfactory. As Denison put it, "It yields the false result that we are equally well off whether, in the same circumstances, we ride or must walk to work, freeze or are comfortable, do or do not obtain medical care when we are sick, or provide or do not provide for national security. Needs and provision to meet them must be separately evaluated." [2]

EXTERNALITIES

It is obvious that the producer does not incur all the costs of producing certain types of output, nor does the consumer get all the benefits. The producer who belches forth smoke or who sends effluent into the rivers is imposing a cost on society which is not reflected in his private costs of production. On the other hand, the clearing of a swamp or the creation of a park may generate benefits which are equally absent in your measure of the gross national product. Although externalities obviously go both ways as costs and benefits, there is no reason to believe that they balance out on the average or even that their net balance is small. Why, then, it can be argued, should you not try to estimate the net deterioration (or improvement) of the environment as a cost of productive activity, netting it out of GNP? Again, I must ask how such a valuation could be made if the market and the democratic process don't generate the price tags. Following your present rules, you will reflect the costs and benefits that society recognizes and responds to. If a ban is placed on activity

[2] *Survey of Current Business*, January 1971, p. 15.

that is inherently dangerous, or fees and taxes are imposed, you will follow the signals and properly reflect them in your valuation of output. If society changes its mind, you will make some rather puzzling changes in your definition and coverage of outputs. But any puzzles that arise concern the volatility of the Nation's collective judgment, not of OBE's practices. Your principle of excluding the output of illegal activity from the national product abides by the social judgment that some activities have such important negative externalities that they subtract from society's output even though somebody is willing to pay for them as an ultimate consumer. However sensible or foolish it was for the Nation to decide that the sale of alcoholic beverages was illegal and then that it was legal again, it was completely sensible for the national income accountant to follow these verdicts. Regulations and incentive taxes or subsidies are less extreme forms of the outlawing of activity and are subject to the same accounting principles.

MEASURING SOCIAL PERFORMANCE

Let me make clear that these possible conceptual revisions would not seriously impair the usefulness of the national accounts for the analysis of economic fluctuations and growth. Even if you did all the things I am telling you not to do, I could still get what I need out of the national accounts. Yet I urge against such changes with conviction because, as I see it, the big danger is that, by taking a few steps in the direction of an allegedly more comprehensive measure of welfare, a reformulation of the accounts might mislead the Nation into supposing that GNP was at last measuring social welfare. And that would impede the progress which we so urgently need toward better measurement and evaluation of various changes in our social and physical environment, our health, and the diffusion of well-being across our society.

The critics have a genuine and strong case in wanting to know more about social welfare—they simply underestimate the magnitude of the problem in believing that any one-dimensional, summary measure like GNP could be fixed to handle it. There is a big job to be done, and national income statisticians and other economists can help do it. The experience of the national income accountants can be instructive to those who are working to develop social indicators (even though our possession of price tags makes us unique), and we surely should be ready to offer them technical assistance and support. In addition, for many of the issues noted above there is additional information that we ought to know about our society even though that information will not, and should not, be embodied in the national accounts. For example, we should know much more about what people do with their nonworking time, including manhours of pleasure travel, of nonmarket-oriented volunteer social and political activity, of commuting to and from work. Economists who have experience in collecting information on working hours may be able to help design and develop surveys to get such data. To take another example, we should know how much is spent each year by producers and consumers on specified activities designed to avoid or to remedy environmental deterioration. Within the economic realm, we need to know a great deal more than we do about the distribution among families of consumer expenditures and of investment in human resources, income, and wealth in order to evaluate the extent to which our society fulfills its egalitarian objectives.

In short, the GNP is not the whole story of our society or even of our economy, and no conceivable redefinition can turn it into the whole story. OBE can help in many ways to put together some of the other pieces required to develop the whole story about social performance. But you would not assist by compromising on the proposition that GNP is *not* a measure of total social welfare. The beauty of your present practice is that no sensible person could seriously mistake the GNP for such a measure.

33

JAMES J. O'LEARY

A Banker's Priorities for OBE

On the occasion of the fiftieth birthday of the *Survey of Current Business,* I am privileged to comment briefly on the work of the Department of Commerce's Office of Business Economics. The U.S. now is face to face with perhaps the most difficult test of public policy in our history—how to restore full employment and at the same time curb inflation and ultimately achieve reasonable price stability. Public policy measures must be timely and correct in the magnitude of their effect. The effectiveness of public policy is greatly enhanced by the wealth of knowledge which has been developed by OBE and the much greater speed with which the data are available. Without the fruits of the work of OBE, policymakers would be without a compass and without a radar screen.

The work of OBE is so comprehensive that it is difficult to know where to start in a commentary. The GNP accounts provide, of course, the basic tool of forecasters. The much richer detail of the data, and the greater speed with which they are available, provide economists with a most valuable tool for analyzing cyclical swings and secular trends of the economy. I find the recurring surveys of investment intentions to be an invaluable input into my own thinking about the economy. The input-output analysis is highly useful in forecasting the cyclical behavior of individual industries and firms within industries. In these days of threat to the dollar in international exchange markets, the balance of payments statistics are indispensable.

PERSONAL SAVING DATA

In what areas of economic intelligence should OBE devote more resources, assuming that the necessary budgetary resources can be made available? I would say that the area of greatest need is personal saving. At the present time (third quarter of 1970) the personal saving rate is running at 7.6 percent of disposable personal income. There is much speculation that next year the saving rate will decline significantly and that consumer spending will strengthen. It is my understanding that OBE does not obtain any direct information on personal saving—that the estimate is largely a residual of other data, namely, disposable personal income and personal consumption expenditures. We need to have much firmer data on personal saving—on its magnitude and on the reasons why people save and why they do not save. It is true that certain private agencies such as the Survey Research Center of the University of Michigan, the National Bureau of Economic Research, and the National Industrial Conference Board conduct surveys which shed light on the motives behind saving. However, it does seem to me that we should not continue to place reliance on private agencies and that OBE should devote substantial resources to making a major breakthrough in our knowledge of personal saving.

STUDIES OF PROFITS AND EXPECTATIONS

I would also like to see OBE devote more resources to enriching our knowledge of the behavior of corporate profits and the forces affecting profitability. In more general terms, it seems to me that in recent years the expectations of consumers, businessmen, labor, and investors have become more important in economic decisionmaking. The expectation of inflation has at times been a most powerful force. Perhaps OBE should be devoting some of its resources to finding ways to measure expectations.

These suggestions are not intended in any way to detract from the enormous contribution which OBE has made over the years but only to suggest areas of further improvement in our knowledge and understanding of the American economy.

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LOUIS J. PARADISO

Extending the Scope of Economic Intelligence

34

The fifty-year record of the *Survey of Current Business* has been one of continual improvement in quality and scope. Significant advances, however, have occurred in quantum jumps rather than in steady progression, mainly because of limited resources and the length of time required between undertaking a new project and implementing it fully.

After reading a copy of the *Survey* published in any month of the twenties, one is struck by the paucity of economic data available in that period. The broad economic measures available could be counted on the fingers of two hands. Analysts had series on industrial production, department store sales, chain store sales, merchandise imports, exports, carloadings, and a few more. And yet with so little to work with, they really did a remarkable job of interpreting economic developments.

QUANTUM JUMPS IN OBE'S WORK

The Thirties

A quantum jump occurred during the N.R.A. and New Deal days, when fresh data were collected to administer the programs of the thirties. The body of earnings data available as a byproduct of administering the Social Security program also proved to be a valuable addition. Toward the end of the decade, new surveys were initiated to gauge changes in factory operations: these covered orders, shipments, and inventories.

The National Income Accounts

The most striking advance made in the development of new data, however, occurred during World War II. In response to demands of policymakers for a measure of the effect of the war effort on the economy, the national income accounts were developed, thus providing a new and powerful tool for use in economic analysis. Since that time the GNP and income statistics have been expanded and improved by OBE, so that today historical and up-to-date information is available on practically every aspect of the economic scene. The national income accounts have provided a new dimension of data for use in economic analysis—a sophisticated and integrated system—which has become an indispensable source of information for policymakers.

Input-Output Analysis

Another quantum jump has occurred in the past several years, with the development of input-output analysis, in which for the first time industry sales and purchases were tied to and integrated with the national income accounts. The *Survey* articles designed to show the use of such data in analyzing particular sectors of the economy—such as residential building and consumer spending—are striking examples of the advances made in the analytical phase of the OBE work.

Regional Analysis

In addition, in the past several years, the scope of OBE's regional analysis and estimates have been greatly strengthened, as more detailed data on income and employment by regions and subregions have been assembled.

The OBE Econometric Model

Also, OBE has recently devoted part of its resources to the development of an econometric model within the framework of the national income accounts. This relatively new tool of analysis is becoming indispensable as a means of getting answers to many economic problems which heretofore were obtained only through eclectic approaches.

The progress made in the scope of economic data and analysis by OBE is strikingly evident from a perusal of copies of the *Survey*

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published under the able directorship of M. Joseph Meehan in the forties and fifties, progress which has been extended even more vigorously in recent years under the present brilliant Director, George Jaszi, and his competent staff.

Considering the relatively small staff and limited resources of OBE, its output and productivity over the years have indeed been astonishing. This is not to say that some changes are not in order, nor is it to imply that everything being done is just right. The very fact that the Director has asked for critical comments on the work of the Office and suggestions as to its future direction testifies to OBE's desire to make continual progress and to excel in its work.

I have no earthshaking suggestions to make with regard to the future work of OBE. I do have a few thoughts on particular phases of its work and program, some basic and others of minor importance; a few stem from questions that have been raised in my discussions with various private groups. These are not presented in any order of importance but are set forth as they come to mind. They are the kind of improvements which I believe may result in an even more extensive use of the output of OBE. First, let me dispose of some minor matters with respect to the *Survey* itself.

IMPROVING THE *SURVEY*

Placement of "S" Pages

Transferring the "S" pages of the *Survey* —the statistical compendium—to the center of the publication was a mistake. It is most inconvenient to users of text tables and other materials to have them separated by the blue pages. The "S" pages should be moved to the back of the magazine.

The National Accounts Historical Series

The July issue of the *Survey*, which contains the revised back data for the accounts, should publish these data through 1964. Comparable historical series can then be obtained by the use of the 1966 Supplement to the *Survey* and the latest July issue. There may be a problem of space, but if a new format can be worked out, the users of such data would be saved much time.

Rates of Change and Analytical Ratios

Very recently the *Survey* began publishing annual rates of change for some of the basic national accounts aggregates. Many other sectors should be covered—indeed, an entire page could be devoted to rates of change and to significant analytical ratios. Detailed inventory-sales ratios are published currently, as are the very valuable ratios provided for the corporate sector. Additional analytical ratios would be most useful, such as a table giving historical ratios of the major components of GNP to total GNP and ratios of major consumer expenditure categories to DPI or to total consumer expenditures.

Reorganization of the "S" Pages

The "S" pages contain about 2,500 series, some quarterly but the majority on a monthly basis. OBE should make a survey of its subscribers, libraries, and other users to determine the extent to which these series are being used. Many series are basic and must be included in the "S" tables, such as those on retail trade, prices, production, and employment. But the user would not resort to the *Survey* as the source for much of the data on commodities, for example, mainly because the commodity data contained in the "S" pages, in many instances, are incomplete for purposes of analysis. Perhaps fewer product categories with more details could be provided. A review project along these lines was

under consideration several years ago; it should be reactivated when and if resources are available.

Charts

Recently four pages of charts were included in the *Survey* about which several questions may be raised. They all begin with 1968, which does not provide a long enough perspective. A longer period, say from 1964 to 1970, might be more useful. Most of these charts are contained in *Economic Indicators* and in *Business Conditions Digest.* Some charts do not portray significant components, e.g., plant and equipment expenditures should include manufacturing and the utilities and communications industries and the Federal budget chart should include the surplus or deficit. If pages of charts are to be included, I suggest that they display the details of the national income and product accounts: such a presentation would be unique, not provided in any other publication. Alternatively, a new series of charts could be developed showing analytical relationships, for example, factors affecting fixed investment, relation of consumer spending to income, etc.

BETTER CAPITAL GOODS DATA

Expanding Anticipation Surveys

Very few basic changes have been made in the OBE-SEC plant and equipment expenditure survey over the years. In periods when the economy shifts its direction, the survey projections published in March turn out to be substantially different from the actual expenditures reported a year later. This difficulty is not unique to the OBE survey. There is no reason why this survey cannot be expanded so as to elicit much more information than is now obtained to help in making better projections.

I believe that each year new lines of information should be obtained. For example, what are the lags involved from appropriations and authorizations to new orders placed and expenditures? Can average lags be deduced? What were the major considerations in each year's investment decisions? Many interesting facets of this dynamic sector of demand could be pursued. I am not suggesting that the plant and equipment survey be expanded to resemble a Census-type project but rather that additional information is needed to better judge the forces affecting actual investment and investment anticipations. In this connection, I would like to see as a long-range objective a publication by OBE presenting the results of an in-depth study on investment and factors in investment decisions; such a study might include an analysis leading to projections of longterm requirements for capital goods.

Estimates of Fixed Investment

Continuing with the capital goods sectors, a question frequently asked is what the relation is between the plant and equipment survey estimates of capital outlays and those used in the GNP account. I believe that periodically OBE should publish a table showing such a relationship, similar to the current practice of publishing the relation between IRS profits and NI profits, the relation between merchandise trade on the Census basis

and the OBE concept, and the reconciliation between the Federal budget receipts and expenditures and the NIA estimates.

PRODUCTION MEASURES

Industrial Production Estimates

Over the next ten years or more, OBE should become the source agency for all industry production data. There is really no logic in having the Federal Reserve Board responsible for compiling industrial production indices except that the series was started there initially. The consumer credit series was originally compiled in OBE, yet it was recognized that it logically belonged in the FRB and was turned over to that agency.

Monthly GNP

But perhaps even more important is developing GNP on a monthly basis. This does not imply that all the items now presented in the quarterly tables should be developed monthly. A start could be made on the GNP breakdown. The task would not be overly difficult; monthly data are now available for most of the components and fairly good estimates can be made for the others. A reasonably reliable GNP monthly series would immensely enhance the analysis of the current business situation and be of considerable help to forecasters in giving them a more up-to-date GNP jumping-off point.

THE CONSUMER SECTOR

Consumer Expenditures

OBE has spent much effort in obtaining sound estimates of consumer expenditures by major and minor categories both in current and constant dollars. Because of lack of reliable data, the number of such categories has been reduced. Every effort should be made in the future to enlarge the list. For marketing purposes this would be invaluable. In addition to the broad categories of durables, nondurables, and services, another grouping should be considered, a classification of items according to their response to income change. Four groups may be distinguished: first, the group of items which are sensitive to income changes; second, the insensitive group; third, those about in line with income changes; and fourth, those having little or no relation to income changes. Such a classification of a large list of consumer items would be especially useful to market analysts. For the longer run, a thorough study of the role of the consumer in the economy would be an invaluable document.

Personal Saving

Perhaps one of the most important near-term projects concerning this sector is a portrayal of the relation between the personal saving derived in the income accounts as a residual between personal disposable income and personal outlays and the direct quarterly estimates of personal saving. Or, to put it another way, the question I have often been asked is: what is the breakdown of personal saving in the national income accounts by major savings categories? Despite the fact that this is a difficult undertaking on a quarterly basis, its resolution would lend comfort to those who question the reliability of a saving figure derived residually.

A detailed breakdown of personal saving would also help to clarify the factors that underlie the revisions which OBE makes periodically. For example, the published figure on personal saving in 1965 was $25.7 billion (August 1966 Supplement to the *Survey*); in the subsequent revision for that

year the figure was raised to $28.4 billion (July 1970 issue of the *Survey*). It would be of interest to know what components accounted for the difference.

Consumer Goods and Consumption

Also, an effort should be made to reconcile the category of consumer goods output index as published by the Federal Reserve and the consumer goods expenditures in real terms derived from the OBE data. On the face of it, one would deduce that the difference represents inventory change. In reality, there are other differences, such as the fact that some consumer-type goods are bought for business use.

This leads to the question of the allocation problems involved in breaking down total sales for some categories, such as automobiles and typewriters, into consumer and business use. OBE has devoted considerable attention to this problem, but perhaps additional periodic surveys are needed to estimate the proportions more accurately.

Retail Sales and Consumption

Finally, there is another perplexing problem which could be clarified if reconciliation tables were published. I refer to the relation between the movement of retail sales as published by the Bureau of the Census and the movement of consumer expenditures for goods incorporated in the OBE consumer expenditure series. For example, from the second quarter of 1969 to the third quarter of 1970 seasonally adjusted retail sales (Census) increased 4.6 percent, whereas consumer goods expenditures, seasonally adjusted, rose 6.7 percent over this same period (November 1970 issue of the *Survey*). There is no question that such a large discrepancy can be reconciled. It would be helpful to users, however, if from time to time the method used to arrive at the goods estimate were indicated—to what extent it is based on Census data, what other sources are employed, and what adjustments are made.

PERFECTING THE OBE MODEL

OBE has spent a goodly number of years developing an econometric model using the framework of the GNP accounts. This model is still in the experimental stage, and for this reason OBE is wise not to publish forecasts or special simulations as yet. More resources should be devoted to perfecting the model: it is the only approach available with which the chain reaction to a change in one or more economic variables can be traced and quantified throughout the economic system. Equally important is the immense knowledge that it would provide about the nature of economic relationships and the interdependence which exists among economic variables.

Publication of Equations

It is in this latter connection that I believe OBE should make its results available to the public. It would be quite profitable if OBE periodically were to publish in the *Survey* the structural equations derived in important sectors. This should include an explanation of what variables were tried, which were discarded, and what equations are currently in use. It should indicate how well the equation reproduced historical experience and should provide an interpretation of the impact of changes in the independent variables on the dependent variable.

Such presentations would greatly benefit other workers in this field who may be

groping to develop similar equations. Conversely, OBE could solicit equations which those other workers may have developed. The publication of specific equations would also be helpful to business analysts and others by providing them with a working formula to use as a starting point in projecting such quantities as business investment, profits, and prices. I believe that if such a policy were adopted it would be a great step forward in enhancing the value and usefulness of the *Survey*. There is a wealth of material available in the details of the econometric model which should be shared with a wider number of individuals.

PROJECTS TO BE REACTIVATED

While OBE has concentrated on expanding the scope of the economic series, some important information has been dropped for a variety of reasons.

Business Population Series

For many years OBE published data on the number of business firms by industry, on new firms started, and on deaths of firms. These were widely used and quoted. However, because of difficulties of estimation, problems of concepts and definitions, and discrepancies which arose between the levels of the OBE business population series and those of the IRS and of Census, a decision was made to discontinue these series. If and when resources are available, this project should be reactivated.

Income Size Distribution Series

The work on income size distribution by families and by single individuals was also discontinued because of data problems. The advantage in having such series developed in OBE is that the data are integrated within the national income framework. It would be desirable to reactivate the work on income size distribution. This is a crucial series in gauging the income status of families which cannot be judged solely on the basis of cash income but must include imputations and other types of income flows consistent with the concepts involved in the national income accounts.

The scope of the OBE work is so vast that a book could be written on the research and projects that can be pursued in the coming years. I don't think OBE really needs very much advice from outsiders as to how to keep itself busy. The staff is well aware of the areas of weakness in data and analysis. Data problems range throughout the accounts —from the foundations of the balance of payments detailed statistics to the measures of income of unincorporated enterprises. Perhaps in the longer run the most important contribution that OBE can make is to refine the basic concepts underlying the measurement of GNP and income. The present concepts are by no means fixed and rigid. National income experts are continually at work to make the accounts conform more closely to reality or to new theories. Concepts in some areas need to be reformulated, and, as they are implemented statistically, the accounts will become even more useful: for example, the scope of the data would be greatly enlarged if OBE in the coming decade were to undertake the formulation of concepts relative to national wealth and its measurement.

The foregoing comments are designed to illustrate the many paths which still need to be explored and developed. Other papers in this series have commented in detail on various aspects of the OBE effort. There is no question, however, that this organization has done an outstanding job in extending the scope of economic intelligence and has provided the Nation with by far the best set of economic statistics in the world.

SANFORD S. PARKER and TODD MAY JR.

Let OBE Tell All

35

As professional consumers of the *Survey of Current Business* for the better half of its fifty years, our dominant impulse in celebrating this anniversary is merely to call, gratefully, "All Hail!" Without the *Survey*, in all its roles—as a compendium of the primary data of others; as the generator of its own increasing array of invaluable series, beginning with the national income; and as analyst and catalyst of data through its various articles over the years—the arts of business forecasting could hardly have been practiced as they have been over these decades, let alone developed, insofar as they have developed.

This debt of gratitude can be made more specific by reference to all sorts of landmarks denoting the entry of *Survey* data into areas where only private angels formerly had dared to tread, with great effort and great dread. Today business inventory data, for example, are taken as commonplace, yet once there were none. To take other instances, where great private effort had to be expended to obtain income distributions or aggregations of capital stocks, now one just waits for the *Survey* to publish those data.

NEW DATA TO ANSWER NEW QUESTIONS

Reminiscence is only prelude, however, for new foci of interest develop, and one wishes for new breakouts in the data. It would be nice to have aggregations of public and private outlays for education or medical care, for example, with accompanying breakdowns of where spending goes in terms of payroll, types of goods, etc. Also wanted is an aggregate of costs of research of all kinds, public, private, and nonprofit, and an explanation of how those costs enter the sectors of the accounts; the same information would be useful for antipollution expenditures. At the tail end of the income distribution, it would be helpful to show public transfers and private gifts and earned income over time. All sorts of new compilations are becoming relevant in the developing climate of concern for the quality and equity of American economic life. And while it isn't fair to earmark everything for the plate of the Office of Business Economics or the *Survey*, their success to date is indicated by the fact that one tends naturally to look for the action in that quarter.

OBE CONTRIBUTION TO METHODOLOGY

But it is not only in the production of data that OBE and the *Survey* have achieved so much over the years—so much, indeed, that we are always calling on them for more. Equally important has been OBE's contribution to the development of discipline and methodology in the handling of data. Data processing, in some old-fashioned sense, has been the peculiar task of OBE, epitomized in the making of the estimates for the national income accounts. The requirements of a closed system force a confrontation with the fact that there are difficulties of all sorts in raw data, whether benchmarks or current series; that economic series are usually not maxi-

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mum-likelihood statistics; and that two techniques for measuring more or less the same economic variable do not always produce equal readings. In the process of reconciliation latent difficulties are forced to the surface and their causes probed. In closing its systems it is the peculiar task of OBE to face down conflicts, effect adjustments, and make the painful decisions that optimize the usefulness of the data. The decision process presents numerous scientific problems and sometimes offers only artful solutions.

A great deal that is worth knowing is learned and is learnable in that decision process about the quality of both the raw series and the statistical end products. An understanding of where discrepancies in the series can be resolved by logic and where by judgment can tell much about the quality of our information about the various facets of the economy. It is important to be able to identify the possibilities of error and their sources in order to judge the reliability of reported changes and, in particular, to form a basis for evaluating changes in comparative and qualitative terms.

It is not, of course, possible to summarize these things in handy little T-tests and standard errors. There is no substitute for exposition and explanation not only of what data are being used but of what has been found useful and what wanting, and why, and what is being done with it all. In the computer age the temptation is great to pass by the question of quality, to press time series to do work they may not support, even to lose sight of what amounts to the lore that has gone into the original manufacture and evaluation of those series.

This underlying methodological work has perforce grown over time in a number of ways. The national accounts have become more usefully complex; note, for example, the great strides made over the past decade in the corporate and government accounts. New ways of measuring old things—e.g., input-output—have been devised and put to use. Meanwhile, the demands on the system for precision have grown over the years, as the goals set for forecasting and policymaking have been raised higher, closer to some attainable or unattainable perfection.

EXPLANATIONS OF METHODOLOGY

The one complaint about OBE that has arisen during all these developments is that it has not correspondingly expanded its exposition and explanation of the problems, the

techniques, the lore, and, accordingly, the reliability of the estimates for given and changing purposes. Of course, the series used have been identified, and there have even been some reviews of the nature and direction of past revisions. But anyone working with underlying data in the accounts can see at times, for example, that further current adjustments in various series have been made, no doubt for excellent reasons, or that some component series have at times proved violently more unreliable than others in the period between the preliminary and the later estimate. When these matters are noticed or puzzled out, OBE is always helpful in responding to specific technical questions, but perhaps the staff's lives, as well as those of some of OBE's data users, could be made easier if more of these matters were indicated openly, before the questions are asked. Even more important here would be what can be learned about matters about which questions are not asked.

There are other and more explicit uses to which OBE could put what it knows. There is the perennial problem of checking its personal saving rate against an estimate from financial data and its figures on deflated manufacturing output against estimates from more physical data. There are times, too, when it is important but difficult, without the user's doing OBE's own work, to make sense of what the price indices are saying as compared with the OBE deflators, chain or implicit. It would be useful, as another instance, for OBE not only to present its econometric model but to review its performance and to explain the degree to which a refitting to later data alters coefficients and thus projections.

THE PITFALLS OF EXPLANATIONS

There is an understandable question raised here by this plea for greater freedom for OBE to tell more: will what will help the technical user serve merely to confuse the larger body of nontechnical users, who want to know results and not difficulties? There is also the matter of the formal relationship between the agency using a body of data and the one supplying it. No one likes it openly said that his data don't check out in some larger, logical sense, and so there is the risk that persons of position who are not technically informed will be put off, on either of these counts, and that they may perhaps even create false issues. But this larger world at some point has to face the fact that OBE's kind of methodological work is a necessary function of keeping the scorecard in the modern statistical world. There is hardly a place in Government where this work can be performed better than at OBE. It is the supply of results from this expanding methodological function that should now be increased.

RICHARD W. POOLE

36

The Survey: *Fulcrum for Regional Accounts*

When I began thinking about possible comments to celebrate the golden anniversary of the *Survey of Current Business*, I realized that the magazine has been an important source of information for me personally for over twenty years. In those years I have moved through such diverse positions as graduate assistant in a bureau of business research, research analyst in the general office of a large corporation, manager of a scientific and manufacturing development department in a metropolitan chamber of commerce, assistant to the president of a nonprofit foundation, manager of James E. Webb's Washington, D.C., office before he became associated with NASA, professor of economics, and finally, dean of a college of business. I offer these details simply to testify that the *Survey* is extremely useful to individuals and groups engaged in a wide variety of pursuits. Even though my career has deteriorated into a deanship, I still find myself relying upon the *Survey* to keep abreast of economic trends and as a source document for the many speeches I am called upon to make. So much for woolgathering. The remainder of my comments will be limited to the very important efforts of OBE and its Regional Economics Division in the field of regional accounts.

THE REGIONAL ECONOMICS DIVISION

I must begin by pointing to the obvious fact that people are behind the *Survey*—people whose dedication to research in the public interest has made the magazine what it is today. In the early sixties I was a co-director of a project funded through the Midwest Research Institute in Kansas City whose purpose was, among other things, the estimation of county personal income on a uniform basis for a six-State area, Arkansas, Oklahoma, Missouri, Kansas, Iowa, and Nebraska. Throughout this difficult project, carried on at seven different universities, the counsel of the OBE staff, and particularly of Robert E. Graham, Jr., was of the very greatest importance. It is well known by professionals in the field of regional economic and business research that the staff of the Regional Economics Division provides assistance which goes well beyond the data and analysis contained in the *Survey*.

REGIONAL INCOME ESTIMATES

State Personal Income Estimates

The growth of regional accounts published in the *Survey* has largely been limited to State personal income. During the first two decades of its existence the *Survey* contained very little regional data, although by 1939 there appeared a State-by-State rendering of income payments to individuals for the period 1929–37. After that, such estimates appeared on a regular basis. From 1944 on, the annual estimates have appeared in the August issue; to this day that issue remains the most important one for those working in the field of regional analysis.

The inclusion in December 1966 of quarterly estimates of State personal income was a most welcome addition to the *Survey's* contents, particularly for policymakers interested in keeping close tabs on State personal income trends.

The fact that regional accounts were not of major importance in the *Survey* until after World War II reflects not only the seminal characteristics of national income accounting during the twenties and thirties, but also the character of economic problems facing the U.S. during those years. It is not surprising that concern over regional development did not appear as a critical problem during the Great Depression, when excess capacity and unemployment characterized the most prosperous of regions; the same might be said of the super-full-employment period of World War II. In spite of the absence of a clear national purpose with respect to regional development, however, OBE continued and expanded its research on State income in the late forties and through the fifties. The 1956

publication of the supplement to the *Survey* entitled *Personal Income by States Since 1929* constitutes a benchmark effort.

Regional Development Programs

The growth of subnational economic policy as a national concern has been reflected in the regional data appearing in the *Survey*, together with the unpublished regional data prepared by OBE. The emergence of national programs for regional development such as the Area Redevelopment Act, the Appalachian Regional Development Act, and the Public Works and Economic Development Act, together with the emergence of an emphasis on cost effectiveness analysis for all Federal programs widened interest in regional accounts. Moreover, because many program impacts were not designed to be statewide, concern narrowed to substate accounts, and particularly to county personal income estimates.

SMSA Personal Income Estimates

The May 1967 issue of the *Survey* witnessed the beginning of the regular publication of limited county and multicounty personal income estimates. Consistent with national concern over income disparities between metropolitan and nonmetropolitan regions, this series has been limited to data for individual SMSAs together with that for the sum of all non-SMSA counties in each region.

FUTURE DIRECTIONS FOR THE *SURVEY*

Publication of County Income Estimates

What are some of the directions which I see for future issues or supplements of the *Survey?* First, it seems to me imperative that it begin publication of the entire system of county income estimates which the Regional Economics Division has been making. If this effort requires a special appropriation, then I urge that it be given. My considerable experience in work on county income estimation at the State and regional level has made me well aware of the resources required for such efforts. Moreover, there are considerable economies of scale in the production of county income estimates. Ordinarily, there should not be two competent research agencies preparing county income estimates for the same State. I recommend this action even though I am cognizant of the possible degree of error in estimating income for very small counties and the nearly insurmountable difficulties in estimating such components as property and proprietor income. It is possible that some sort of State or local review system might be developed before publication of county estimates to avoid gross errors which could be more readily identified by those familiar with State or local economies.

Policymaking with Regional Data

The editorial policy of the *Survey* has been, quite wisely, to eschew purely policy-oriented articles and materials more appropriate for learned journals. Nevertheless, it now appears to me that some interpretative treatment of the uses to which policymakers are putting regional data may be in order.

State Social Accounts

Finally, I would hope that Congress may see fit to provide funds to speed up and expand efforts at completing systems of State social accounts to parallel the components of the national system.

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ROBERT V. ROOSA

37

The Balance of Payments Accounts

Systematic and comprehensive balance of payments accounting has grown up with, indeed has very largely grown because of, the *Survey of Current Business* over this past half-century. To be sure, a sturdy earlier base had been built by Professor John H. Williams of Harvard, who also, along with Charles J. Bullock and Rufus S. Tucker, assisted in designing the first official statistics, carrying the record back to 1850. But it was in 1921, at the initiative of Commerce Secretary Herbert Hoover, that the Bureau of Foreign and Domestic Commerce really began the formalized, routine gathering of data from customs offices, banks, merchant houses, shipping companies, and various governmental agencies. The official tabulations of these data, first appearing in the *Survey of Current Business*, were buttressed from the beginning by the *Annual Balance of Payments of the United States*, in which the theoretical underpinnings and issues in data evaluation were more thoroughly explored than would have been possible in the *Survey* itself, where the emphasis had to be on presenting the final product.

FRAMEWORK OF DEFINITIONS

Much is still owed to the thoroughness of the work underlying the early official tabulations. It provided an unambiguous formulation of what was being measured, and thereby established a clear framework within which conceptual changes in the accounting structure could evolve as new elements moved into new importance. But also, because the initial definitions were precise, they made possible a remarkable overall consistency and continuity in the recording of transactions within the balance of payments accounts over the entire fifty years. Moreover, from the beginning, there was insistent recognition of the need for viewing the balance of payments from several sides for grouping the components in a variety of ways—in order to bring out for analytical attention the different clusters of elements that may affect the country's external economic position. That prismatic quality of the data also, very rightly, has prompted the Office of Business Economics (and its predecessors) through the years to remind users of the interdependence among many of the component accounts.

Indeed, at one stage the staff conceived a novel method for stressing the impropriety of labeling a balance "favorable" or "unfavorable" without evaluating the various changes throughout the accounts which permitted such a balance. They actually formalized a "law of detractions and promotions," demonstrating that an increase or decrease in any one account could only be balanced in foreign exchange terms by an equal and offsetting change somewhere else. The further searches set off by such concern—attempts to sort out the "gross" figures that produce the "nets"—have led to a tripling in the number of regular component items in the "standard" balance of payments accounts over their fifty-year history. It has also led to shifts over time in the grouping of accounts to be given leading prominence in the *Survey*'s presentations.

"VISIBLE" AND "INVISIBLE" ACCOUNTS

At first, the accounts were divided between "visible" and "invisible," as attention was, quite properly, drawn toward the increasing importance of capital movements, interest payments, tourist expenditures, and remittances, in contrast with the traditional emphasis on the "balance" of merchandise trade. And once students had been exposed to this grouping of the accounts for a time, they began to note that, for the U.S. at least, the visible transactions were comparatively stable in contrast with the highly volatile invisible flows. By the early thirties, the data supported a study showing that changes in the U.S. gold reserves were more closely correlated with net capital movements than with changes in the net trade account. Once the capital accounts were given greater prominence, however, the significance of another kind of classification became apparent: to distinguish between "final" and "reversible" payments flows, particularly in the case of financial transactions. That proved, or at least thus far has proved, virtually impossible to accomplish, and consequently the staff has turned as a possible substitute toward the distinction between "liquid" or "illiquid" assets acquired as a result of the payments flows. That distinction has in turn introduced about as many new difficulties as it has removed older ones.

BALANCE SHEET VS. INCOME STATEMENT

The use of these various terms has, moreover, led to confusion between the use of a "balance sheet" approach and an "income statement" approach in evaluating the sources of exchange disequilibrium. For even though balance of payments accounting has always intuitively seemed closer to an income statement, distinctions that rest upon the liquidity or the reversibility of particular assets or liabilities do suggest a balance sheet approach. It is, of course, the same kind of confusion between balance sheet accounting and income statement accounting that has led to so many problems in the analysis of individual business firms. But it may be one of the more promising aspects of this analogy that business accounting has found an important missing link in working out a quite separate, though wholly consistent, measure of a firm's cash flows—past, current, and projected. Indeed, it may be that a business cash flow statement represents the sort of concept toward which another kind of restatement of this country's external accounts should be directed. For surely it is from the net flow of cash payments that the residual position of U.S. reserve assets is determined. And it is the aggregation of these same flows (net of intended accumulation of transaction balances), combined with the flows occurring in and out of the Eurodollar market, which determines the potential pressures on the dollar in the foreign exchange markets.

It was presumably the effort to approximate a measure of significant forces affecting the Nation's reserve position that led originally to the focus on the liquidity balance. As the inadequacies of some of the arbitrary rules of classification implied by

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that approach became increasingly apparent, however, a special committee was appointed to review the issues again, under the chairmanship of E. M. Bernstein. By the mid-sixties that work had resulted in the addition of the so-called "official settlements" balance as a supplemental measure centering specifically on the flows in and out of the official reserves themselves. That had just been introduced when, characteristically, another set of forces began to play havoc with the intended role of the new measure—flows between the Eurodollar market and the U.S. and between the Eurodollar market and other important foreign currencies.

EURODOLLARS AND DEFICITS

Indeed it is now clear that neither the "liquidity" nor the "official settlements" balance adequately reflects the special characteristics of the U.S. balance of payments, that arise from the functions which the dollar has acquired, because it is the major international currency of the world, at the center of the new Eurocurrency market. The experience of 1969 and 1970 highlights how much still remains to be done to find a meaningful measure of the significance of many flows that are clocked through the recording devices. For in 1969 as in 1970, shifts of dollars between the Eurodollar market and the U.S., and shifts between Eurodollars and other currencies, dwarfed all other transactions in their net impact on this country's overall accounts. Yet these transactions produced strikingly different appearances under the two prevailing methods of measuring the U.S. balance of payments position. In 1969, the end result seemed to be a huge deficit of some $7 billion according to the "liquidity" measure; but a surplus of $2.7 billion on the basis of official reserve transactions. The reverse, in even larger numbers, appears to have occurred in 1970, with a liquidity deficit back down toward $3 billion, but an official settlements deficit close to $10 billion.

A non-national market, operating in extraterritorial dollars, can literally produce the difference between a statistical deficit and a surplus in the U.S. balance of payments, as presently measured. And it is conceivable that either or both results could be recorded at a time when all other flows across this country's own frontiers might be in balance. Moreover, transactions within that same extraterritorial "Euromarket" can also produce at times a substantial excess or scarcity of dollars in the foreign exchange markets, quite independently of any policies or performance of the U.S. itself. While the recording devices do measure with reasonable accuracy the end results of this market's operations, they do not yet provide any reliable indication of either the probable finality of some payments or the possible reversibility of others. And even when these end results have been measured, one may still wonder whether they provide a reliable criterion for judging the underlying viability of the U.S. economy, or the longrun strength or weakness of the dollar as a national currency. A further probing of the Eurodollar market, to try to develop some measure of the patterns of past flows, and current ones, would seem to be an urgent priority. That, it would seem, is at least one very important path along which to look for a continuation of the remarkable achievements already accomplished in the gathering of balance of payments data—under the dogged husbandry of a succession of able statisticians at Commerce, the Treasury, and the Federal Reserve.

SECTORAL INFLOWS AND OUTFLOWS

Until more can be accomplished in that difficult area, and perhaps even after the veil of the Eurodollar market has been lifted, there may be need for still one more way of slicing through the existing data to bring out additional meaningful implica-

Table 1.—Major Components of the U.S. Balance of Payments, 1958–69 [1]

[Millions of dollars]

	Private commercial	Government	Private investment	Money market	Errors and omissions	Reserve balance	Liquidity balance	Official settlements balance
1958	2,647	–5,870	–267	837	361	–2,292	–3,365	n.a.
1959	111	–5,082	1,592	2,084	260	–1,035	–3,870	n.a.
1960	3,974	–5,852	700	190	–1,156	–2,145	–3,901	–3,403
Average	2,244	–5,601	675	1,037	–178	–1,824	–3,712	n.a.
1961	4,664	–5,664	1,626	–127	–1,103	–606	–2,371	–1,347
1962	3,463	–4,913	422	741	–1,246	–1,533	–2,204	–2,702
1963	3,979	–5,871	1,913	111	–509	–377	–2,670	–2,011
1964	5,767	–5,777	401	556	–1,118	–171	–2,800	–1,564
Average	4,468	–5,556	1,091	320	–994	–672	–2,511	–1,906
1965	3,840	–5,951	498	969	–576	–1,222	–1,335	–1,289
1966	2,834	–6,938	1,796	2,231	–489	–568	–1,357	266
1967	2,266	–7,664	3,983	2,370	–1,007	–52	–3,544	–3,418
1968	–782	–5,926	7,317	988	–717	880	168	1,638
1969	–911	–7,651	4,723	7,867	–2,841	1,187	–7,058	2,712
Average	1,449	–6,826	3,663	2,885	–1,126	45	–2,625	–18
Three-year averages:								
1958–60	2,244	–5,601	675	1,037	–178	–1,824	–3,712	n.a.
1961–63	4,035	–5,483	1,320	242	–953	–839	–2,415	–2,020
1964–66	4,147	–6,222	898	1,252	–728	–654	–1,831	–862
1967–69	191	–7,080	5,341	3,741	–1,521	672	–3,478	311
Five-year averages:								
1960–64	4,369	–5,615	1,012	294	–1,026	–966	–2,789	–2,205
1965–69	1,449	–6,826	3,663	2,885	–1,126	45	–2,625	–18

[1] (—)represents transactions giving rise to a net outflow of funds, or a deficit; absence of sign indicates net inpayments, or a surplus. All data are from selected issues of the *Survey of Current Business*. Totals may not add due to rounding. An illustration of the composition of each item is shown in table 2, which details the data for 1969.

tions. To make such an attempt would, at any rate, be in keeping with the long tradition of eclectic experimentation in the Commerce Department's compilations of the balance of payments data. Using all existing components in the *Survey* tables, one can devise a four-way breakdown which—though falling short of the cash flow analysis that eventually may be achieved—does bring out major changes in the sectors most responsive to unique stimuli. These groupings may be classified as commercial, Government, longterm investment, and money market. The principal causes of inflows and outflows for each of the four are likely, because of the nature of each, to be quite different; or at any rate, at times, the dominant influence in any one will be quite distinct from the forces affecting the others. For example, commercial transactions are often largely dominated by the price and marketing conditions that affect the import and export of goods, while Government transactions are most closely associated with national objectives of security and foreign aid. Longterm capital flows are affected by the prospects for profitable investment abroad, and the return derived from past investment, while money market flows are very often the result in differentials in short-term interest rates between the U.S. money market and active money markets abroad (including the Eurodollar market).

INTERNATIONAL RESERVE BALANCES

The data presented in table 1, covering the years 1958 through 1969, have been developed in a separate article by the present writer and need not be labored at disproportionate length here.[1] The second table, for 1969 alone,

[1] Address to the International Conference on Financial Outlook, Geneva, May 19, 1970; reprinted as "The U.S. Balance of Payments: A Challenge to Past Policies," *Columbia Journal of World Business*, September–October 1970. (Several minor revisions due to a change in format and recent data revisions in the *Survey of Current Business* are incorporated into the tables.)

was prepared to indicate which specific subgroups from the basic *Survey* table are included in each of the four suggested principal components. (Data for 1970 were not available as this was written.) The sum of the four major components, plus or minus the errors and omissions, yields as a residual the current year's actual change in the usable international reserve balances held by the U.S. While actual changes in the reserves are subject to many constraints which require evaluation, they have consistently been much less volatile than either the liquidity or the official settlements balances, which are also shown in the first table. Perhaps it is not unreasonable to suggest that changes in reserves may be as good an approximation as can yet be found to reflect not only the net of all factors affecting inward and outward flows, but also the current disposition of foreign central banks toward holding dollars. As a sheer matter of arithmetic the size of outstanding dollar holdings by central banks (i.e., the "balance sheet" item) is so large that at any time central banks could cause a massive withdrawal of reserves from the U.S., even if on balance all other transactions were producing inflows. But the central banks have not done so. Some reflection of that fact, too, would surely seem to be an important part of any full analysis of the U.S. balance of payments position.

PAST AND PRESENT LESSONS

The most crucial part of such an analysis, to be sure, lies in what is revealed about the causes of balance or imbalance, stability or instability, in the external accounts of the U.S.—and here the future is quite literally the product of the past. What has happened and what is currently happening not only contain the seeds of what may be about to happen but also reveal the areas in which purposeful action can be taken in order to influence what is about to happen. By that criterion, the structure of accounts suggested in the table may be another useful supplement to all that has gone before. For this array of the factors does bring out quite strikingly some of the aberrations that accounted for the superficial strength of 1969, for example, when the U.S. was actually gaining reserves and foreign central banks were reinforcing that gain through the official settlements balance.

On commercial account, as defined in this formulation, the U.S. had by the end of 1969 been in deficit for two years, and that account had actually been declining since 1965 when the Vietnam escalation and the domestic inflation began. Moreover by the end of 1969 the net drain through Government accounts had again reached the high set in 1967. So it was only from the capital account, both the inflows from private investment and those from money market transfers, that the aparent strength came. And much too much of that inflow came through short-term money market swings—the time bomb that has typically threatened so many countries under so many different conditions for generations, but which has attained wholly new dimensions with the emergence of the Eurodollar (and Eurocurrency) market. The implications both for precaution and for action stand out clearly. If the U.S. was not to have heavy pressures on its reserves in 1970 and in 1971, arising from a large additional flow of dollars into the holdings of other central banks, then some combination of several possibilities would have to occur: an imminent reverse flow of short-term money (implied by the unprecedented inflows of 1969) might be slowed down; the net excess of exports over imports might be widened; the net outflows on Government account might be reduced; the large net inflows of private longterm capital might be increased; or foreign commercial users of dollars and central banks might become increasingly eager to hold more dollars for transactions or reserve purposes.

Table 2.—Composition of the Major Components of the U.S. Balance of Payments, 1969 [1]

[Millions of dollars]

I. Private commercial:	
Exports:	
Merchandise, adjusted, excluding military (3)	36,473
Transportation (6)	3,131
Travel (7)	2,058
Other private services (9)	1,753
Imports:	
Merchandise, adjusted, excluding military (15)	–35,835
Transportation (17)	–3,608
Travel (18)	–3,390
Private payments for other services (19)	–709
Unilateral transfers, private remittances (27)	–784
Total	–911
II. Government:	
Transfers under military sales contracts (4)	1,515
Other U.S. Government services (10)	376
Income on U.S. Government assets abroad (13)	932
Military expenditures (16)	–4,850
U.S. Government payments for other services (20)	–710
U.S. Government income payments on foreign assets (22)	–777
Other U.S. Government grants (29)	–1,644
U.S. Government pensions and other transfers (30)	–406
U.S. Government loans and other longterm assets (42)	–3,477
U.S. Government-held foreign currencies and other assets (43)	89
Repayments on U.S. Government credits (44+45)	1,204
Nonmarketable liabilities of U.S. Government (57+58)	97
Total	–7,651
III. Private investment:	
Fees and royalties from direct investments (8)	1,369
Income on private direct investment abroad (11)	5,639
Income on other private assets abroad (12)	2,267
Private payments on foreign investments in U.S. (21)	–3,686
Direct investments abroad (33)	–3,070
Foreign securities newly issued in U.S. (34)	–1,667
Redemptions (35)	478
Other transactions in foreign securities (36)	–305
Longterm bank claims (37)	330
Longterm nonbank claims (39)	–424
Direct investments in U.S. (52)	832
Purchases of U.S. securities other than Treasury issues (53)	3,112
Longterm liabilities reported by U.S. banks (54)	–676
Longterm nonbank liabilities (55)	691
U.S. Treasury marketable or convertible bonds (59)	–167
Total	4,723
IV. Money market:	
Short-term bank claims (38)	–871
Short-term nonbank claims (40)	296
Short-term nonbank liabilities (56)	76
Deposits and money market paper held in U.S. (60)	8,366
Total	7,867
V. Errors and omissions, net (63)	–2,841
VI. Reserve balance (sign reversed):	
Gold (47)	967
SDR (48)	
Convertible currencies (49)	–814
Gold tranche position in IMF (50)	1,034
Total	1,187

[1] Numbers in parentheses refer to the line specifications used in the June 1970 issue of the *Survey of Current Business*.

This is not the place to look beyond, to search for the natural or man-made forces that might effect one or another of these possible results, or to argue for another "balance of payments program." But this is the place to put just enough of the argument to suggest a plausible case for the two principal suggestions advanced in this paper: that the greatest scope for fresh effort in the assembling of data is to be found in the Eurodollar market, and that the greatest scope for new effort in the presentation of data lies in a reordering of the existing components, to focus them on the causes of changes in the reserves of the U.S. itself. That, perhaps it is not too presumptuous to suggest, would be in keeping with the pioneering spirit that has made this country's balance of payments accounting so outstanding throughout the past half-century.

RICHARD and NANCY RUGGLES

38

The Evolution of National Accounts and the National Data Base

During the last half-century, the *Survey of Current Business* has been the vehicle for the development of a comprehensive statistical reporting system about the operation of the U.S. economy. Although economic and social developments over these fifty years have had a major influence in shaping the statistical reporting system, much of the progress which has been achieved can be directly attributed to the ingenuity and sheer hard work of those responsible for reporting on the state of the economy in the *Survey*. During this period, the reporting system has moved from a collection of miscellaneous and largely unrelated time series of economic data to a highly articulated, comprehensive, and integrated body of economic accounts. In part, this evolution reflects expansion in the quantity of data available, greater statistical refinement, and better adaptation of the reporting system to current needs. More important, however, the development of national accounts has both reflected and contributed to major changes in the nature of economic analysis. Most economists today would herald the development of the national economic accounts to describe and analyze the operation of the economic system as one of the greatest achievements of modern economics.

At this fifty-year mark, it is appropriate that we take a backward glance to see just how these changes came about. From such an examination we can learn much about the forces that have shaped the development of the system and the kinds of changes that have been required to adapt it to meet the increasing demands of economic and social policy. Such a retrospective survey will also let us evaluate the responsiveness of the statistical reporting system to changed conditions and the extent to which it was itself a major force in the development of economic thought.

It will also be useful at this half-century mark to ask whether the present system fully meets the demands which are being placed upon it, and what changes should be made to ensure the longrun evolutionary development of the system. This is not a trivial task, since the pressure for widened economic and social action has brought with it information requirements which are different not only in quantity but also in kind from what is now available. The economic reporting system as now presented in the *Survey* can provide the basis for a more comprehensive framework of social and economic data. The question is mainly one of how to relate the national economic accounts more closely to the national data base.

Finally, it is also useful to speculate on the future evolution of economic and social statistical systems and on how the information they provide will affect the development of economic and social analysis. The computer is having a revolutionary impact on data processing, so that the social scientist now has available a completely new technology for solving economic and social problems. This technology has profound implications both for the development of reporting systems for economic and social data and for their use in economic and social analysis.

EVOLUTION OF THE REPORTING SYSTEM

The Great Depression

One of the effects of the Depression of the thirties was a growing concern about the adequacy of the statistical reporting system. The miscellaneous series available at the beginning of the thirties were not comprehensive enough to give a valid report on the state of the economy, and they could not be added up to determine the overall effect of the events taking place. In 1932 the Division of Economic Research in the Department of Commerce, which then prepared the *Survey of*

Current Business, undertook a study of national income, with the cooperation of the National Bureau of Economic Research. The results of this study were reported as Senate Document No. 124 of the 73d Congress, 2d session, entitled *National Income, 1929–32.* Beginning in February 1934, articles on national income were published at irregular intervals in the *Survey.* The initial estimates covered the national income paid out, by type of payment and by industrial division, and the national income produced. For the first time, it was possible to quantify the decline which had taken place in the U.S. economy and to show how this decline affected different industries and different types of payments. A special Income Section—later National Income Section—was created in the Division of Economic Research and given the responsibility for providing annual estimates. By 1938 the pressure for a more current measure of the flow of income was such that the National Income Section initiated estimates of monthly income payments in the U.S. Examination of the *Survey* over these years shows a rapid development in the elaboration of detail and the sophistication of the national income data. As those who were part of the group at that time can testify, it was an exciting and stimulating period.

War Mobilization

The mobilization for World War II had a tremendous impact upon the development of the national income framework. In gathering the Nation's resources for war, it was necessary to know not only the level of economic activity in various industries but also how the income generated by such activity was being used for the purchase of goods and services by consumers, business, and government. Of course, by this time the Keynesian theory of income determination had been well absorbed, and the National Income Unit was well aware of the implications of this theory for the statistical framework. Furthermore, independent work had been done on specific components of final expenditures. In March of 1942 it was all put together, and gross national product was born. Specifically, the gross national expenditure (or product) was shown in terms of government expenditures for goods and services, private gross capital expenditures, and consumer purchases. This added dimension assured the use of national income statistics as the primary tool of national economic policy. Resources were provided for the elaboration and development of such statistics. Ingenious methods were developed to tap a large number of statistical sources and to integrate them into a common framework. Data from the censuses of manufactures and business were used as the basis for commodity flow estimates. Income tax and social security data were used to provide information on income payments. War Production Board data yielded information on Government defense expenditures. In short, World War II mobilized the statistical resources of the Nation.

The demands for national income information generated during the war resulted in the development of the system of national income accounts. In July 1947, a National Income Supplement to the *Survey* was published. For the first time, the system was set forth in terms of systematic, articulated accounts. Some forty-eight statistical tables were provided, all fitting into a set of six national income accounts. Sectors of the economy were explicitly recognized, with accounts for

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businesses, government, households, and the rest of the world. The primary thrust of the national income accounting system, however, was still to show the net contribution of the different sectors to the aggregate national income and the income which each sector received as a result.

Consolidation and Extension, 1947–54

The period from 1947 to 1954 was one of consolidation and extension. The 1954 Supplement to the *Survey*, explaining the data and providing the basic tables, represented a substantial achievement; the sources and methods used in making the estimates were described in considerable detail. This Supplement represents a culmination of the statistical effort which began with World War II.

Restructuring, 1954–65

Following the publication of the 1954 Supplement, there was a period of significant restructuring in both the form and the content of the national income accounts. In the 1958 Supplement to the *Survey*, now called *U.S. Income and Output*, the data were recast into a simpler and cleaner set of national income accounts, which showed more clearly the operation of the different sectors of the economy. In particular, the activity of the government sector was shown in terms of its expenditures by function and object, giving a much clearer picture of the government's role in the economy. It is this version of the national income accounting system which continues to be used at present. Some refinements in definitions were introduced with the benchmark revisions described in the August 1965 *Survey;* the most important of these was the treatment of interest paid by consumers as a transfer rather than as a component of production.

Integrating Related Data, 1963–70

In recent years, the major change in the national income accounts has been their integration with other bodies of data. Input-output data have been integrated with the national income accounts, and input-output tables are now published by the Office of Business Economics. Considerable work has also been done in harmonizing the flow of funds data published by the Federal Reserve Board and the related national income data published in the *Survey*.

A MODEL OF THE ECONOMY

Before the development of the national economic accounts, the national data base was largely unexploited for purposes of economic analysis. By its very nature it was highly fragmented and unintegrated. Although the population and economic censuses and the data collected by the Department of Agriculture and the Bureau of Labor Statistics did serve specific functions, they often remained isolated series which were not related to one another. Administrative statistics such as income tax data, social security data, and government budgets were generally not utilized for economic analysis, despite their importance for reporting on the operation of major elements in the system. What the national economic accounts have achieved is the piecing together of the widely diverse fragments of the national data base into a coherent reporting system. To some degree, the data base has been responsive to this integrating influence, through the adoption of similar classification schemes and improvement in reporting techniques. The most striking change, however, has been the growth of the data base itself, due to the increased collection of basic information and the expansion of government programs. Today more than ever, an integrating framework is needed to provide the basis for putting order into the national data base itself.

De-emphasizing Welfare Measurement

Both the general public and economists have always wanted some overall measure of economic performance and welfare—a barometer which would tell how the economy

is performing, or how general welfare is changing. Thus the original impetus to the development of national income statistics by the Federal Government lay in the desire for some measure of the performance of the economy in the Depression of the thirties. In seeking such a measure, economists have built from the network of transactions a variety of economic constructs: national income paid out, national income produced, gross national product, personal income, etc. The process of estimating these constructs required the generation of estimates of separate components of the totals. Initially, such components were merely steps on the way to the total, but inevitably they became of major interest in their own right. Thus such things as consumption expenditures, government expenditures, capital formation, saving, tax payments, and many other blocks of transactions became important parts of the economic accounting system. Despite the controversies as to whether government services were intermediate or final and the extent to which other costs were intermediate rather than final product, the evolution of the national accounts has been such that more and more economic activity has been covered, and less emphasis has been placed upon the welfare or barometric aspect of the major economic constructs.

Empirical Models of the Economy

The national accounts today provide a statistical replication of the economy, much as an engineer's scale model replicates a particular piece of equipment. In both cases the object is to reflect accurately the features and characteristics of the thing which is being reproduced. In the case of national accounts statistics, the model is not an operating one but rather one which describes the economy at a point of time. To most economists the term "model" implies a system of simultaneous equations, or at least behavioral characteristics, which determines changes over time. Such theoretical models, however, do not generally have the function of describing empirical relationships as they exist for a given point in time. In point of fact, empirical representational models such as national accounts are complementary to the behavioral models.

It is indeed fortunate that the success of the national accounts need not be measured in terms of their ability to measure either welfare or performance. The increasing attention being given to problems such as pollution and the deterioration of the environment accents the deficiencies of a dollar valuation of output as a measure of welfare, nor are per capita income measures all that is needed to attack problems of racial discrimination, crime, and inadequate housing. In terms of performance, technological change reflected in new products, better systems of communications, and other benefits suggest the inadequacies of aggregate measures of real product. But the introduction of arbitrary value judgments to make adjustments or imputations for these factors may confuse fiction with fact and jeopardize the objectivity of the system of reporting. Those who wish to discard the whole national accounting system merely because its aggregate constructs do not provide good barometers misunderstand the function of the accounts. What they do show is how the government allocates its funds, what people spend their money on, what industries grow, how the money income is distributed, and many other things which are directly relevant to the way the economy works and what is taking place.

Just as the businessman needs his accounts to understand the operation of his business, so a nation needs its accounts to understand its operation. Looking at the same set of accounts, different people will draw

different conclusions, based upon their own value judgments and their own interpretation of the meaning of the information. To the extent that the national accounts leave out important information which is needed to understand the operation of the system, they are deficient, but to the extent that they record relevant information faithfully, they can be considered to be successful. Perhaps the most valid charge against the present national accounts is that there are serious omissions of important information which cannot be fitted into the framework of aggregated market transactions.

CHANGES IN THE PRESENT SYSTEM

The present system of national accounts in the U.S. represents a substantial achievement. In completeness, detail, and reliability, the U.S. accounts are second to none. They provide an excellent basis for understanding the operation of the economy. But this does not mean, of course, that we can or should expect the evolution which has been taking place to stop at this point. In the period since the last major revision of the accounts, important changes have taken place both in the demand for information and in the technology of data processing, and these developments suggest that the time has come to consider a number of innovations. Specifically, these innovations fall into three groups: (1) revisions in the definition of major national accounting concepts, (2) changes in the form of the national accounts, and (3) the development of microdata sets to provide for the integration of economic data with social and demographic information.

Revised Accounting Concepts

Intangible Capital Formation

One of the paradoxes of U.S. national accounting concepts is that gross capital formation has been restricted to tangible capital, although output reflects both tangible and intangible goods and services. In this connection it is interesting to note that the Socialist countries which follow the material product system of accounting use consistent definitions of output and capital formation, excluding intangibles from both. Thus the concept of capital formation used in Western countries is identical with the Socialist concept. For both modern industrial economies and less developed countries, however, the inappropriateness of a capital formation concept based solely on tangible capital is becoming increasingly apparent. In industrial economies the role of research and development expenditures by both private enterprises and governments is increasing, and the use of resources for this purpose and their impact upon productivity are becoming more important. The present treatment of research and development expenditures consolidates them out of the accounts as an intermediate product which is embodied in the cost of producing current output. In less developed countries, expenditures in areas such as education, health, and planning are written off as current outlays, whereas expenditures on roads, buildings, airports, and other construction activities are considered to be capital formation. From the point of view of their impact upon future economic development, however, expenditures aimed at creating human and intellectual capital may be fully as important for future growth as expenditures on physical capital, and it may be perfectly legitimate to treat these expenditures as capital outlays and to amortize them over an appropriate period. Similarly, households may undertake to invest in intangible capital. Expenditures for educating children may make a significant contribution to the creation of human capital. For these reasons, it would seem appropriate to broaden the concept of capital formation to include intangible capital.

Government and Consumer Capital Formation

In the U.S. accounts it has also been a tradition to exclude even physical capital formation by either government or households. In most other countries and in the

United Nations system of national accounts government fixed capital formation is measured, but in the U.S. such outlays are considered to be current outlays by the government. It would be useful to reflect government fixed capital formation in the U.S. accounts. Similarly, expenditures on consumer durables such as automobiles, household appliances, furniture, etc., are considered to be current consumption expenditures. Nevertheless, these durables last for a substantial period of time and provide a flow of services over time. It would therefore be useful to treat consumer durables as part of consumer capital formation and to include in current consumption the services of such assets as they accrue to the consumer.

Saving and Investment Accounts

These extensions of the concept of capital formation to include intangibles as well as tangibles and to recognize government and household capital formation would emphasize the desirability of separate saving and investment accounts for enterprises, government, and households, instead of the present consolidated saving and investment account for the economy as a whole. Such a deconsolidation of the saving and investment account, furthermore, would make possible a closer integration of the national income accounts with the flow of funds, and the basis could be laid for the development of national wealth data and the creation of balance sheets for specific sectors of the economy, as has been recommended by various Government committees.

Business Consumption

The concept of consumption also needs attention. The present accounts include consumption by households and by government, but they make no provision for consumption goods and services provided by businesses. Yet businesses do provide consumption goods both to their employees and to the public. In some cases these take the form of fringe benefits or goods and services made available to employees. In other cases they are goods and services provided to the general public for advertising or other purposes. For employees, they may include medical benefits, subsidized cafeterias, entertainment, vacation facilities, travel expenses, etc. For the general public, they include support of mass media such as newspapers, radio, and television, and direct provision of goods and services by enterprises as a part of their public relations effort. It is interesting to note that in countries where radio and television are operated by the government, their cost is included in total output as a part of government expenditures on goods and services. Where, as in the U.S., radio and television are supported by advertising expenditures, however, they are treated as intermediate goods and services which are part of the cost of producing other goods. Although it would be possible to allocate this type of consumption to individuals, a preferable treatment would be to recognize consumption goods provided by business as business consumption, much in the same way that goods and services provided by government are considered to be public consumption.

Changes in the Form of the Accounts

As has been indicated, the present form of the national income accounts has evolved in response to calls for information and out of the development of economics itself. The 1947 national income accounts constituted the first formal presentation of an accounting system for U.S. national income data. The 1958 revision of this system was a major alteration; the accounting structure was cleaned up and the more important flows were shown more clearly. Since 1958 the structure has remained unchanged, although some of the

classifications within the accounts have been altered to provide more relevant information. The time has now come to review the accounting structure again in the light of the changes which have taken place over the last decade and the tasks which the system is now being required to perform.

The Government's need for detailed information on major economic and social problems has increased substantially over the past decade. The Federal Government has become involved in major social programs relating to education, health, and welfare, and there is a pressing need for detailed information on the costs and benefits of specific programs in these areas. The present form of the national accounts does not easily lend itself to providing the kind of detailed data required for such problems. Therefore ad hoc studies of a special nature are made, and the results usually are difficult to tie in with the overall accounts.

A second consideration is that the technology of data processing has changed significantly. Computers are now able to handle very large amounts of data, and as a result it is possible to use information which has until now been buried in the files of administrative and statistical agencies. The present form of national accounts is not ideally suited to integrate such information. The technique of making aggregate estimates on the basis of tabulated data from a large variety of sources is still the basic methodology underlying national accounts estimation. Although this sort of technique is the only way to obtain consistency and comprehensiveness, the accounts should be drawn up so that they can take advantage of the bodies of data which are becoming available in computerized form.

Finally, the methodology of economic research has changed. Much of the earlier development of the national economic accounts went hand in hand with the development of macroeconometric models. These models are designed to explain the behavior of the economic system as a whole in terms of formal econometric relationships among aggregate economic variables. The size and complexity of these models has increased steadily, but often they are still inadequate for analyzing more detailed aspects of economic policy. To an increasing extent economists are turning to the analysis of sample sets of microeconomic data.

Integrating Microdata

Each of these changes emphasizes the need to integrate microdata with macro accounts. Large amounts of microdata now exist, and these data are being used for purposes of economic analysis. The creation of a dual system of macro accounts on the one hand and microdata on the other would indeed be unfortunate—as unfortunate as is the present division between the teaching of the macroeconomics of income determination on the one hand and the microtheory of the firm and the household on the other. What is required is a framework which will encompass both the micro and the macro data, providing us with both a unified system of information and a unified theoretical structure.

Sectoring Principles

The key to this dilemma lies in the system of sectoring which is adopted at the macro level. The sectoring of the national accounts must correspond to identifiable sets of decisionmaking units, each of which may have an income statement and a balance sheet. The principle of disaggregation should ultimately be the separation of sets of reporting

units, rather than the more detailed cross-classification of tabulated information. The use of samples of individual observations is considerably more efficient in reporting complex interrelationships among variables than cross-tabulations of aggregated data. As Richard Stone notes in his discussion of social and demographic accounting systems, a cross-classification of 10 variables each of which has 10 classifications would result in a matrix of 10^{10} cells, i.e., 10 billion (most of which, of course, would be empty). In contrast, 10 pieces of information on every individual in the population of the U.S. would contain only 2 billion elements, and the fineness of classification would be irrelevant, since the individual observations would be preserved. In most instances, of course, economists would prefer information on a sample of the population with a larger set of information on each reporting unit.

Household Sector

The changes in sectoring which would be required in the national accounts to make them compatible with appropriate microdata sets are relatively minor. The most significant change would be in the definition of the household sector, since the personal income and outlay account at the present time includes the transactions not only of individuals and households but also of nonprofit institutions. This classification was based on the contention that such organizations operated with motivations different from those of other enterprises, but the same could be said of government enterprises, and it is questionable whether a private university or hospital which is operated on a nonprofit basis is significantly different from similar institutions which are either government owned or of a private profitmaking nature. If these nonprofit institutions were excluded from the household sector, it would be possible to consider the account for this sector as a consolidated income statement for all households. A sample of households should therefore provide much of the information for the macro account for all households. At the present time, the Office of Business Economics is engaged in constructing such a sample in order to obtain information on income distribution. Aligning the sample with the macro measures of personal income can provide information on income distribution for different types of households, and thus give social and demographic dimensions to income distribution data. Such an underlying sample of microdata would make it possible to subdivide the household sector into subsectors such as retired, unemployed, black, urban, or any other groups for which data are needed.

Enterprise Sector

An enterprise sector should also be created. In some ways such an enterprise sector would resemble the business sector which appeared in the 1947 accounts. In that presentation, however, the major function of this sector was to derive the gross product originating in private business. The coverage of the enterprise sector which is suggested here would be somewhat broader than private business. It would comprehend all enterprises which operate in the market and have the equivalent of income statements and balance sheets. This would include corporations, unincorporated enterprises, government enterprises, and nonprofit institutions. As with the household sector, it would of course be possible to group the various types of establishments in the enterprise sector as subsectors.

Government Sector

The government sector would include the activities of Federal, State, and local governments and of those related agencies which do not operate as enterprises. The subsectoring here would depend upon the administrative and legal organization of the various government bodies. It would be useful for the sectoring to correspond to actual

administrative procedures, so that the national accounts could be directly related to the budgetary documents of the government.

DEVELOPMENT OF MICRODATA SETS

Matrix Presentation

The concept of microdata sets opens up the possibility of developing a comprehensive statistical system in which economic, social, and demographic data can be fully integrated. In recent years there has been considerable discussion of social accounts, conceptually similar to the national economic accounts but providing social and demographic rather than economic information. Unfortunately, however, there is nothing in the social sphere which corresponds to the network of transactions in the economic system. The social and demographic accounting matrices designed to show year-to-year changes proposed to the U.N. by Richard Stone become unwieldy and inflexible when used as a basis for analyzing even relatively simple problems. Such cross-tabulations cannot serve as the basis for an integrated system of economic, social, and demographic data. In contrast, macroeconomic accounts which are integrated with microdata sets can provide for integration of social and demographic data. Thus for example, a sample of households can include data not only on income, assets, and consumer expenditures but also on age, sex, race, education, and occupation of the members of the household; they can even record how the individuals spend their time in different activities. For most social questions, such as discrimination, poverty, education, and health, economic as well as social information is required. For analytic purposes it would not be useful to develop a social information system separate from the economic information system. While it is important to develop overall social measures, they should not exist separately from the basic economic and social accounts. Rather, they should result from summarizing particular aspects of the economic and social accounts in a manner which reflects current social policy concerns. The best hope for useful social indicators, therefore, lies in the use of relevant microdata sets containing both economic and social information.

Reporting Units

The reporting units for which microdata sets are collected may, obviously, be units other than individuals, households, enterprises, firms, or governmental budgetary units. Interest in the environment suggests that cities and regions may be appropriate reporting units. Such data, furthermore, can be directly related to the enterprises and individuals living in the region. Thus by systematically building microdata sets which can be linked at the level of the individual reporting unit, important bodies of information from different sources can be analytically related to one another.

Existing Microdata Sets

Microdata sets are not a project for the remote future; they are here. The Bureau of the Census pioneered in this area in the development of the 1-in-1,000 sample of the 1960 population census. The success of this microdata set for many kinds of economic and social research is attested to by the present plan for developing 1-in-100 public use samples of the 1970 population census; six of these large samples, each containing 2 million cases, are projected. The Internal Revenue Service has also recognized the usefulness of microdata sets. It now uses samples of individual and corporate returns to evaluate the effect of alternative tax proposals and to make revenue estimates. These same tax samples have been used by economists outside the IRS for studying a wide variety of important economic problems. The Social Security Administration has developed samples of its data covering individuals over a period of time. The Office of Economic Opportunity has collected samples designed to give special emphasis to low-income households. Currently, one of these surveys includes a pro-

gram of re-interviewing over 5,000 households for a period of five years; this sample contains over 1,000 pieces of information on each household. Much of the Government's current statistical reporting is also based upon sample collection. The Current Population Survey, which is the main source of data on unemployment, is a monthly sample of households. The Consumer Price Index published by the Bureau of Labor Statistics rests upon a consumer expenditure sample and monthly samples of prices.

New Synthetic Data Sets

The large number of well-defined samples which now exist provide a substantial portion of the national data base. Unfortunately, where these sets of data exist without being integrated into an overall framework, they are of limited usefulness. Thus, for example, the tax data do not cover individuals who do not file income tax returns, and such important information as the age of the individual and the composition of the household is not available from the tax sample. Other samples have other biases and data limitations. In order to create a microdata set which corresponds to a given sector or subsector of the economy, it is necessary to align the sample and to add information from a variety of sources. As the quality and comprehensiveness of different samples improve, this task will become easier. It is quite possible, however, that the national accountant will have to become involved in the task of combining information from different microdata sets so as to provide a new synthetic data set which contains more representative and comprehensive data. Thus, for example, samples on poverty groups can be used to supplement samples of income tax data. The 1-in-100 sample can provide social and demographic information. The fitting together of different samples to provide a common set of information could, in principle, be based either on an exact matching of individuals or a synthetic matching, imputing information for similar reporting units on a probability basis. Since most samples do not include the same individuals, the latter technique will have to be adopted in most instances. The resulting microdata set will therefore present a synthetic sample, with the same statistical properties as the samples from which it was derived, but not containing information on any real individual. Such synthetic microdata sets, therefore, do not present the problem of confidentiality which many fear may result from the wide use of sample data.

The task of generating synthetic microdata sets which embody information from a variety of different sources is not unlike the task which the national accountant has faced in the past, that of piecing together bodies of information from a wide variety of sources to yield estimates for a particular transaction flow in the economy. Just as in the case of the national accounts, once the major outline of the system is established the problem of filling in specific parts becomes much more manageable. What is in fact being proposed is that the model of the economic system which is spelled out by the national accounts be extended to include the detailed microdata sets which describe individuals, enterprises, and government agencies. The development of microdata sets corresponding to the macro accounts will, of course, be a gradual process. Their major function is to provide the detailed economic and social data needed to permit the use of simulation techniques and microanalytic models for the analysis of complex economic and social problems.

The New SNA

The new United Nations system of national accounts was developed specifically to provide for integration of the national economic accounts. It does represent a considerable achievement in this area, but at the same time it is not ideally suited as a framework for microdata sets which contain economic, social, and demographic data. The present U.S. national income accounts are very much closer to what is in fact required, and it would seem highly appropriate that in the next decade they evolve into a full set of economic and social accounts embracing both macro and micro data.

39

WALTER S. SALANT

Past Progress and Future Priorities

That the Office of Business Economics and its predecessor organizations in the Department of Commerce have contributed greatly to the interpretation of economic conditions in the United States is most dramatically seen if one compares early and recent issues of the *Survey of Current Business*. The early issues consisted almost entirely of current business data of the kind then available, mainly relating to prices and, to a lesser extent, to production of major materials and physical distribution of goods, such as pig iron production, coal production, freightcar loadings, and to finance. The *Survey's* text was little more than a verbalization of its tables and charts. It contained little that would now pass for economic interpretation or analysis, although the Department did do pioneering work, mainly in connection with the international transactions of the U.S.

Beginning in the middle thirties, the Department began, under the direction of Robert Nathan, to expand its work on estimates of national income initiated by Simon Kuznets, and it progressively refined them, under the successive directions of Milton Gilbert and George Jaszi, the present Director of the Office of Business Economics, into what is now an articulated and elaborate system of national economic accounts and the most indispensable single tool for economists and analysts of business conditions. It is not too much to say that work on national income developed from a "subject" or "topic" into a discipline, and that the economists at the Department of Commerce were among the pioneers in that development, not only in the U.S. but also in the world. At the same time, Commerce's reporting on current business activity was greatly expanded in scope and improved in quality.

Since World War II, expansion and improvement have continued. OBE has entered new fields. It took over and revived the work of the Bureau of Labor Statistics on interindustry relations (input-output). It developed estimates of the stock of tangible capital, of value added in constant prices by individual industries, expanded its estimates of the components of national income by States and regions, estimated some components for local areas, developed a quarterly economic model of the American economy, improved existing data on current business conditions, and initiated new surveys to expand the scope of such data. This refined and expanded body of material has been presented more analytically, providing the interpretations that were wholly absent from the early issues of the *Survey*. Few articles are now confined to such unsatisfying statements as the fact that this series rose by x percent and that one went down by y percent.

In the international field, perhaps the earliest outstanding work of interpretation by Department economists was *The United States in the World Economy*, by Hal Lary and associates, which reviewed the international transactions of the U.S. and its role in the world economy over the whole interwar period 1919–39.

The great improvement in the quality and scope of data collection and the quantum change from mere reporting of data to sophisticated analysis and interpretation undoubtedly were in large part the result of conceptual advances in the discipline of economics, and especially of the revolution wrought by Keynes in the analysis of what determines the level of output, an advance which provided a conceptual framework into which economic data could be fitted and which is now universally accepted as the one

in which both "Keynesian" and "anti-Keynesian" positions about policy are discussed. These advances could hardly have failed to be complemented by corresponding improvements in the economic work of the Government, but not all such advances can be thus attributed: the degree to which the Department not only kept up with the field but itself contributed to the new economic knowledge has also been notable. In its earlier years Commerce's economists seemed to be far behind the frontiers of their subject, but this is no longer the case. Indeed, under the strong intellectual leadership and high standards of analysis and workmanship of OBE's present Director, the Office has expanded its investigations into the new fields mentioned above.

As far as the domestic economy is concerned, the only area in which progress has not been well maintained is that of the estimation of the distribution of income by size, which was initiated by the late Selma Goldsmith. The method of making such estimates is being reconstructed within the framework of the national income and product accounts. In the international field, OBE has developed annual estimates of the international assets and liabilities of the U.S., of direct investment by the U.S. abroad and by foreigners in the U.S., and of sources and uses of funds by foreign subsidiaries of American companies.

Of greater importance and usefulness than this brief and impressionistic summary of the past and present, however, is recognition of the needs and opportunities for future work and the priorities that should be established among them.

SIZE DISTRIBUTIONS

In research on the domestic economy, the subject that appears to me in greatest need of increased attention from OBE is the distribution of income by size. Suggestions for strengthening the work on this subject were made (along with other suggestions) in the Report of the National Accounts Review Committee under the chairmanship of Raymond W. Goldsmith as long ago as 1957,[1] but little visible attempt has been made to carry them out. I think it especially desirable that efforts be made to estimate the size distribution not only of annual income but of multi-year (e.g., three-year) income of identical families and individuals and to relate the size distribution over these periods to the size distribution of wealth. These data would eliminate, or at least drastically reduce, the misleading effects of sharp short-period changes in the income of households and of unattached individuals, such as occur, for example, when a business, professional, or farm proprietor has a year of abnormally high or low income. Annual data, in reflecting these effects, obliterate the distinction between families whose incomes are chronically low and those whose incomes are low for transitory reasons, a distinction that is highly relevant to measurement of economic welfare.

Also important for measurement of economic welfare are data reflecting the total and liquid asset positions of families of given incomes, since the economic well-being of a family in any year is influenced by the assets on which it can draw in case of need, as well

[1] See *The National Economic Accounts of the United States: Review, Appraisal, and Recommendations*, National Bureau of Economic Research General Series 64 (New York: National Bureau of Economic Research, 1957), ch. 10.

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as by its income in that year. Multiyear and annual data on the time patterns of income of individual families, cross-classified by gross and net total assets and by gross and net liquid assets, appear to me to stand high on the priority list. Some work has been done along these lines, but without the benefit of the resources that a large, skilled, and experienced Government research agency can command.

INTERREGIONAL BALANCES OF PAYMENTS

Another possible area of research, one that calls for a pioneering effort, is the development of interregional payments data comparable to present estimates of the international transactions of the U.S. I believe that such data would be of considerable interest, both for domestic economic analysis and for the light they could throw on the general process of payments adjustment in a highly integrated economy. The regions of the U.S. presumably have substantial surpluses and deficits with one another, but they do not give rise to balance of payments "problems" of concern to policymakers.

We know very little about the reasons for this. Is it because adjustment is more efficient among regions than among nations, so that these deficits and surpluses are more quickly and painlessly eliminated, or are they not really eliminated but merely easily financed? If they are more quickly and painlessly eliminated, is that because labor moves more easily from region to region of the U.S. than from country to country, or is it because the Nation has a central treasury and a fiscal structure that automatically contributes to payments stabilization by changing a region's tax payments in the same direction as its income, and its receipts from Treasury sources (mainly in the form of unemployment benefits) in the opposite direction? Is it because substitution between goods and services produced inside and outside the region is more responsive to given changes in their relative prices and costs than is substitution between domestic and foreign goods and services? Or is it because of movements of longterm securities made possible by the existence of an integrated capital market, as suggested by Tibor Scitovsky,[2] or because some other forces are at work that do not operate as effectively between nations? If deficits and surpluses are really not eliminated but merely financed indefinitely, is that financing made possible and regarded as tolerable by the existence of a common currency controlled by a national central bank?

These possibilities, as well as those that operate internationally, such as changes in relative incomes and costs, are not mutually exclusive, of course. The point is that several factors may be at work and that we know little about their relative importance or even about the extent of potential or actual interregional deficits and surpluses. Answers to these questions may throw light on a number of policy problems. The world economy is becoming more integrated, and this is especially true of the capital markets of the major industrial countries. Countries are talking about—and in some cases actually moving toward—economic integration, including a common currency, so that one may say that groups of countries, and to some degree the entire non-Communist world, are coming more and more to resemble the U.S. Since, at the same time, a growing body of opinion supports a policy of greater flexibility of exchange rates among countries or regions, it would be useful to know why interregional payments within the U.S. do not constitute a problem. That rates of economic growth differ greatly among the

[2] See Tibor Scitovsky in *Money and the Balance of Payments* (Chicago: Rand McNally and Company, 1969).

regions of the U.S. suggests that such information about regional payments would also contribute to our understanding of the implications of growth for international payments.

PRICE DATA AND NATIONAL PRODUCT

Another potential area of investigation, in which some work has already begun, relates to the components of the index of the implicit average price of private output. Changes in that broad index of prices can be broken down into changes in its functional components (compensation of employees, capital consumption allowances, net interest, indirect business taxes, and profits). Quarterly figures for the components of the price of a unit of real gross product originating in all nonfinancial corporations are now published along with the detailed estimates of the national income and product accounts. These data are useful for analyzing the changes in the average price of output of nonfinancial corporations.

Like all averages with current weights, however, these indices of the price of output and of corporate gross product are influenced by shifts in their weights; most of the product components of output or the industry components of corporate product (and, in extreme cases, even all of them) may move in one direction and yet the average may move in the opposite direction. It is true that this result may occur rarely; it is also true that it may be a perfectly acceptable result in connection with some uses of the average; however, it is misleading when one wants the average to summarize the general movements of its components. For that purpose, the difficulty is that one cannot tell from the current-weight average alone the extent to which a given change in it reflects changes in most of its components in the same direction or merely a change in the proportions in which they are combined. In analyses of movements in general price levels, that is important information. For that reason, it would be valuable to disaggregate the estimates of the price index of gross product originating in nonfinancial corporations into indices for the product originating in component industries and to present an index for their aggregate in which the indices for the component industries are combined with constant weights. The implicit price deflator for GNP, which is also affected by shifts in the proportionate distribution of national expenditure, should also be reported on a constant-weight basis.

How much shifts in weights may affect the story that an index tells may be seen by comparing the quarterly changes in three different forms of the GNP price deflator that were presented by the Council of Economic Advisers in its "Second Inflation Alert" (December 1, 1970). According to table 2 of that document, the change in this deflator in the second and third quarters of 1970, measured from the preceding quarters and expressed as annual rates of percentage change, differed greatly for different methods of combining the components, as the following figures show.

Annual Rate of Percentage Change from Preceding Quarter

	2d quarter 1970	3d quarter 1970	Change
Weighted by expenditure in current quarter	4.3	4.6	0.3
Weighted by 1958 expenditure	5.1	4.6	– .2
Weighted by expenditure in preceding quarter	5.0	4.4	– .6

MONTHLY GNP

Efforts along any of these lines might produce a result more valuable than the proposed monthly estimates of gross national product. Early estimates of monthly GNP would necessarily contain errors that would be large in relation to monthly changes in the true figure and might be misleading

enough to raise a question as to whether the estimates themselves add anything of value to the information now provided by monthly data for production, payrolls, and some other variables; revised estimates, which would be made available only some months after preliminary quarterly estimates, would be of only limited interest. The process of making monthly estimates, however, would probably result in improving the quality of the quarterly estimates. I expect that this effect, rather than the monthly estimates themselves, would be the main benefit of this work.

INTERNATIONAL ECONOMICS

In the field of international economics, OBE has devoted most of its energies to estimating the international transactions of the U.S. I have no suggestions concerning collection of data on those transactions beyond those made by the Review Committee for Balance of Payments Statistics in its report to the Bureau of the Budget.[3] I believe, however, that much more econometric and other analytical use could be made of the data. With the theory of international payments in flux, more analysis of this kind is needed. It is admittedly an open question, however, whether much more such work, or any more, should be done by OBE rather than by economists elsewhere. It is certainly possible that if OBE did expand in this area it would cut back on the quality and scope of the data it now provides. If this is the case, its great comparative advantage in data collection suggests that it should leave the more analytical work to others. There are arguments against that conclusion, however: the analytical work may not be done if it is left to others; it should be done by people who have firsthand knowledge of the scope and limitations of the data; OBE can command more resources in manpower and facilities than others.

The articles appearing quarterly in the *Survey* reporting the U.S. balance of payments contain some analysis and interpretation but are primarily "upsy-downsy" in character, resembling the reports of the domestic scene which appeared in the *Survey* decades ago. Perhaps they say nearly as much as can be said with assurance about changes in one quarter; it is difficult to say anything profound about most quarterly changes in the balance of payments because only rarely can one be sure that changes in the more volatile items are significant, and attempts to invest them with deep meaning may be worse than useless. Nevertheless, over longer periods more analysis and interpretation could be presented if a greater research effort were made.

Determinants of Exports

A leading candidate for additional research is the question of what determines U.S. exports of goods and services. OBE's Balance of Payments Division has done some work on this question, but even more is needed. Better understanding of the determinants of U.S. exports is needed not only in forecasting the balance of payments but in forecasting domestic developments through use of OBE's econometric model of the U.S. economy. Forecasts from that model now use a figure for U.S. exports that is obtained by a more or less informed guess at the figure itself, rather than on the basis of explicit analysis of its relationship to developments abroad.

Definition of Payments Surplus

Another aspect of OBE's reporting on international transactions concerns the presentation of figures for the net balance in U.S. international payments, i.e., the surplus or deficit. During the postwar years,

[3] See *The Balance of Payments Statistics of the United States: A Review and Appraisal* (Washington, D.C.: U.S. Government Printing Office, 1965).

the net balance has been defined and redefined in ways sufficiently different to convert what were once regarded as surpluses in a given year into deficits in that same year, without any revision in estimates of the subcategories of transactions themselves. Indeed, Professor Fritz Machlup has listed a bewildering array of different figures that have been used at one time or another by the U.S. Government alone for the net overall balance in the year 1951, which ranged from a surplus of over $3 billion to a deficit of $1 billion.[4] For several years prior to the report of the Review Committee for Balance of Payments Statistics, the Government used the liquidity definition of the net balance. Under that definition, increases in the liquid liabilities of the U.S. to both private and official foreign holders were treated as methods of financing U.S. "payments" (i.e., they were treated as credits below the line) rather than as U.S. "receipts" (credits above the line) that offset U.S. "payments." The Review Committee strongly criticized that definition, as several other experts had already done, and recommended substitution of the "official settlements" (sometimes called the "official reserve transactions") definition. Owing to the continued strong support of the liquidity definition by the then Chief of OBE's Balance of Payments Division, who had made as effective and rational a case for it as could be made, the proposed definition was added to, rather than substituted for, the liquidity definition. While the OBE now gives both definitions in its reports, pride of place and emphasis continued for some time to be given to the liquidity definition. Those responsible for reporting news of international finance for at least two major newspapers, believing that the public would be confused if two figures were mentioned for the net balance, soon took it upon themselves to ignore the official settlements balance in their news stories, thereby helping to give the liquidity definition a new lease on life.

Economists generally recognize that no definition of surplus and deficit in the balance of payments, any more than any other accounting concept, will be suitable for all purposes. The official settlements definition, for example, certainly has its limitations, although some of the criticisms made of it really reflect more the nonsignificance of quarterly changes in the net balance on *any* definition than they do defects inherent in the official settlements concept. It is gratifying that the articles in the *Survey* now recognize that the liquidity definition is a poor indicator of market disequilibrium. Its use as a norm for equilibrium makes increases in foreign holdings of liquid dollar assets that result from increases in foreign private demand for them look like autonomous increases in the supply (in the technical sense of quantity offered at a given price). To those who already understood this, it was not "paradoxical" that in 1969 the dollar was strong in the foreign exchange market at the same time that the liquidity balance was in deficit; indeed, by that definition, the U.S. had been in deficit throughout virtually all of the early postwar period of "dollar shortage."

Economists know that no single definition of the net balance can serve all purposes. While laymen may complain that the use of more than one definition is confusing, the belief that they understand the implications of the international economic position of the U.S. better if only one is used is an illusion. It is better for them to be aware that they do not understand it than for them to assume that they do and jump to conclusions that are likely to be incorrect. For that reason, I do not think any effort should be made to select a single "best" definition. Indeed, some economists who have thought deeply

[4] Fritz Machlup, "The Mysterious Numbers Game of Balance-of-Payments Statistics" in *International Payments, Debts, and Gold* (New York: Charles Scribner's Sons, 1964), table VII-2.

about the problem suggest that it would be better to abandon the publication of any figure for a deficit or surplus, simply showing all the debit and credit transactions (as the *Survey* now does in table 1 of its quarterly articles reporting this country's international transactions), but including enough detail about changes in U.S. liabilities to foreigners (such as is now shown in table 3) to enable readers to construct whatever variant of a net balance they wish. I regard this suggestion as acceptable in principle. Since it appears inevitable that readers will insist on calculating one or another variant for themselves, however, I regard publication of a variety of net balances by OBE as an arithmetical service that it should continue to provide. What is more important for substantive understanding is analysis of the relation between various definitions of the net balance and the strength of the dollar in the foreign exchange market. I would include such research in my list of analytical work that should be performed.

Full-Employment Goods and Services

It would also be desirable, in determining the impact of the rest of the world on the U.S. economy, for the Government's economic advisers to have available estimates of the net balance on goods and services at noninflationary full-employment levels. Increases in the actual net balance on goods and services are commonly regarded as stimulating to the domestic economy, but that view is correct only when they result from an expansion of exports or a decrease in imports that is not induced by a decrease in total income or spending by residents of the U.S. In this respect, the net international balance is similar to the net balance in the Government's budget. A distinction between changes in Government revenues and expenditures that do and those that do not result from changes of income and output has been found necessary for clear thinking, since autonomous changes have independent and positive effects on aggregate demand, whereas changes induced by fluctuations in income and expenditure merely cushion the effects of those fluctuations. This distinction has been made useful in practice by quantitative estimates of the "full-employment budget." Just as that budget takes Government revenue at its estimated noninflationary high-employment values, so that changes in it approximate autonomous fiscal changes, the high-employment balance on goods and services would include imports of goods and services at their estimated noninflationary high-employment values, thereby eliminating induced changes and permitting a better appraisal of autonomous changes in the net balance on goods and services.

International Investment

Probably the most important possibilities for research by OBE in the international field lie in the field of international investment in the broadest sense, including the level and changes in the stock of international holdings of money. This priority reflects two developments. The first is the great increase, since the late fifties, in the mobility and the actual movement of capital and credit between countries. The second is the new and growing emphasis in theoretical and empirical work on a balance sheet approach, which emphasizes the composition of assets and liabilities. From this point of view, investment flows appear as a combination of (a) adjustments in stocks of assets and liabilities to changes in the variables that determine their desired composition and (b) changes of such stocks in response to the growth of total wealth, given the levels of the variables that determine the desired composition of the constituents of that wealth. This "portfolio" approach has important implications for the theory and policy of international payments.

That the conventional theory of this subject needs revision has long been evident to those economists who have observed that, while it can explain movements of net international balances on goods and services in relation to changes in domestic and foreign incomes, it cannot explain adequately movements in total net international balances, i.e.,

combined net balances on goods, services, and capital flows. Historical evidence shows that, for countries with large stocks of capital or a large demand for it, changes in net exports of goods and services have often been not only offset but more than offset by movements of capital across their borders. As a result, net balances on goods and services and total net balances often move in opposite directions, increases in net exports (or decreases in net imports) of goods and services being accompanied by decreases in reserves and decreases in net exports being accompanied by increases in reserves. This phenomenon has been interpreted by some leading economists as a reflection of the effects of growth on the stock-demand for one component of portfolios: money. While these relationships have not been systematically reviewed for many countries and for many periods of time, enough individual countries and periods have been studied to make clear that analysis of the determinants of capital flows presents a vast field for further exploration. That the portfolio adjustment approach to capital flows is regarded as promising is indicated by its use in many of the contributions to a forthcoming volume of conference papers, *The International Mobility and Movement of Capital* (to be published by the National Bureau of Economic Research). Quantitative work using this approach will require a substantial improvement in data on international holdings of assets and liabilities. For the collection and sound presentation of such data for the U.S., reliance must be placed almost entirely on the Office of Business Economics.

OBE has already made a good beginning: for example, its data on direct investment, collected since it conducted a census of such investment in 1957, include annual information not only on the amount of such investment but also on all sources and uses of funds and on the sales of foreign affiliates of U.S. companies. For census years, OBE also reports the labor payments of those affiliates. Data have also been collected and published on the exports of direct investors and on the imports of their foreign affiliates, distinguishing imports from their U.S. parents and from other U.S. companies, for the years 1963–67. (Lack of funds prevented collection of these data for 1968 and 1969.) These data are potentially very useful, and gathering them was a new and imaginative departure. Even with these data, however, would-be users have several problems. One is that the lag between collection and publication is too great: the first results of the 1966 Census of Direct Investment are only now about to appear, more than four years after the end of the year to which they pertain; the rest of the census figures are not expected until mid-1972. This lag results partly from the fact that OBE did not get all the returns until the summer of 1968, but lack of sufficient funds for processing them apparently was also responsible.

Another problem for those who are doing research on foreign investment has been difficulty in obtaining access to the data on direct investment collected by the Balance of Payments Division. A good deal of the problem has evidently been caused by lack of resources. The law requires that the reports of individual companies be kept confidential. To screen tabulations of combined company data to prevent accidental disclosure of individual company data is a time-consuming task. In addition, substantial staff time is required to explain the files to research workers and to prepare the data for their use.

In order to deal with these difficulties, the Division is seeking funds to computerize the files. This will reduce sharply the costs of screening the tabulations and of making the files accessible to users.

If these plans are carried out, the problem of access to data should be largely solved. If, at the same time, the data on the international asset and liability position of the U.S. are improved, the groundwork will have been laid for a substantial improvement in our understanding of the economic and financial interrelationships between the U.S. and the rest of the world.

PAUL A. SAMUELSON

40

Income Distribution: Theories and Facts

It was S. Tucker who said, "I've been rich; I've been poor. Believe me rich is better." For one like myself who lived as an economist in the age before we had decent national income statistics and who now lives in the age in which we have accurate data on GNP aggregates and their breakdowns, it is hard to overemphasize the difference that availability of such data makes.

Therefore, when I occasionally hear a student say, "I hate GNP—to me it is gross national pollution, and I wish the GNP would halve," I shake my head in pity. For one thing, involved here is a fallacy of misplaced identification: shooting the messengers who bring bad news is a policy calculated to promote only ignorance, not joy. If pollution is one's concern—and I must confess it is my concern—only when we have accurate data on aggregate real output can one hope to find answers to vital questions like the following: how much environmental deterioration can be prevented merely by zero population growth, as against that which is attributable to increased per capita living standards? Is Dr. Herman Miller of the Census right in thinking that the respective fractions are about one-third and two-thirds? How can the student and I begin to answer such a question without data on aggregate production and output? I realize that there are wags or idiots who think that Switzerland had no balance of payments problem, and could have had none, back in the days of innocence when she had no balance of payments statistics, but I think the point is clear that, both for those who value material growth and those who deplore it, accurate data are indispensable.

There was a time when we had no censuses of population. Learned scholars could argue over whether or not the population of England declined or stayed the same between the Glorious Revolution of 1688 and 1775. (Actually, it grew.) There is really nothing more pathetic to witness than a polemic between scholars none of whom have any straw out of which to manufacture their theoretical bricks. It is like hearing tots in the play yard scream: "I hate you twice as much as you hate me." "No you don't." Children at least outgrow their childishness.

REAL WAGES

Let me be in fashion, i.e., be relevant. One of the most important aspects of Marx's *Das Kapital* and related writings was the formulation of significant hypotheses about the laws of motion of capitalism. If such hypotheses are to represent more than wishful thinking or irrefutable tautologies, they must in principle be capable of being refuted or corroborated by the facts of experience. Let us consider the very heartland of the Marxian economic model—the labor theory of value, with an elaborated theory of exploitation by capitalists of the workers' product in the form of surplus value over and above the minimum cost of production or reproduction of labor power itself. This is intended as more than a mumbo jumbo to serve as an alternative to the bourgeois theories of Ricardo and John Stuart Mill. From this analysis, Marx believed he could scientifically infer implications for the future—as, for example, the law of immiseration of the working classes.

One can put matters to the test: was there discernible, in the century after the publication of the first volume of *Das Kapital* in 1867, a tendency toward a decline in real wages or at least a stagnation thereof? Without good aggregate economic data, one could only shadowbox over the answer to such a question. "Population has gone up." "No, it has gone down." "Real wages have fallen." "No, they have risen." "You only say that because you are a lackey of capitalism, an apologist for private property." "Only a subversive revolutionist or diseased mind could

make such nonsensical statements." Round and round it goes, and where it stops—in the absence of factual data, on whose method of collection and margin of inaccuracy a jury of informed scholars can agree—no reasonable person ought to care.

INCOME INEQUALITY

Take the problem of the distribution of income. Is it the case that the rich are getting richer, the poor poorer? Is it the case that competitive laissez faire leads ultimately to the destruction of privilege and a state of comparative egalitarianism? These are questions of fact that can be illuminated only by careful empirical studies, in which scholars of all persuasions can review and reperform and audit the calculations made and the conclusions inferred. Facts free us from the need to make *ad hominem* judgments. Was Vilfredo Pareto a Fascist? Perhaps he was (at least he accepted, in his old age, a senatorship from Mussolini). But—in the presence of data—that need not affect the contribution he made to our understanding of inequality by virtue of his discovery that the tails of income distributions tend to be much fatter than those for normal Gaussian distributions. I have heard it said that Corrado Gini had the evil eye. But that does not undermine the validity and relevance of the Gini measure of dispersion as a description of Lorenz curve inequalities of income or wealth. The fact that Marx was an anti-Semite, fathered an illegitimate child, suffered from carbuncles, liked Dickens and Beethoven, and disliked Malthus has relevance to whether one should have him in the local golf club but matters not at all to one perusing his writings for insight into the development of the economic system if empirical data are at hand.

One wishes our knowledge of the size distribution of income and of wealth were more complete. But the data are sufficiently reliable to tell us that inequality tends to be a bit less marked in the advanced mixed economies than in the developing nations; it tends to be less in Israel, the Netherlands, and Sweden than in Britain or the U.S. Within the U.S. inequality may have increased in the decades prior to 1929 and on into the Depression years. Apparently, in the period of World War II inequality declined. However, Dr. Miller and other scholars can discern no clear-cut tendency since 1945 for the respective shares of the highest and the lowest fifth of the population to trend either downward or upward. To state such a fact is not to approve of it, but the persistent absence of such a trend may suggest to one eager to further equality that spontaneous changes are not likely and that contrived change may require action that will not come easy.

Having expressed my appreciation of the light that good national income data can shed on the recent past, I must keep in mind that this is a dynamic and growing frontier for research. True, thanks to these data, among other things, the Allied Powers managed to mobilize their resources in the struggle against Germany more effectively than that country mobilized its economic resources. This we know from the captured files of Speer and others, which surprised us by showing how much Hitler's anti-intellectualism had harmed his own cause. True, developments of input-output by Leontief, Chenery, and others have been found to be useful extensions of GNP data which help Western nations, the Soviet Union, and some of the developing countries plan their economies better.

Still, much more remains to be done. Here are a few random speculations relating to income distribution that come to mind. If individuals and families were followed on a lifetime basis, what changes if any, would be found in income inequality? Another topic,

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which is fashionable today, is the role of investment in human beings through training and education.

RETURN ON HUMAN CAPITAL

Theodore Schultz, Gary Becker, Richard Eckaus, and many others have revived the 1936 notions of J. Raymond Walsh (who deserves a better fate than to be remembered merely for being one-half of the Walsh-Sweezy incident at Harvard) about "the capital concept as applied to man." I say this is a fashion, and conscience requires me to add that it has become something of a fad. This is a euphemistic way of saying that my sampling of the estimates that are current concerning the allegedly large role of education in adding to earning power leaves me with the distinct impression that the yields claimed for high school and college educations, as such, in adding to ability to produce GNP are based on the high side. Only educators, you might say, could come up with such patent and selfserving flattery.

This suspicion of mine, which I have nurtured from the beginning of the current revival, was originally based on the realization that it is very hard to separate the certifying and selecting function of education from what it adds. A Harvard Business School diploma may add to a chap's earnings because it shows he works harder than the mob, or it may merely reflect the fact that the members of the elite, who will have high earnings for reasons of status or genetics, are the ones who get into the Harvard Business School. The statistics simply will not enable us to know whether identification bias is 10 percent, 50 percent, or 90 percent. This original suspicion has been heightened by the findings of the Coleman Report that the relationship between money spent on schooling and performance is a complex one. I find both conservatives, like Banfield of Harvard, and radicals, like Bowles, Gintis, and others at Harvard who proudly wear that label, at one in the belief that schooling adds to the performance only of middle-class-oriented groups of the population, and even this only when we define "performance" in certain traditional ways.

But let us suppose that we were somehow able to get rid of identification bias, and could isolate that part of earning power which is due to capital investment. How might we come to redefine the components of national income? Here are a few speculations and queries.

THE LABOR SHARE

The labor share in national income is allegedly a great constant—thus holds the interesting law of Bowley. If we look more minutely for divergences from constancy, most observers seem to discern, if anything, a slight tendency for the labor share to rise through time. Three-quarters for labor and one-quarter for property is a common breakdown (as, for example, in the Paul Douglas and Robert Solow statistical exercises). But,

as Kuznets has pointed out, much of the income of unincorporated enterprise (and some of the income of small corporations) is really a wage return to farmowners and professional men such as doctors, lawyers, dentists, accountants, and plumbers. So the share of labor is sometimes raised to 80 percent. But the very mention of doctors reminds us that a long training period, expensive education, and forgone earnings are needed to make a qualified M.D. So some important part of the 80 percent has to be subtracted in order to arrive at true labor income, purified of interest return from capital invested in human beings. How large a fraction might be left? Seventy percent? Thirty percent? The answer would of course have to depend upon what our bias-free estimate had turned up for the marginal returns to different kinds of education.

However, even if we were in agreement on these marginal or incremental identifications, it is not clear from what base we ought to measure capital returns of labor versus labor returns. Surely expenses at night school to learn accounting ought to be subtracted. But should we subtract third-grade expenditures to learn short division? And now that the Coleman Report has suggested to its critics that one must look back to the earliest years of infancy for the sources of disadvantages in the learning process, should the forgone salary of the mother who stays at home to read to her child from the King James version of the Bible be debited against his future royalties as a best-selling author? Obviously one could get most of the national income into a nonwage category by such a decision. If as a definition of wages one were left with only that which might under ideal conditions be identified as the "rent" to original genetic ability, analogous to Ricardo's pure rent as the return to "the original, inexhaustible, unaugmentable gift of nature," what Henry George or John Locke, what Shockley or Jensen can we rely on to certify the finding for us?

At the rarified level of economic theory, similar issues can arise. It is well known that a neoclassical two-sector growth model, in which labor grows exponentially and in which some fraction of profits is saved, works best when the capital goods industries are more labor intensive than the consumer goods industries. Some years ago, when Tibor Scitovsky reported before the National Bureau on the matter, he found that using Census data classifications one found almost the same intensities for the two categories of industry and that, in any case, the capital goods sector did seem more labor intensive in the manner desired for stability. When I pointed out this finding to a graduate student, he asked reasonably: "Yes, but if laborers in the machine tool industries are more highly skilled, then counting their training as capital might reverse the finding." And indeed it might. Perhaps in the future we shall receive every month from our friends in Washington accurate data on these and many other matters. When new answers are in the offing, we shall learn to ask new questions.

41

RAYMOND J. SAULNIER

Faster, Better, and Clearer Data

EXPANDED WEEKLY SERIES

We need more data on a weekly basis. The fact that such series are difficult to adjust for seasonality constitutes a formidable problem, of course, but the charts we now have for retail sales and (from private sources) for freight and truck loadings would suffice to make year-over-year comparisons. As it stands, there is at times a lag of two months, even on data we regard as current; for anyone trying to keep up to date on business conditions this is a serious matter.

On a related point, would it be possible to have materials now published in *Business Statistics*, the weekly supplement to the *Survey*, divided between weekly and monthly data and published separately, with appropriate charts? If this were done, I would hope that as many monthly series as possible could eventually be put on a weekly basis. I forecast a very large audience for an expanded "weekly data supplement."

LABOR COSTS AND PRODUCTIVITY

Although this is not directly Department of Commerce business, we cannot get along safely much longer without more full monthly data on labor costs and productivity. The quarterly data on total compensation, output per manhour, and prices (the GNP deflator) now published are enormously useful, of course, but we need them available on a more frequent basis. *Business Conditions Digest*, for example, is seriously deficient in this respect. (Of course, labor costs must represent total payroll and fringe benefit costs, not merely the wage or salary payments now so widely reported—these are of rapidly decreasing interest.) We also need better reporting of new labor contracts.

FINANCIAL DATA

Although this too is outside the traditional scope of Commerce Department responsibility, we need a strengthening of financial statistics. As I see the financial system operating, structural changes have made many traditional monetary aggregates, most notable of which are the figures on money supply and credit outstanding, quite obsolete. For example, we had a near-crisis in financial markets in May 1971 in which commercial paper and Eurodollars played a major role; on neither of these factors—certainly not on

Eurodollars—did we have adequate statistics, and, to date, information on commercial paper and Eurodollars has not been adequately incorporated into the traditional series.

On another set of financial statistics, the commitments to extend credit that financial institutions have outstanding, we have virtually no organized information. I know that a "commitment" is difficult to define, but we have a great and pressing need for loan commitment data for commercial banks, life insurance companies, mutual savings banks, and savings and loan associations.

Finally, I hope that the increasing amount of information available on financial flows will, to whatever extent possible, be put on a weekly basis (for example, data on the net flow of funds into thrift institutions), be made more readily usable (the figures are now so voluminous and so arcanely denominated that they can be used only by a few professionals), and be linked more closely with the national income and product accounts.

HOUSING STATISTICS

We need better and more frequently available data on repair, improvement, and rehabilitation expenditures as distinguished from expenditures for new construction, and we need to combine in a more satisfactory way data on mobile home production with conventional data on housing starts.

NEW COMPENDIA

To speak now of two areas distinctly within the province of the Commerce Department, I would propose separate compendia of data on consumer durable goods and on business investment expenditures, comparable to what we now have for defense spending. The planning of such collections would almost certainly inspire efforts to fill the data gaps still remaining.

BUSINESS CONDITIONS DIGEST

Finally, although I am a regular and enormously grateful user of the *Digest,* I still find it difficult to locate quickly the materials in it. It has a table of contents and an index, to be sure, but the fact that series are combined in several different ways (by groups of indicators, by certain functional groupings, and in analytical groupings) makes the collection awkward to use. There must be a handier way to arrange the figures.

I hope that these suggestions will not obscure the fact that I am deeply grateful—as is the whole economic fraternity—for the fact that, owing to your efforts and those of your associates and predecessors, the task now is only to improve upon a tremendously impressive and useful body of information.

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JOSEPH R. SLEVIN

42

Making News at OBE

The Office of Business Economics makes news, and that tells you something about its importance. It doesn't try to make news. That is not OBE's job. But it works up and puts out numbers and interpretations that people want to know about. Willy-nilly, OBE is a newsmaker. Sometimes the news is in a *Survey of Current Business* analysis. More often it is in one of the press releases that OBE distributes just as soon as a set of figures is ready or just before the full text of a thoroughgoing *Survey* article is published.

A NONPARTISAN NEWSMAKER

OBE plays it straight. It has the respect of the people who write the news that it makes. It does not season its reports to suit the political taste of the party in power. It is honest and highly professional, and that makes things a little easier and more pleasant for economic reporters: they can concentrate on what OBE said instead of trying to figure out why OBE said it.

Critics of newspapers like to complain that they write mostly about bad news and rarely about good news, that conflicts and disasters get the biggest play. It isn't an accurate criticism, but a free press, fortunately, does spotlight troubles and difficulties, and OBE's reports have been getting more attention than they otherwise might, as a result. A riproaring inflationary upsurge is Page One news but stable prices are not; 6 percent unemployment is Page One news but another pleasant month at 3.5 percent is not. OBE doesn't put out either the price or job reports: "another agency," as the networks would say, does that. But OBE *does* benefit from the national concern that inflation and unemployment have aroused. And OBE *is* responsible for the biggest barometer of them all, the gross national product reports that tell the country whether the economy is growing or declining, whether national economic activity is rising or receding.

Unhappy events are not the only cause of the increased interest that attaches to OBE reports. Public concern about the economy has grown tremendously during the past quarter-century. We are committed to achieving the Employment Act goals of maximum production, employment, and purchasing power. In the U.S., as throughout the free industrial world, prosperity and full employment are goals that no Government can ignore and still survive.

FROM OBE TO ONE?

While the Bureau of Labor Statistics, that "other agency" which puts out the wage, price, and employment information, may not like it, I would suggest that OBE is misnamed.

Instead of Office of Business Economics, it might better be called Office of National Economics. True, it collects, compiles, and analyzes vast quantities of business statistics. But it uses other important numbers that are not "business statistics." The main interest that attaches to its most important reports is not what they tell about business but what they reveal about the national economy.

You often can read about the OBE quarterly plant and equipment survey on the front page of your daily newspaper; it is an eagerly awaited report. But it is on Page One rather than the financial page not because there is a powerful national thirst for the latest word about business capital goods plans and not because there is widespread public interest in the machine tool builders or construction. It is there because business capital spending plans shed revealing light on the course that the national economy will be following. Is economic activity going to be rising? Will it be climbing at too fast a pace or too sluggish a pace? Will we have overheating? Will there be jobs for those who want to work?

The same point applies to OBE's reports on personal income, corporate profits, and business sales and inventories. They contain invaluable information for the businessman and the economic analyst. But that is not why they make important news. The quarterly balance of payments reports contain a wealth of fascinating detail, but, again, their great interest lies in what they show about this country's international economic and financial position.

If the Office of Business Economics were to be renamed the Office of National Economics, its designation would change from OBE to ONE—and for this agency of facts, figures, and notably sound analysis that would seem to be a singularly fitting acronym.

Joseph R. Slevin is National Economic Columnist, Newsday.

LAZARE TEPER

43

A History of the Survey of Current Business

The fifty years since the *Survey of Current Business* first appeared have witnessed an unprecedented development and growing sophistication in the Nation's system of statistical intelligence. Beginning as a compilation of some of the basic data originating from many sources, and including, at a later date, analysis of national economic developments, the *Survey* has mirrored this evolution. Its very existence has stimulated statistical inquiry and spurred data development. Though originally designed to serve the business community, it has become important to everyone concerned with developments in the American economy.

1921: STEPCHILD OF COMMERCE REPORTS

By present-day standards, the early issues of the *Survey* were modest indeed, and it is easy to find fault with the data then published. But the choice was limited and the know-how not as extensive as now. There was no compendium of current statistical information on business conditions, which is probably why William M. Steuart, then Director of the Bureau of the Census, initiated in the latter part of fiscal 1921 "the work of compiling statistics for monthly report to show the current trends of business and industry throughout the country" in the belief that such a report would "be very useful to the business public and in some measure furnish information which will help to stabilize industry." [1]

There must have been some doubts about the new publication. Its first issue, dated July 1, 1921, was issued gratis in and out of Government as a supplement to *Commerce Reports* [2] and was not even numbered. It met with a good response, however. The August 1 issue was then assigned Number 1 and was distributed free to all regular subscribers of *Commerce Reports* with an invitation to subscribe at one dollar per year "in order that the publication shall impose no cost upon the taxpayers." [3] The new journal was described as "compiled by the Bureau of the Census, the Bureau of Foreign and Domestic Commerce and the Bureau of Standards, most of the work being done by the first-named bureau." [4] It remained a Census publication until June 1930, when it was transferred to the Division of Statistical Research in the Bureau of Foreign and Domestic Commerce (BFDC) together with its staff and facilities.[5] Not until after the December 1945 reorganization in the Department of Commerce were the *Survey*'s fortunes lodged in the Office of Business Economics.[6]

1921–1930: STIMULATING NEW DATA

Expanded Commodity Data

The very publication of the *Survey* stimulated compilation of new data. "Prior to July 1921," reported the Director of the Bureau of the Census, "the only statistics of this character collected by the [Census] bureau related to the production, consumption,

[1] *Ninth Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1921), p. 44.

[2] Then a daily, *Commerce Reports* published trade and consular reports mostly bearing on foreign trade. In its own words, it was at the time "a rather unsystematized mass of important reports" (issue of August 23, 1921, p. 948).

[3] *Ibid.*, September 26, 1921.

[4] *Tenth Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1922), p. 132.

[5] *Eighteenth Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1930), p. 144. This Division subsequently underwent several transformations and changes of name.

[6] At that time OBE was established within BFDC. OBE was established as a primary organization of the Department on December 1, 1953, and BFDC ceased to exist (Secretary of Commerce, Departmental Order 15 Pursuant to Authority of Reorganization Plan 5 of 1950). Though OBE was solely responsible for the *Survey*, the credit line on its front cover listed only BFDC through December 1949. From January through May 1950, OBE alone was listed, though from June through May 1952 both BFDC and OBE received the listing. Beginning in June of that year, however, OBE alone was listed. (The discussion of the politics of credit lines belongs elsewhere.)

and stocks of cotton, stocks of tobacco and the consumption and stocks of animal and vegetable oils and fats. By the close of the year this service had been extended so as to show for nearly all the principal basic commodities, the monthly production, stocks, unfilled orders, sales, prices, imports and exports, and also such business indicators as bank clearings, freight carried, business failures, and other factors usually considered in determining the policies to be followed in business transactions."[7] To this end, data were tapped from every possible source in and out of Government.

More Representative Data

Bringing current statistics into the open via the *Survey* helped to stimulate interest in better data. In a number of cases, where previously published series compiled by trade associations were not fully representative, they were replaced by information derived from broader surveys conducted by the Bureau of the Census "so as to cover all or substantially all of the establishments, thus perfecting the statistics and making them more representative."[8] Similarly, when data were totally lacking for a given industry, the Bureau of the Census began collecting statistics directly "at the request of a representative number of firms in the industry concerned, and only upon receipt of their promise to report the data promptly."[9] Proper sampling was still a thing of the future, but the foundation for a more comprehensive system was nonetheless laid down.

Cautious Confidence

Looking backward, it is interesting to contrast the spirit of confidence that the early makers of the *Survey* exhibited with the aura of caution that they exuded. In preparing the data for the *Survey*, the reader was assured, "every effort is made to assure accuracy and completeness" even though "timeliness is often of more value than extreme accuracy." The use of "preliminary figures or advance estimates in order to avoid too great a delay in publication" was thus justified. Since some data were collected by outside agencies, the reader was told that the Department of Commerce "assumes no responsibility for their accurateness and completeness." But the temptation was great to reassure him: "The figures used, however, are in some cases those generally accepted in business circles as sufficiently complete to represent the current trend of the given industrial movement, and in other instances are vouched [for] by the trade associations."[10] Quite a contrast with present-day attitudes about the goodness of data! But then the typical user of data was much less sophisticated than he is now. He even had to be told why some figures were offered in an index number form (to "enable the reader to see at a glance the general upward or downward tendency of a movement, which cannot so easily be grasped from actual figures") and why no seasonal adjustments were made ("it was thought better to let this fact show in the relative figures themselves").[11]

1930–1935: THE GREAT SLUMP

Discontinued Series

The number of statistical series published by the *Survey* rose from 501 in the first issue (inclusive of the double-counted 225 series

[7] *Eleventh Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1923), p. 85.

[8] *Ibid.*, p. 86.

[9] *Fourteenth Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1926), p. 85.

[10] *Survey of Current Business*, July 1, 1921, August 1, 1921.

[11] *Ibid.*

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presented in both absolute and index number form)[12] to some 2,000 in 1931,[13] of which 782 dealt with production, shipments, stocks, orders, and sales of specific commodities.[14] The Great Depression crippled the development of statistics as it did business activity and employment. Trade associations, meeting with budget difficulties, were forced to curtail their statistical work, as were Government agencies. Willard L. Thorp found that from calendar 1932 through 1935 the publication of 176 specific commodity series by the *Survey* had been discontinued, with only some 75 series added. Actually, "many series, while still existing, have been so modified or revised as to break the direct comparability with earlier years." Admittedly, the quality of some data was improved and the discontinued series were at times of "little importance," said Thorp, but the deterioration in the Nation's statistical system was serious. Even the growing demand for data to meet the administrative requirements of the National Industrial Recovery Act did not turn the tide. If anything, he suggested, it may have stimulated added resistance to statistical inquiry on the part of the business community.[15]

Promiscuous Statistics

Writing at about the same time, Elmer C. Bratt found that although "the most valuable single source of monthly data is *Survey of Current Business*," the state of statistics, despite the increase in data collection after World War I, "has been a particularly promiscuous affair": samples are "collected in a promiscuous fashion," and only in a few instances is it known "precisely how they were obtained or what proportion of the complete universe is included." Data are not always assembled on the basis of "their utility in interpreting general business conditions." As a result, said Bratt, many of the series in the *Survey* are "of little value," while "several very valuable series" are not carried there.[16] It was not until World War II that a renewed recognition of the need for a comprehensive system of statistical intelligence was developed, even though constraints were placed on the publication of data of strategic significance, but World War I and its aftermath did lay the foundation for renewed statistical activity both in methodology and data collection, and as better statistics were developed they found their way into the pages of the *Survey*.

NEW DIMENSIONS TO THE *SURVEY*

Aside from changes in the nature of the statistical series encompassed in the *Survey*, it evolved in other respects as well. Admittedly, the earliest issues were confined to statistics, but it was not long before interpretative text became a regular feature.[17] These

[12] However, the *Annual Report* of the Secretary of Commerce for 1926 asserts that the *Survey* started "with 200 items" (p. 24). It is not clear what was meant by an "item."

[13] *Nineteenth Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1931), p. 24.

[14] Willard L. Thorp, "Wanted—Industrial Statistics," *Journal of the American Statistical Association*, March 1936, p. 47f.

[15] *Ibid.*, pp. 49ff.

[16] Elmer C. Bratt, *Business Cycles and Forecasting* (Chicago: Business Publications, Inc., 1937), pp. 322f.

[17] The earliest commentary on statistical data in the *Survey* appeared in its November 1, 1921, issue.

analyses gradually expanded and, beginning in January 1931, together with diagrams, were programed at 25 pages per issue. At the same time, a new dimension began to permeate the pages of the *Survey* as comprehensive estimates of the Nation's output in the form of the national income and product series were developed. This early work was in response to a 1932 Senate resolution which called for the development of measures of the national income, its industrial origin, and its distribution in the form of wages, profits, and other types of payments.[18] As the work expanded, a separate National Income Division was established in fiscal 1940.[19]

The first special article published in the *Survey* appeared in February 1934 and summarized the results of its first study of national income.[20] It was a precursor of articles in the next three issues that dealt, respectively, with a new, seasonally adjusted index of variety store sales, an index of sales of new passenger cars, and an index of cash income from farm marketings. No articles appeared in the next three months, but beginning in September 1934 special articles began to appear monthly on a regular schedule.[21] Their scope became broader and broader, reflecting the wide spectrum of research activity of OBE and its predecessors. Where the *Survey* originally devoted itself primarily to republication of statistical series—currently numbering around 2,500—it evolved into a scholarly journal devoted to the exploration and charting of the many facets of the Nation's economy, further enriched by special supplements on national income and product, input-output analysis, U.S. investments abroad and foreign investments here, and a statistical supplement providing historical data and background information on individual series. More recently, though not properly a supplement to the *Survey*, OBE offered information on personal incomes by county and for 223 metropolitan areas for selected years since 1929 on magnetic tapes, punch cards, or printouts; it also offered magnetic tapes detailing the input-output structure of the American economy, a natural development in the extension of its service to the analysis of the contemporary economic scene.

STATISTICAL GOALS

Although these are real accomplishments, much remains to be done. The future programs for the *Survey* are intimately tied up with the further development of the national statistical system, whether the data in question originate in the public or the private sector (though it is unquestionable that the trend is towards the gathering of increasingly more comprehensive statistics by the agencies of government). There are still many imperfections in our statistical system, although it compares most favorably with the data compiled abroad. We still lack adequate current figures on the operation of small business; our inventory statistics are inadequate;

[18] S. Res. 220, 72d Cong., 1st sess.

[19] *Twenty-Eighth Annual Report of the Secretary of Commerce* (Washington, D.C.: U.S. Government Printing Office, 1940), p. 29.

[20] The original study was issued as S. Doc. 124 (72d Cong., 2d sess.).

[21] The *Annual Report* of the Secretary of Commerce for 1935 actually states that "a new service was begun by the publication of a special article in each monthly issue beginning with September 1934" (p. 53).

our construction statistics are far from perfect; information on the service sector is woefully inadequate despite its growing importance. More facts are needed on the distribution and flow of income. Product detail, though much in demand at all levels of distribution, is frequently unavailable. Inconsistencies among many series still plague analysis (this criticism is not meant to refer to conceptual differences that are required to deal with different issues). We do not have adequate current regional information to supplement data portraying national developments, though it is increasingly in demand both for public and private policymaking. Improved and expanded surveys of business, government, and consumer anticipations and intentions are called for.

There is also room for the reexamination of the structure of the national accounts to take account of the changes in the institutional arrangements that have been occurring in the U.S. and to stop up some of the gaps caused at times by inadequate underlying statistical information. Such a review would consider the possibility of broadening the present coverage to take account of activities and services not currently taken into account in measuring the Nation's output. The current postulates regarding the distinction between consumption and investment could also be reexamined. There is also an increasing need to take into account, as part of our economic statistical system, negative products such as air and water pollution or other physical and social environmental deterioration. While some environmental problems are social in character, they have a decided economic impact and arouse a broad public concern which will continue to deepen. I hope that OBE and the *Survey* will rise to the occasion, meet the issues, and gradually generate meaningful environmental measures.

In the fifty years of its existence, the *Survey* has become an increasingly important instrument. It could quite properly be renamed *Survey of Current Economy*. The current interest in microdata and concomitant "publication" of the information on punchcards and computer tapes, a development to which OBE is already contributing, will not diminish the need for continued publication of economic statistics by the *Survey*. In fact, its usefulness is likely to increase as its scope broadens.

GEORGE JASZI

An Economic Accountant's Ledger

Review

Like anyone who wants to look intelligently into the future—be he a practitioner of leading indicators, a judgmentalist, an econometrician, or simply a human being —I must start with an assessment of the past.[1] The historical approach will have an incidental advantage. It will enable me to bring out two facts about the Office of Business Economics: much of our work has been done to meet the requirements of those dealing with major problems of the American economy; and we have, by and large, been alert and responsive in providing the tools of economic analysis and policy which were most urgently required.

OBE'S HISTORY

If we neglect changes in organizational titles that mask an underlying continuity of work programs—the measurement and analysis of the economy—OBE's contribution goes back half a century. The first period, which covers the twenties, constitutes, at least for me, pre-history.

The Twenties

In this period the measurement and analysis of the U.S. economy was done generally with such stone-age tools as time series on carloadings and pig iron production. But digging deeper, one uncovers an unexpectedly sophisticated tool: estimates of the U.S. balance of international payments. These estimates were based upon complex accounting relationships and statistical methodology and were incorporated into the system of national economic accounts that OBE later developed.

It is intriguing to speculate about the reasons for this far greater sophistication in

[1] Many of our contributors have done so: I draw special attention to TEPER's history of the *Survey*.

the measurement of our international than of our domestic business. Were the preferences of research workers a factor? Were the necessary data more readily available? Or was international information developed to an advanced level because it had been required to investigate problems that were the concern of economic policy? I am inclined toward the last of these hypotheses, but I leave its substantiation to an economist in search of a dissertation topic.

The Thirties

The thirties are a fairly homogenous period in the history of OBE. (I am using the name OBE for the sake of simplicity: we were christened with it only in the forties.) The myth of a self-regulating economy crashed in 1929 along with the stock market. Naturally, there was a great urge to explain and fight what became the Great Depression, and this required in-depth measurement of the processes and structure of the economy. In response, with the help of the National Bureau of Economic Research, we initiated regular series on national income and related magnitudes. These series represented the first major step in the development of OBE's national income and product (NIP) accounts.

A forward leap in the development of national income statistics at a time when the economy is under unusual strain is not unique to the U.S. of the thirties. The takeoff of NIP accounting in seventeenth-century England was closely linked to a fiscal emergency which led to the conversion of an essentially feudal system of taxation to one appropriate to a commercial economy. English national income statistics took another quantum jump in the wake of the Industrial Revolution, when another fiscal crisis was resolved by the introduction of the income tax. The association between the flowering of NIP accounting and profound changes in the structure of the economy attests to the pertinence of this branch of economic statistics.

Needless to say, great historical events do not explain fully the directions OBE's work took in the thirties, two aspects of which are particularly puzzling. First, OBE's work was confined to the income side of the accounts, and the product side—the side that some ten years later was to become the gross national product—was neglected. Calculation of a national product measure would have added greatly to the usefulness of the accounts for economic analysis and would have been feasible, given the state of the art. I am inclined to ascribe its omission to lack of statistical creativity, but this is only a hypothesis. The second puzzling fact is that OBE's series on incomes received in the various States was initiated in this period. It would be interesting to know whether this development was linked to the needs of economic analysis or policy or was less practically motivated.

World War II

World War II marks a distinct epoch in OBE's work. The war was responsible for the single most important development in its NIP accounts. When the task of mobilizing economic resources for the conduct of the war became paramount, it was clear that measures of income flows, such as wages and profits, were not sufficient. Measures of product flows—consumer purchases, investment, exports, and government purchases—whose sum is the GNP were also needed. Only with the aid of these GNP estimates was it possible to tackle the question of how much and what kind of output previously destined for civilian use could be diverted to the war effort. Further, in order to determine the fiscal and other policies that would be required to bring about this diversion, the income and product calculations had to be related to each other and had to be expanded

to take into account flows other than those measuring production. With the aid of such interrelated measures, it was possible to estimate, for instance, the volume and composition of the additional taxes needed to bring about given reductions in private spending.

These and similar calculations stimulated the beautiful notion of a complete set of accounts that would depict systematically the entire economic process in terms of the production, distribution, and use of the national output. While these accounts had their origin in the work OBE did during World War II, their design crystallized in the somewhat more leisurely period that followed the war.

The Late Forties and the Fifties

Although we were no longer confronted with the task of economic mobilization, it soon became clear that broad Government policies guiding the development of the economy had come to stay. Their implementation required further development of the NIP accounts. It became apparent at the same time that the information contained in these accounts was welcomed by business, other economic groups, and the public at large as a basis for intelligent decisionmaking. It was also needed for research directed toward understanding the functioning of the economy. In particular, it provided the factual basis for econometric modelbuilding, which began in this period.

Our work in the postwar years continued to be closely attuned to the requirements of realistic economic analysis and policy. Nailing down rough calculations we had made during the war, we split the GNP into real and price components in order to make it a usable tool for the study of economic growth and of inflation. Again building upon work started in the early forties, we prepared detailed, comprehensive, and timely quarterly estimates of the NIP accounts to fill the needs of increasingly active Government and business policymakers.

In this period we also developed and refined the Federal budget on NIP account, which has since become increasingly prominent in economic discussion. This construct infiltrated the Federal budget in the early fifties and, through recommendations of the President's Commission on Budget Concepts, which incorporated many of the features of OBE's Federal budget on NIP account, was a major influence in reshaping that document in 1969.

We also constructed estimates of the size distribution of income that were integrated statistically and definitionally with the aggregate income series. These were the first income distribution estimates that accounted for all incomes. Other information on the size distribution of income was, and remains, seriously deficient in this respect. Unfortunately, our estimates died of budgetary insufficiency in 1963. When resources permit, we shall reintroduce them in greatly improved form.

The reputation of OBE in the forties and fifties does not rest solely on the NIP accounts, however. We pioneered in the development of two other major measures of business activity: monthly retail sales and monthly sales, inventories, and orders of manufacturers, which have since been taken over by the Bureau of the Census.

We also made two major contributions to economic forecasting. We designed the Plant and Equipment Survey, which is probably the single most important forecasting tool of the survey type. It has been augmented over the years, and its current version, in which the basic information on investment plans is supplemented by information on starts of new projects and carryover and on the adequacy of industrial capacity, is much superior

to the original. Another major pioneering venture into the expectations field is our Survey of Manufacturers' Sales and Inventory Expectations.

The Sixties

We made major additions to OBE's work in the sixties. In spite of the underlying continuities, these additions set apart this period as another distinct chapter in our annals.

We explored in depth the industrial dimensions of the American economy by establishing the first measures of GNP originating in the various industries and initiating an input-output program. In the light of the experience of the Bureau of Labor Statistics with input-output work, we were somewhat apprehensive about the reception that our work would receive from business, but we were pleasantly surprised. We found that input-output had a large, receptive, and growing audience, particularly among business economists.

The second large-scale extension of our work was regional. In response to the escalating interest in regional economic problems, we supplemented the annual series on State income, which dates back to the thirties, by quarterly series. We also developed a set of annual income estimates by industrial origin and type of income, the building blocks of which are the standard metropolitan areas of the U.S. and the individual counties outside these areas. A wide variety of regional combinations of this information can be put together, depending on the data requirements for a particular analysis. We have used these estimates to make projections of regional economic growth in the U.S. Another element of our regional information system is an annual sample of Social Security-covered employment, which is useful in the analysis of the economic causes and consequences of migration. Much of our regional work is initiated in response to requests by users.

Great strides have been taken in our balance of payments program, which originated in the dim period of OBE's pre-history. We now have available quarterly data on the U.S. balance of payments in rich detail, supplemented by information on our international investment position, on plant and equipment expenditures abroad, and on the sources and uses of funds of the foreign affiliates of U.S. corporations. In cooperation with other Federal agencies, we make regular forecasts of the balance of payments.

We have begun to explore national wealth, a field in which, after a flurry of Government activity in the twenties, only private economists and statisticians have labored. To date, our contribution has been time series on the stocks of fixed business capital. We intend to supplement them with series on consumer durables, residences, business inventories, and Federal, State, and local capital assets. When they are ready, we shall have comprehensive and detailed annual information on tangible national wealth going back to 1929.

Another major line of work undertaken in the last few years is the development of econometric models of the U.S. In 1966 we were first to introduce short-term econometric models into the forecasting work of the Federal Government, and in 1969 the *Survey* published a longterm econometric model of the U.S. economy constructed by Lester C. Thurow of the Massachusetts Institute of Technology. We have maintained and developed both models.

The *Survey* is the medium through which most of our work is made known to the public. Through it we also discharge our function, which dates back to our beginnings, of

providing regular analyses of the business situation and of developments that significantly affect the functioning of the American economy. The *Survey* shows that we have made substantial progress in the performance of this function.

OBE is a small organization: its annual budget is about $6 million and its total staff about 300. But we have tried harder, and have achieved a great deal with these resources. There have, of course, been defects in our past performance, and much remains to be done, as is apparent from the contributions to this volume. The commentators do not confine themselves to birthday congratulations but, in response to my invitation, offer criticisms and recommendations for future work. I know, of course, that the tone of these contributions is generally more favorable to OBE than it would have been were it not for the festive nature of the occasion. But even though most contributors seem to be equipped with retractable claws and to have made generous use of that device, their criticisms, I am happy to observe, come through clearly.

GUIDE TO SUBSEQUENT DISCUSSION

The rest of my comments are concerned with the future. Before I present them, I want to characterize their nature and to provide an outline of the subsequent argument.

Cost-Benefit Analysis

It would have been possible to present these comments in the formal garb of cost-benefit analysis or its kissing cousin, PPBS (program, planning, and budgeting system). To do so, I would have had to start by offering a set of alternative major economic problems the Nation might face over the next fifty years and of alternative kinds of institutions and policies it might establish to deal with these problems. I would then have had to consider alternative tools of economic analysis that might be used to help formulate and execute these policies. Next, I would have had to lay out alternative ways of providing these tools, including alternative organizations and technologies for the Federal statistical and economic information system. This is only a crude and simplified outline of a procedure from which I refrain in these pages.

I have assumed here, instead, that the economic goals and problems of the Nation—growth, stability, and a just distribution of income—will not change radically, and that we shall approach them with the aid of the same kinds of economic policies we use now. I have also ruled out the possibility of a drastic change in the tools of economic analysis and even in the nature of the Federal statistical and economic information system.

Next, I decided that I cannot set priorities for the major programs of OBE. They seem to be about equally important. First, they serve different needs that I see no way of ranking. I find it impossible, for instance, to give priority to economic intelligence needed to deal with balance of payments problems over economic intelligence needed to foster local area development. Equally important—and somewhat paradoxical—is the fact that all elements of OBE's program contribute to the same goal: an integrated system of economic intelligence. Many of the major economic problems that confront the Nation require the application of the entire system because economic problems are pervasive. It is necessary to consider industry, regional, and international dimensions of most economic problems as well as of alternative solutions proposed for them. To keep all these dimensions in mind, it is necessary to have the unified framework of analysis that is provided by the national accounts. Finally, the major gaps in facts and analyses are of about equal magnitude in each of OBE's major programs.

Taken together, these considerations indicate strongly that the proper future direction of OBE is one of balanced expansion of

our work in the major branches of the national accounts (income and product and wealth, balance of payments, input-output, and subnational), in analysis, and in data collection.

I have come to these unexciting conclusions not only because I think that they are reasonable, but also because I wish to steer clear of two other options. Had I opened my mind too wide, I would still be wandering in a maze of alternatives. The other option would have been to take on the role of a science fiction writer, but my leanings are not in that direction. I cannot write a story about what the ghost of OBE would do after a centralized data collection apparatus, exclusively oriented to the generation of an overall socioeconomic accounting system, had been established in a centralized economy in which decisions are formulated and executed in a secret computer center. I can only suppose that OBE's ghost would haunt such a world, and I would encourage it to do so, but my imagination takes me no further.

Nature of Comments

Having struck the note of balanced program emphasis, I hasten to add that what follows is not a balanced survey of all the programs of OBE, though most of them will receive some attention. I do not know enough to prepare such a paper. Differences in the degrees of emphasis applied below to various topics are also the result of my attempt to discuss whenever possible the specific recommendations of individual contributors. These recommendations are summarized in a series of synoptic tables that accompany the discussion. As these tables show, some aspects of our work received much more attention than others.

Not every recommendation could be summarized satisfactorily in the tables. I encountered particular obstacles in connection with calls for the measurement of welfare. It was difficult to decide what, specifically, some of these recommendations recommended. For example, it was not always clear whether we were asked to banish GNP from the realm, or to work towards a peaceable kingdom in which the lion lies down with the lamb. I hope that my tables have not done too much violence to the intentions of the contributors.

My comments are an exercise in review and assessment, a mixture of reflections on the future of OBE's work and on the future of the kind of work OBE does (which is not quite the same thing), along with some additional notes on OBE's past. Throughout, I have had a secondary purpose in mind as well: that of giving our public somewhat more insight into the workings of OBE than it may heretofore have had. This is, therefore, one non-salesman's footnote to HOLTON's amusing reflections on "selling" OBE.

The sample from which I invited contributions was small. However, I tried to make it representative of the users of OBE's intelligence, with the one exception that economists now employed in the Executive Branch of the Federal Government were excluded. The two dozen or so invitees who did not contribute make the sample vulnerable to response bias, although no particular bias is suggested by an analysis of the complete list. Contributors were not admonished to weigh all aspects of OBE's work on an objective scale and to present a set of recommendations based on a careful ordering of priorities. Rather, they were encouraged to comment on whatever aspect of OBE's work happened to be closest to their hearts. Finally, the nature of the exercise was conducive to recommendations for work OBE should undertake; it was stacked heavily against the registration of *don'ts*. In view of this, the *don'ts* that were registered

should perhaps be given extra weights. (I am thinking particularly of OKUN's contribution.) But it is even safer to refrain altogether from quantitative comparisons of the number of entries which favor particular projects.

Scheduling needs made it impossible to give the authors an opportunity to reply in this volume to my comments on their contributions. It would not be fair to reserve the last word for myself; accordingly, I extend a bona fide invitation to them to respond in a future regular issue of the *Survey*.

Sequence of Argument

The core of OBE's work is the construction of the national accounts from raw data, supplied largely by other agencies. This construction job requires both concepts and estimating methods of considerable complexity. In addition, OBE engages in some data collection of its own and in the analysis of the economy. It uses in this analysis the data it gathers, the estimates it prepares, and all other pertinent information—such as information on the labor force, employment, and unemployment—that is collected and processed outside OBE.

It is convenient to take up analysis first, data collection next, and to conclude with the national accounts. But, as will be obvious, some liberties have been taken with this sequence.

I shall first address myself to sundry recommendations that did not fit this scheme. An examination of the role of analysis in OBE's work follows. The discussion of data collection is limited to OBE's domestic surveys; foreign surveys are dealt with later in connection with our balance of payments work. The section on the national accounts is preceded by another on subjects that arise mainly because they involve methodology (statistical data sources and estimating methods). Reflections on the overall design of national economic accounts are followed by some suggestions for a more pragmatic approach to the work of the national economic accountant, entitled "Alterations and Minor Additions." Four major OBE programs—size distribution of income, subnational work, input-output, and balance of payments—are taken up next. Then attention is turned to two basic breakdowns of output, consumption and investment. Problems relating to investment are taken up first, under the heading "Saving, Investment, and Balance Sheets." "Consumption" is mainly concerned with problems of imputation, the measurement of income and product in kind. "Environment" treats problems currently receiving much attention which, in the context of national output measurement, can be regarded as an extension of the more conventional imputation problem. Under "End of Output Measurement" the possibilities and difficulties of introducing further changes in the definition and measurement of output are outlined. This plan of discussion is summarized below.

Sundry Recommendations
Analysis
Domestic Surveys
Methodological Issues
Design of National Accounts
Alterations and Minor Additions
Four Major OBE Programs
Saving, Investment, and Balance Sheets
Consumption
Environment
End of Output Measurement

SUNDRY RECOMMENDATIONS

These recommendations fall into two groups, of which one is concerned mainly with organization and the other with work programs.

Organizational Matters

Few of our contributors deal with organizational problems. PARADISO recommends that OBE take over all work relating to the

measurement of production. The division of labor in the measurement of production and productivity among the Bureau of Labor Statistics, the Federal Reserve Board, and OBE is complex. The FRB is in charge of the index of industrial production, which often gives signals that are somewhat different from those given by the corresponding component of GNP. The division of labor between OBE and BLS is in productivity measurement and can be explained succinctly as a Siamese twin arrangement in which OBE is the numerator and BLS the denominator. These kinds of arrangements are obviously subject to periodic strain, but on the whole they have worked satisfactorily because staff relations have generally been good both at top and at working levels. Some of the complex methodological problems that have arisen are mentioned below. I doubt that centralization of work alone would do much to resolve them.

Other areas in which there are close interagency connections are the flow of funds work of the FRB, mentioned later in the section "Saving, Investment, and Balance Sheets," and, to a much smaller extent, the price work of BLS. With respect to the bulk of that work we are simply users of primary statistical source data, no different from the position which we occupy in relation to the other data-collecting agencies on which we rely.

Other organizational recommendations are made by R. J. GORDON, including a brief comment calling for the establishment of a Central Statistical Board and of a research section within OBE. These recommendations would have deserved more detailed discussion on his part.

Both R. J. GORDON and HOADLEY, in very different ways, urge us to improve our outside contacts.

Work Programs

PARADISO recommends that we resume our work on the business population, a program we discontinued because it was marginal to our main activities and because to perform it competently would require vastly larger resources than are at our disposal. TEPER calls for more information on small business, another area in which resources greatly in excess of those available to us are necessary, mainly for data collection. The reader is also referred to KLEIN's proposal for a data bank.

DENISON's and JORGENSON's call for estimates of total factor inputs is in a different class. These are close to the heart of our work, they involve estimation rather than data collection, and the resources required to conduct the program are moderate. Denison's discussion of some basic issues of productivity analysis in the *Survey* [2] has done much to resolve the conceptual problems which stood in the way of valid empirical work in this field. It is to be hoped that the reply by Jorgenson-Griliches which is in preparation will have a further effect of the same kind. In my opinion, the issues that are in greatest need of further clarification relate to the recommendations JORGENSON makes for work on rates of return.

[2] "Some Major Issues in Productivity Analysis: An Examination of Estimates by Jorgenson and Griliches," *Survey of Current Business*, pt. 2, May 1969, pp. 1–64.

Analysis

More analysis	R. A. Gordon, Hoadley
Balance of payments	Salant
Better articles in *Survey*	Salant
Determinants of exports	Salant
Full employment goods and services balance	Salant
Input-output	R. A. Gordon, Klein, Mennis
Subnational	Poole
Role of consumer	Paradiso
Income elasticity of consumption	Paradiso
Role and determinants of investment	R. A. Gordon, Paradiso
Personal saving	O'Leary
Corporate profits	O'Leary
Expectations	O'Leary
Integration of NIP accounts and economic indicators	Eckstein
Potential output	Knowles
Use of financial variables in forecasting	Knowles
Reviews of outside research	R. A. Gordon
OBE econometric models	Klein
Integration of models and input-output	Klein
Reports on functioning of models	R. A. Gordon, Grove, Parker and May
Discussion of segments of models	Paradiso
Publication of forecasts of OBE models	Lewis, Mennis, Parker and May, Paradiso (No)
More outlook material in *Survey*	Greenwald, Hoadley

It is interesting that so few of our contributors deal with the interpretation of final output as the sum of costs and profits, and with the related issue of factor cost versus market price valuation. (Most of the discussion which is extensive is in terms of the product flow side of the production account, and this is dealt with at length, beginning with the section "Saving, Investment, and Balance Sheets.") I should have welcomed a discussion of the factor cost valuation, which in recent years has received increasing prominence because of its relevance to the study of economic growth, and also of more detailed problems under the same heading, such as the distinction between direct taxes and indirect business taxes, and the partitioning of mixed incomes (entrepreneurial and perhaps rental incomes) into labor and "property" components.[3]

ANALYSIS

As can be seen from the table, we are called upon to engage in more analysis on many fronts. I am entirely sympathetic to such a call, although I shall want to make sure that our limited forces are not scattered. The progress we have made in recent years in realistic, policy-oriented analysis is proof of our bona fide commitment.

Function of Analysis at OBE

The cross-fertilization between analysis and estimation has raised the quality of our

[3] I have discussed the factor cost concept in "The Conceptual Basis of the Accounts," in *A Critique of the United States Income and Product Accounts*, ed. Joseph A. Pechman, Studies in Income and Wealth 22 (Princeton, N.J.: Princeton University Press, 1958), pp. 15–145.

contribution to both endeavors. For instance, our econometric models benefit from the fact that they are fed a data diet which is prepared by extraordinarily competent cooks with an unrivaled amount of loving care. Analogously, the structure of our national accounts is highly functional because analytical work has helped us to develop a user-oriented attitude and saved us from the detachment from the world of economic problemsolving suffered by many less fortunately placed producers of statistics. More subjectively, analytical work has enriched our statistical lives. This is not really surprising because realistic economic analysis is the fulfilling purpose of producing economic statistics.

Policy Analysis and Advice

From time to time it has been feared that participation in policy-oriented analysis involves great risk for OBE because it is likely to cast doubt on our objectivity. I am not alarmed. We have a reasonably clear principle to guide us: we are eager and willing to try to diagnose actual or emerging economic problems and to test the effects of alternative therapies. But this is where we stop. We do not recommend the therapy to be adopted. This choice we leave to the policymakers.

If this principle is subjected to more searching examination, it is not as clear-cut as it seems at first sight.[4] Also, like all general principles, it needs to be interpreted when applied to specific cases. But pragmatically it has served us well and has been institutionalized at Commerce in the division of labor between OBE and the Office of Assistant Secretary for Economic Affairs.

Content of Analysis

The core of OBE's work is the construction of the national accounts. So much interesting analytical work related to the accounts remains to be done, and our resources for doing it are so limited, that it would serve no useful purpose to formulate a program of economic analysis with a structure of its own. We can choose from the ample display of recommendations in the table above or add to it, especially as circumstances change. "To our customers according to their needs, from us according to our abilities," to misquote a famous maxim, will be a sufficient guide. This has been our guide all along, and I cannot discern a grander design for the future.

I shall, however, add two remarks about the nature of analysis as I see it. First, by "analysis" I mean primarily analysis directed at a better understanding of the economy—of the forces that determine the production, distribution, and use of output. There is another type of analysis, valued and encouraged at OBE, but it does not have the same invigorating properties that I have claimed for analysis. It is more aptly called methodological research, focusing as it does on the techniques of constructing estimates. An investigation of whether one estimating technique will yield more reliable values for subnational input-output coefficients than another exemplifies the latter type of analysis.

Second, I favor simple recipes. To my mind, research oriented toward the understanding of the economy consists of the attempt to discover clear and stable patterns among economic flows or stocks. As often as not these patterns can be discovered by creative table reading as easily as—or more easily than—by resorting to the pyrotechniques of advanced quantitative research. An example is an article by Edward F. Denison on the distribution of income, which was published almost twenty years ago in the *Survey*.[5] To the best of my knowledge, this

[4] See Gunnar Myrdal, *Objectivity in Social Research* (New York: Pantheon, 1969).

[5] "Distribution of National Income," *Survey of Current Business*, June 1952, pp. 16–23.

was the best study of the distribution of income by income shares at the time of publication, and I am not aware that it has since been superseded. Yet it was based on simple techniques: the decomposition of income by legal form of organization, an approach that uncovered strong regularities that had been masked by excessive aggregation.

Publication of Econometric Forecasts

I am particularly interested in the penultimate recommendation listed in the table, to the effect that we publish our econometric forecasts. Those voting "aye" are LEWIS, MENNIS, and PARKER AND MAY, and I suspect they would have the support also of GREENWALD and HOADLEY, although I cannot vouch for them. PARADISO is the one voting "nay." I am afraid the "nay" has it, although the publication of our forecasts is a development devoutly to be prayed for.

The present situation is unsatisfactory. By and large, the Council of Economic Advisers is the arbiter of what quantitative Federal Government forecasts can be published, and when. Not only is the public barred from information (and misinformation) which it would like to have, but equally or perhaps more important, the present embargo does not work. There exists a bootlegging operation in Federal forecasts, whose effects are discriminatory and unfair. I am not naive enough to think that there is an easy solution to this problem. In fact, I have in the past called the unfettered publication of Federal forecasts the closest simulation of atomic proliferation that is within the capabilities of the comparatively innocuous breed of economists and statisticians. Nevertheless, I believe that we should make a determined effort to improve upon the present state of affairs. I am afraid, however, that the solution lies in raising standards of fairness and intelligence to levels that, I must regretfully admit, seem quite utopian in the year 1971. I look forward to the day when a treaty for the peaceful uses of Government econometric forecasts is ratified.

DOMESTIC SURVEYS

As noted earlier, OBE is not mainly a data-collecting agency. Only about 15 percent of its total budget is devoted to this purpose. A large part of the data collection program is in connection with balance of payments work, and it will be referred to in that connection. Here OBE's domestic surveys of actual and planned investment—the Plant and Equipment Survey and the Survey of Manufacturers' Sales and Inventory Expectations—will be discussed.

Role of Surveys in OBE's Work

OBE feels the need to do some survey work. Ongoing survey work permits us to conduct at short notice and with great dis-

Domestic Surveys

Plant and Equipment Survey	
Greater industry detail	Greenspan, Greenwald
Separation of plant from equipment	Greenspan, Greenwald, Grove
Separation of autos	Greenspan
Expansion vs. replacement investment	Gainsbrugh, R. A. Gordon
Measurement of capacity and its utilization	Gainsbrugh
Subnational detail	Greenwald
More special analytical surveys	R. A. Gordon, Paradiso
More frequent studies of differences between plans and realizations	R. A. Gordon, Paradiso
Manufacturers' Sales and Inventory Expectations Survey	
Expansion of work	Greenwald
Evaluation of performance	Grove
More expectations surveys	Teper
Construction activity	Lebergott
Military expenditures	Lebergott

patch investigations that are of topical interest. The survey of the impact of the 1966 credit crunch on plant and equipment and inventory investment is an example.[6] These surveys also permit OBE to pursue its interest in the determinants of business investment behavior and to make innovative contributions to this kind of survey work. Conduct of these surveys also gives OBE easy access to the data it needs to analyze, and maintains and develops its skills in the interpretation of survey results. In theory it would be possible to draw up organizational schemes providing for retention of most of these advantages if surveys were conducted by other agencies for OBE; in practice, I doubt that they could be retained.

Specific Recommendations

I have no specific comments on the recommendations of our contributors as summarized in the table. I agree with most of them; several of them are being implemented—for instance, the separation of plant from equipment investment. It is regrettable, however, that we are not making adequate progress toward putting on a more solid foundation the allocation of automobiles between consumption and investment, a requirement to which GREENSPAN and PARADISO point. I should even like to move in directions (such as expansion vs. replacement investment and the measurement of capacity and its utilization) where the conceptual nets for catching the empirical butterflies are exceedingly flimsy. I am also greatly interested in the suggestion of LEBERGOTT and TEPER that the scope of the expectations surveys be expanded. I would have put a survey of State and local government expenditure plans first on the list, but this is a matter of detail.

METHODOLOGICAL ISSUES

Although I want to uphold and strengthen OBE's analytical arm, I see clearly that the main focus of our work should be the care of the U.S. national accounts. Our fundamental responsibility to the public is to maintain the quantity, quality, and timeliness of these estimates. In the table below the recommendations of our contributors which relate to this responsibility are assembled.

Primary Data

The first set of recommendations in the table deals with the need for primary data. As mentioned earlier, OBE is not mainly a collector of primary data.

Primary Data and Their Processing

Most of these data are obtained from other organizations, largely but not entirely public, which collect them not for the purpose of facilitating the construction of the national accounts but as part of general-purpose statistical programs (Census Bureau) or as by-products of the administration of other programs, such as the State unemployment insurance programs (Office of Manpower Management and Data Systems), the Federal tax program (Internal Revenue Service) and the formulation and execution of the Federal budget (Office of Management and Budget and Treasury), to mention only the most important sources. I might observe here that the U.S. is more richly endowed with primary data than any other country in the world.

[6] Jean Crockett, Irwin Friend, and Henry Shavell, "The Impact of Monetary Stringency on Business Investment," *Survey of Current Business*, August 1967, pp. 10–26.

Methodological Issues

Better source data	Lebergott
Personal consumption of services	Grove
Construction	Teper
Inventories	Teper
Estimating techniques	
More mechanization	Eckstein
Monthly GNP	R. A. Gordon, Greenwald, Grove (No), Mennis, Paradiso, Salant (No)
Series not adjusted for seasonal variation	Grove
Methodology of seasonal adjustment	Grove
Better measures of real volume and prices	
Deflator for fixed business investment	Grove
Price and quantity data for foreign trade	Eldridge, Klein
Production and productivity in services and/or trade	Burns, Lewis, Teper
Specification pricing of labor services purchased by government	Denison
Coordination of Plant and Equipment Survey and GNP revisions	Grove
Guides to methodology	
Reconciliations	Burns, Klein
Price indices and GNP deflators	Parker and May
Consumer price index and deflator for personal consumption	R. J. Gordon
Retail sales and personal consumption, goods	Paradiso
FRB consumer goods output and personal consumption, goods	Paradiso
Plant and Equipment Survey and fixed business investment	Paradiso
FRB manufacturing index and manufacturing GNP	Parker and May
Personal saving estimates	Klein, Paradiso, Parker and May
IRS corporate balance sheet and capital stock	Greenspan
Methodologies	Parker and May
NIP accounts	Ando, Denison, Eckstein, Grove
Input-output	Carter and Leontief
Measures of relative error in estimates	Klein
Comments in *Survey* on primary data problems	Grove
Balance of payments basebooks, better updating	Greenspan
NIP basebooks, better updating	Paradiso
Easier access to unpublished information on balance of payments	Greenspan, Salant
Survey of Current Business	
Clearer references in "S" pages to *Business Statistics* supplement	Mennis
Better location of "S" pages	Paradiso
Improved charts	Greenwald, Paradiso
Analytical ratios and rates of change	Paradiso
Reorganization of "S" pages	Paradiso
Machine-readable *Business Statistics* supplement and *Survey* data	Grove, Klein
Data on foreign economic performance	Klein
Subnational data in "S" pages	Klein, Teper
Methodologies for series prepared by other agencies	Klein

Through the use of estimating techniques that are quite complex, even though they do not in general require advanced statistical techniques, these raw data are converted by OBE into the estimates of the national accounts. In this capacity, OBE can be compared to a manufacturer who processes raw materials into highly intricate types of equipment, using ingenious industrial technology. Alternatively, OBE can be viewed as assembling a jigsaw puzzle which depicts the national economy. Some raw materials may be deficient and there may be failures in

technology; some pieces of the puzzle may be missing or may not quite fit. And sometimes the puzzle may be too hard for the player. But, by and large, we manufacture the best mouse trap and assemble the finest picture of the economy.

Furthermore, we can put together estimates that are usually a little better than their component parts. We can do this because we are protected by the guardian angel of statisticians—Offsetting Error—and also because the discipline of the accounting approach allows us to use circumstantial evidence to ferret out and eliminate inconsistencies [7] and to fill gaps by residual.[8]

But we should not rely excessively on guardian angels and economic accountants' secret weapons, and we should like to add a loud "aye" to the recommendations of our contributors. We should also like to say that while their list contains important items, it is not representative of the statistical gaps that need to be filled. Only recently we sent our own shopping list, covering about fifty pages, to the President's Commission on Federal Statistics.

Standards of Statistical Accuracy

While I am strongly in favor of the improvement of source data, I do want to draw attention to what LEBERGOTT calls an "almost neurotic concern with second differences" in the estimates. This concern is most prevalent among those who use GNP as an economic barometer rather than as a tableau of the economic process. Such persons are deeply disturbed if, say, a routine revision of GNP, amounting perhaps to no more than $1 billion, shifts a cyclical turning point from one quarter to another. Ensuring against this kind of error in a trillion-dollar economy by improving the basic source data would be not only prohibitively expensive but would also be downright impossible unless all productive resources of the Nation were transferred to the compilation of GNP. Even so, we might be foiled: one single computer who was participating in this national effort might, without malice aforethought, undo it as with professional pride he tackled the routine of updating seasonal factors.[9]

To forestall extravagant and self-defeating developments of this type, we need to couple our campaign for data improvement with an educational campaign in the proper use of GNP. Gross national product should not be interpreted primarily as an economic barometer but rather as the center of a tableau that depicts the functioning of the economy. In this tableau, the magnitudes are presented within the framework of a disciplined accounting system in which the various economic flows are shown in relation to each other. The structure and classification of the system has been designed to provide a realistic description of the important features of the economy and hence tends to meet the requirement of practical economic analysis and of policy formulation and execution. No rival framework for the study of the economic mechanism exists.

[7] " 'There is no single fact to justify a conviction,' said Mr. Cock; whereon the Solicitor General replied that he did not rely upon any single fact, but upon a chain of facts, which taken all together left no possible means of escape" (*The Times* [London], November 16, 1894, quoted by Samuel Butler in his *The Authoress of the Odyssey;* Butler notes that "the prisoner was convicted").

[8] The major example of residual estimating was the calculation, in the early period of our operation, of both personal consumption and personal saving without a single data source. We knew income, depreciation, and indirect business taxes accruing from production. Hence we knew total GNP. We knew investment, domestic and foreign, and government purchases. Hence we could obtain personal consumption as a residual. But income (personal disposable, which we also knew) less consumption gave us personal saving. I am nostalgic for those good bold days.

[9] In the following passages I draw on my paper, "The Quarterly National Income and Product Accounts of the United States, 1942–1962," in *Studies in Short-Term National Accounts and Long-Term Economic Growth,* ed. Simon Goldberg and Phyllis Deane, Income and Wealth, ser. 11 (London: Bowes and Bowes, 1965), pp. 100–187.

The entries in this system, even though they lack precision, are usually solid enough to give a correct indication of the direction in which aggregate economic activity is moving and of whether the change is large or small. Of equal importance, they show the major factors that are responsible for the change, and their relative importance. They provide the basis for an order-of-magnitude analysis of economic events.[10]

With this kind of interpretation of the NIP accounts in mind, users of GNP will be less likely to view a $1 billion change as evidence of an upturn or a downturn in GNP and will see it more accurately as an indication that GNP has not changed. Instead of reacting to the discovery that a butter knife is too blunt for shaving by trying to hone it to a razor edge, they may relax and use it to butter their bread.

There is another consideration that should enter into our attitude toward data gaps. The margin of error to which the GNP accounts are subject is not the only limitation in their application. The shoe pinches on other feet as well. There are weaknesses in economic theory and in the statistical techniques of uncovering economic relationships. No degree of accuracy in the GNP estimates will save us from the perils of multicollinearity. Nor would a perfect GNP dispel the clouds that blur our vision of exogenous factors. A concern for statistical accuracy motivated by the notion that statistical accuracy will lead to perfection in economic analysis is unwarranted and potentially dangerous.

Estimating Methods

The second group of entries in the table contains recommendations that pertain to our processing of the raw data. Needless to say, neither our contributors nor I can give a full-dress review of OBE's estimating techniques. This would be not only an endless affair; it would also be endlessly boring. But I feel moved to comment on some of these recommendations and to add a few of my own.

Mechanization of Estimating Techniques

ECKSTEIN "would argue for a generally more mechanistic approach to the production of the national income accounts." "Peter Jones and I," he goes on, "have recently developed a very simple econometric model which crudely simulates the procedures by which the OBE converts the basic monthly data into the quarterly preliminary GNP estimates. This experience persuades us that the basic results can be obtained without relying on large amounts of human judgment. There may even be a case for substantially computerizing the construction of the national income account estimates, subject, of course, to the careful annual revision."

I want to note first that ECKSTEIN's contribution is dated February 8, 1971, and that he did not have an opportunity to revise it in the light of the first quarter 1971 GNP results. But the matter deserves more serious comment than an in-joke.

By way of background, we have done considerable experimentation with the computerization of the NIP accounts. Initially,

[10] This characterization is subject to qualifications. Diagnosing the policy mistakes that were made at the beginning of the Vietnam War, Arthur M. Okun says: "Our intelligence system for tracking current movements did not perform well. This was the only period in my experience during which the preliminary estimates of economic activity qualitatively misrepresented the true situation. As of November 1965, official estimates of GNP showed a rise of $36 billion and a real growth of 5½ percent for the first three quarters of the year—essentially a continuation of the brisk growth of 1964. The estimates today for the same time period show a gain of $46 billion and an enormous 8 percent rate of real growth" (*The Political Economy of Prosperity* [Washington, D.C.: The Brookings Institution, 1970], p. 68). Okun does not mention the fact that almost one-half of the error had been corrected in time for incorporation in the 1966 Report of the Council of Economic Advisers.

we had in mind a grand cradle-to-grave design in which the computer would be fed the raw data inputs and would lay the NIP-accounts egg without the chicken once having touched the ground of human judgment. Experimentation with this approach yielded results as mixed as this metaphor. It is our tentative conclusion that A-to-Z computerization is not warranted because the estimating process is not sufficiently large-scale and repetitive. However, we have benefited greatly from the computerization of those steps of the estimating process which do fit these criteria.

A major factor that militates against complete computerization is our firm conviction that it is an essential part of OBE's function to produce estimates which make sense and which are not marred unduly by major inconsistencies and discrepancies, such as would arise if we confined ourselves to a purely mechanical processing of imperfect raw data. The first paragraph of the following quotation, which is taken from the 1954 National Income supplement, expresses this view of our function, to which I continue to subscribe fully:

> The statistical discrepancy measures the net residual of error which remains after the best possible estimates of the various components of the income and product flow have been made. If initial estimates of the components lead to a sizable statistical discrepancy or to erratic movements in it, they are reexamined and an effort is made to trace the source of the discrepancy and to eliminate it as far as possible. This reexamination of the initial estimates consists mainly of a critical comparison of the methodology of the component estimates for error and inconsistency. This is an essential step of the estimating procedure which cannot be taken by the individual estimators responsible for the preparation of the component series, but must be reserved until initial estimates of all the components have been prepared. While significant improvements can sometimes be made in this manner, a residual discrepancy will remain.[11]
>
> The suggestion has been made that this residual discrepancy should be eliminated, either by the exercise of further judgmental decisions of the type used in reducing it from its initial size, or by the application of more formal mathematical procedures that tend in the direction of greater objectivity. Superficially, complete elimination of the statistical discrepancy would be desirable, from the standpoint of convenience to the users of the data. Basically, however, it would be harmful. A statistical discrepancy of substantial size or irregular movement reflects troublesome errors in the estimates. If this is the situation, the users of the data should be aware of it so that they can exercise due caution in the application of the estimates in economic analysis.[12]

We are having some second thoughts concerning the second paragraph, although we have not abandoned the view that it expresses, and we may not do so. While we

[11] For a specific application of this approach, see Office of Business Economics, *U.S. Income and Output*, Supplement to the *Survey of Current Business* (Washington, D.C.: U.S. Government Printing Office, 1958), pp. 74–75.

[12] Office of Business Economics, *National Income*, Supplement to the *Survey of Current Business* (Washington, D.C.: U.S. Government Printing Office, 1954), p. 65.

firmly believe that the application of experienced judgment generally improves the statistical results, the exercise of such judgment may arouse suspicion in many users of the estimates, and operating under such a cloud is an occupational hazard which the estimator would be happy to avoid. Accordingly, we have begun reinvestigating a method, proposed by Stone,[13] the essence of which is the computation of adjustment factors based on a mathematical assessment of the relative reliability of the component estimates. The method was developed under simplified assumptions and has not been worked out and tested in the light of all the problems that are likely to arise when an attempt is made to apply it to the complexities of the real world. But if attempts to bring it down to earth are successful, it might combine the advantages of the present method with the advantages of being reproducible by others.

Preliminary Estimates

Timeliness versus accuracy is an important dilemma which confronts producers and users of economic intelligence. Some of the users of our data have suggested that a partial solution of the dilemma might be found in publishing the preliminary GNP estimates, which are based on partial source data, only for quarters that are easy to estimate, and to postpone publication of the estimates for difficult quarters until the full array of quarterly source data is in. This suggestion is treacherous enough to require discussion.

For many years OBE prepared the preliminary GNP estimates but gave de jure responsibility and publication rights for them to the Council of Economic Advisers. In 1964 we took over the publication of the estimates and assumed full responsibility for them. Over these years it has become apparent that the preliminary estimates are preponderantly good approximations of the estimates that are published one month later, on the basis of three months' data for inventories and foreign trade. There is general agreement that the preliminary estimates are useful to the public, and there has been no suggestion that they be discontinued. This situation having been established, we must produce these estimates on schedule whether the economic situation is transparent or confused. The making of exceptions would take us far out on a limb. For example, it is very difficult to make estimates of GNP at cyclical turning points. Imagine the pressures, interpretations, and misinterpretations to which we might be subject at cyclical downturns if we could choose whether or not to publish preliminary GNP estimates.

The proper tradeoff between timeliness and accuracy is not easy to determine. We cannot wait until the last datum has been heard from, even though data sources that become available with lags of five years and longer may substantially change our estimates. (An example of this is the benchmark revisions of 1965.) On the other hand, our thirst for timely information should not transform us into a pack of ambulance chasers, ruled exclusively by the First Law of Economic Dynamics.[14] We must avoid the extremes.

Monthly GNP

It will be useful to discuss in this connection a new project we have started, the estimation of monthly GNP. The project is favored by R. A. GORDON, MENNIS, and PARADISO, while GROVE and SALANT express doubts. They may suspect us of the ambulance chasing I have just decried. I should like to state the statistical case for monthly GNP in the following way. For the most part, the source data available for this project are

[13] Richard Stone, D. G. Champernowne, and J. E. Meade, "The Precision of National Income Estimates," *Review of Economic Studies* 9 (1942): 111–25.

[14] The First Law of Economic Dynamics has never been codified, to the best of my knowledge. This is surprising in view of the fact that it plays such a dominant role in the practice of our profession. I venture the following formulation: "If things turn up [down], they will continue up [down] unless they turn down [up]."

of a quality comparable to that of the data underlying the quarterly GNP estimates. Admittedly, problems of seasonal adjustment and of synchronization, which are discussed below in another context, will loom much larger in the preparation of the monthly estimates. However, it seems to me that we should be able to overcome these difficulties inasmuch as they have been overcome in the calculation of the FRB index of manufacturing production, even though manufacturing is by far the most volatile component of total output. If, despite these efforts, the monthly estimates prove too erratic for economic interpretation, it will always be possible to combine them into overlapping quarterly totals or to remove excessive noise by other techniques. In one way or another, estimates containing information relating to production that has occurred in recent months will be available substantially earlier than at present. Last but not least, the additional resources invested in the estimation of GNP will help to improve the methodology for estimating the full set of quarterly NIP accounts.

Unadjusted Estimates

Unadjusted income series, other than corporate profits, were discontinued in 1958, essentially because the data sources were not sufficient for the preparation of genuinely unadjusted series.[15] For instance, the source data for the quarterly wage and salary estimates do not include yearend bonuses. These are covered in the annual data and are spread among the quarters in the course of interpolating and extrapolating the annual estimates. Again, information on profit margins is not available for the estimation of quarterly nonfarm entrepreneurial income; in many lines of business, such as construction and trade, in which the noncorporate form of organization is prevalent, these margins are probably subject to substantial seasonal variation. Here, too, genuinely unadjusted estimates cannot be prepared. To cite one more example, in the estimation of farm income the problem of seasonally adjusted versus unadjusted series is particularly acute because the whole notion of farm production on a less than annual basis is probably tenuous, even conceptually, and is certainly difficult to implement statistically.

Needless to say, when unadjusted series cannot be prepared, it is not possible, strictly speaking, to produce seasonally adjusted series either. In these circumstances, the latter will necessarily involve the smoothing of erratic elements. However, the series we call "seasonally adjusted" are certainly much closer approximations to what would be genuine seasonally adjusted series than our so-called unadjusted series were to genuine series not adjusted for seasonal variation. These considerations were reinforced by the observation that user interest in the unadjusted series was small.

Abandonment of the seasonally unadjusted income series in 1958 was accompanied by a change in the procedure for publishing the unadjusted GNP. This series was also tainted by the data difficulties to which the income series was subject, but to a smaller extent. It was decided to continue preparation of the unadjusted quarterly GNP series, but only once a year. Unfortunately, this decision led to a less careful nursing of the unadjusted GNP series than that which the adjusted quarterly series receive.

Matching sets of seasonally adjusted and unadjusted series should be available as a matter of clean statistical practice, and we shall do what we can to correct our shortcomings. However, as I have noted, we shall be severely handicapped by the widespread absence of genuinely unadjusted raw data.

While dissatisfaction with our performance in this area is justified, I cannot accept

[15] In this and the next section I use, with a few changes, the formulations used in "The Quarterly National Income and Product Accounts of the United States, 1942–1962."

two particular forms in which the criticism comes. First, it is observed that the implicit seasonal factors (the ratios of the seasonally adjusted and unadjusted quarterly GNP series) vary for identical quarters from year to year, and it is concluded that this points to a flaw in the estimates. This is not necessarily so. If seasonal adjustments are applied to detailed components, as is done at OBE, the implicit seasonals for combinations of components and for totals may vary if the relative importance of the components changes. Substantial variations in implicit seasonals can also be observed in a number of series other than GNP that are based on similar seasonal adjustment techniques.

Accordingly, variations in implicit seasonals that stem from a seasonal adjustment technique which is applied separately to components can be regarded as a flaw in the seasonal adjustment procedure only if it is believed that seasonal adjustments should be applied to totals rather than to components. Even though I can see a justification for the latter approach in certain cases (e.g., disposable personal income, taxes, and saving; corporate profits, taxes, and retained earnings; production, sales, and inventory change, in some instances), I believe that the detailed component-by-component method is theoretically superior in most cases and is pragmatically so in almost every case.

The second line of reasoning that I cannot accept is that seasonally unadjusted estimates are urgently required in many kinds of analysis. I can think of some cases in which such estimates are required, for instance, in the analysis of financial flows or of the construction industry, where seasonal variations in employment are a matter of economic concern. But a broader claim for the importance of unadjusted data I find difficult to sustain.

In particular, I am not convinced by the claim that the use of unadjusted estimates is preferable in the construction of econometric models. I cannot see what an econometrician would gain from having farm data that would show him time series e, 0, e, 0, . . . for expenses, and of $-e$, s, $-e$, s, . . . for profits simply because production occurs in one period and sales in the next. But even if he were really intent on listening to all the noise of seasonally unadjusted data he would have to introduce variables into his model that would permit him to insulate that noise in the end. I understand that some of the techniques used to isolate seasonal influences within the framework of econometric models have been shown to be mathematically equivalent to the use of seasonally adjusted data derived by specified seasonal adjustment techniques.[16] This is another reason why I am skeptical of the proposition that econometric models would necessarily benefit from a seasonally unadjusted diet.

Synchronization

Another estimating problem, not noted by our contributors, should be mentioned. It arises in the preparation of the quarterly estimates even though in principle it affects the annual series also. It looms even larger in the preparation of the monthly GNP estimates that we have started. This is the problem of synchronizing the recording of economic transactions.

All parties involved in a given economic transaction must in the national accounts

[16] Michael C. Lowell, "Seasonal Adjustment of Economic Time Series and Multiple Regression Analysis," *Journal of the American Statistical Association* 58 (1963): 993–1010. For a discussion of this subject matter, see also George W. Ladd, "Regression Analysis of Seasonal Data," *Journal of the American Statistical Association* 59 (1964): 402–21, and A. B. Laffer and R. D. Ransom, "A Formal Model of the Economy for the Office of Management and Budget," mimeographed (1971). I am grateful to Albert Hirsch of OBE's econometric staff for a conducted tour through this literature and for the admirable self-restraint he displayed in dealing with a mathematical retardate.

report that transaction at the same time, or, if differences in timing are appropriate, these differences must be recorded systematically. If these conditions are not met, the accounts are thrown out of gear. Take, for instance, a sale by one business to another. When the sale is made, the item is removed from the inventories of the seller, causing an excess of debits over credits in the NIP account unless, as seems most unlikely, it is picked up at the same time in the inventories of the buyer. More probably, the error will be offset by an error in the opposite direction in a later period. The financial mirroring of the transaction is even more likely to be distorted. The financial assets and liabilities of the four parties involved—the seller, the buyer, the bank of the seller, and the bank of the buyer—are not apt to be properly synchronized until the check which the buyer has issued is returned to his bank.

Not enough work has been done to disentangle the rather complex timing discrepancies that may be involved and to formulate a consistent procedure for dealing with them; the primary data sources and estimating techniques to implement theoretical decisions are equally inadequate. The timing problem would be present even if each economic unit maintained a set of accounts based on uniform principles and reported its transactions for identical spans of time. Needless to say, this is not the case, and numerous additional inconsistencies of a cruder kind, as it were, are introduced for that reason.

To mention only two sources of potential error: our estimates of private wages are based upon reports that cover one week's operation each month, and even though every effort is made to infer from them wages for the quarter as a whole, there is really no assurance that these figures will be synchronized precisely with the corporate profits estimates, which are based on quarterly reports. Again, Government expenditures are reported on a cash basis, and in order to synchronize them with the business accounts of sales and inventories, they are put on a delivery basis with the aid of partial information. Obviously, this also may give rise to faulty synchronization.

Most of the statistical reporting systems upon which the NIP estimates rely have been set up for separate use rather than as part of an interrelated system; accordingly, the synchronization of these systems has not been a matter of special concern, nor was a systematic attack upon the problem possible in these circumstances. With the advent of the national accounts, especially in a less than annual form, proper timing became a matter of utmost importance, and at the same time a framework for working out a solution was provided. There is, of course, no assurance that work in this area will yield prompt and substantial returns. It is also apparent that the cost of improvements will be heavy. The only chance of success lies in a selective approach which tries to uncover and deal with the most acute problems.

Real Volume and Prices

I should like to draw attention to another set of estimating problems that requires more study, the measurement of real volume and the associated measurement of price. Its discussion in this section is arbitrary: it could have been handled equally well as "methodological research" under the heading of "Analysis." Because of its great complexity, the problem would have amply deserved the added dignity of such a classification.

GROVE calls for a reexamination of the deflators we use for fixed business investment, and KLEIN and ELDRIDGE call for better quantity and price data for foreign trade. In his bid for better construction statistics, TEPER probably means to include construction volume and prices. BURNS, LEWIS, and TEPER call for better measure-

ment of production and productivity in services and/or trade. The only standard item that is omitted from this menu is prices paid by government for business output; our contributors may have been charitable and omitted it because it is quite indigestible. DENISON, however, substitutes a well-prepared item in the government area, the specification pricing of labor services bought by government. But even if we add that, the listing is not complete. For example, any respectable list would have to have a reference to the prices of goods held in inventory. From the standpoint of OBE, the list, though seemingly diverse, has one unifying characteristic: we do not collect the basic price data for any item on it.

A great deal could be achieved by enlarging the collection of price data in areas in which present techniques, as distinct from budgets, are adequate. Beyond this, there is the more difficult problem of securing information on transaction prices rather than the list prices that now in part underlie the wholesale price index. But this initiative does not seem to involve major conceptual problems either.

The really difficult problems in the measurement of price and volume change arise when we are confronted with product change —the emergence of products of changed quality or of new products and the disappearance of old products. We adhere to the view that the real volume of output can reflect product change only as it is reflected in changes in real costs, and we would make a corresponding statement for prices.[17] But I do not want to shut my mind entirely to the proposition that we can go beyond this and measure "costless" product change.

There are also difficulties in the approach to which we subscribe. Most important, application of the basic principle implies a prior judgment as to whether a given product is the same as a preexisting product or is "new." Again, it is not clear whether the principle is to be applied if quality improvement is accompanied by a decrease in real costs (or quality deterioration by an increase in real costs). And there are many other questions that arise in the specific application of the general principle. Most of these are encountered by the BLS in the construction of the consumer and wholesale price indices. A detailed description of how they resolve these questions would be very useful to all who work in this field.

I would also find helpful a theoretical and empirical comparison of alternative techniques for measuring volume and price change in the presence of what I have called product change. I am particularly interested in a comparison of the method formulated by Denison, the multiple regression technique, the pricing of standard goods of unchanging specification, real or hypothetical, and the pricing of separate product components or of processes whose performance results in the production of the finished good. I suspect that all these procedures, and perhaps some others, really aim at the same results. I should like to see a theoretical clarification of this point and a discussion of the relative

[17] Edward F. Denison, "Theoretical Aspects of Quality Change, Capital Consumption, and Net Capital Formation," in *Problems of Capital Formation*, ed. Franco Modigliani, Studies in Income and Wealth 19 (Princeton, N.J.: Princeton University Press, 1957), pp. 215–84.

Recognition that we try to implement this principle is relevant in connection with R. J. GORDON's criticism of our assumptions about the prices of electronic computers. He does not document his statement, but he may be referring to an article by G. C. Chow, "Technological Change and the Demand for Computers," *American Economic Review* 57 (1967):1117–30. The measurements presented in that article do not seem to be based on the principle to which OBE and most experts subscribe, viz, that quality improvements can be quantified only to the extent that they are accompanied by real cost increases. After extensive consultations with representatives of the computer industry, OBE came to the conclusion that the convention it adopted was a closer approximation of the underlying concept it sought to implement.

advantages and shortcomings of the several methods when applied to the real world.

Guides to Methodology

It is evident from the entries in the table that our users are dissatisfied because we have not furnished enough information on the statistical sources and methods we use in making our estimates. Our users are right. We have in this respect fallen short of desirable goals. The only comfort I have is that the intensity of their dissatisfaction may be due to the fact that we have fallen from very high standards.[18] The only apology I have is that it takes a great deal of skill and effort to write good methodologies and that we have not been able to marshal the resources necessary to parallel our earlier efforts. Perhaps we should lower our sights.

One group of recommendations calls for tables that reconcile various series which are related but which differ either for definitional reasons or because of statistical inconsistencies. Such tables are extremely useful. In some cases they help to resolve puzzles, as, for instance, our table which shows how the Federal budget on NIP accounts is related to the unified budget and our table which shows how the corporate profits component of the national income is derived from corporate profits as defined and tabulated by the IRS. In other cases reconciliation tables serve as warning signals that something is going wrong: they tell us, for instance, that the manufacturing component of GNP and the FRB index of manufacturing production are having one of their frequent domestic disagreements and have decided on a trial separation, or that retail sales and personal consumption expenditures for goods have agreed to disagree.[19]

A large part of the resources that OBE devotes to the construction of the national accounts goes to this kind of comparison and reconciliation,[20] and we usually make good use of warning signals.[21] Our contributors are asking us to make more of this work available to the public. In this connection, I am intrigued by GROVE's recommendation that we discuss in our regular reviews of the GNP in the *Survey* the data problems we are encountering. We have done something along these lines—for instance, we have drawn attention to the widening of the statistical discrepancy between the product flow and income measures of the GNP in 1970—but perhaps we could go further.

The second set of recommendations is for complete written methodologies, like *National Income*, 1954 ed. I have already stated my case on this subject. Let me add only that I appreciate PARKER AND MAY's sensitive and knowledgeable description of how a methodology should be written, and that I assure KLEIN that our methodology will contain a discussion of the relative margins of error in the various estimates, along the lines of our discussion in *National Income*. If he believes it possible to go further in quantifying margins of error, I wish he would let us know how to do it. As we state in that publication, concepts borrowed from sampling theory cannot be applied to national accounting magnitudes that are the results of complex estimating procedures. Nor do we see sufficient objectivity in Kuznets' attempt of many years ago, which continues to be cited as evidence that margins of error can be quantified.[22]

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[18] See Office of Business Economics, *National Income*, 1954 ed.

[19] See "U.S. National Income and Product Accounts, 1966–69," *Survey of Current Business*, July 1970, p. 13.

[20] Contrary to the assertions of R. J. GORDON. To be specific, OBE has been devoting a major effort to the investigation of construction cost indices prepared by other organizations, and of this GORDON must be aware because he served as consultant to OBE on that project.

[21] Not always. We refused to heed a warning signal in 1955 and were proved wrong in 1958 (see *A Critique of the United States Income and Product Accounts*, pp. 521–22, and *U.S. Income and Output*, p. 76).

[22] Simon Kuznets, *National Income and Its Composition, 1919–1938* (New York: National Bureau of Economic Research, 1941), vol. 2, pp. 501–37.

DESIGN OF NATIONAL ACCOUNTS

It was convenient to cover all I have to say about the statistical sources and estimating methods underlying the national accounts in the preceding section on methodological issues. The following discussion of the accounts largely abstracts from these issues. The discussion of accounting design will take up the idea of a detailed and comprehensive national economic accounting system whose parts are related to each other in a disciplined and systematic manner through the application of accounting or similar techniques.

We are fortunate to have in this volume three significant contributions to this subject by DENISON, RUGGLES AND RUGGLES, and DUNN. I deliberately mention them in nonalphabetical order to bring out a progression from the very simple to the very complex. It was not possible to capsulize their ideas in a useful manner in tabular form. I shall try to summarize them briefly before commenting on them, but at the same time the reader is urged to turn to the statements themselves, not only because I may not have understood them fully, but also because the subject matter is difficult, interesting, and important.

DENISON regards the accounting framework as a pedagogical device that should be kept in its place, as it were, like children who should be seen but not heard. I suspect that he has developed this tolerant attitude especially for this festive occasion, for he has often come close to admitting to me that an accounting framework is something which he could do without, and knowing him I do not think that he has changed his mind. The RUGGLES [23] thesis is that the accounting framework is important for organizing data. They propose a simple system that permits the integration of microdata, which they believe are the wave of the future. DUNN is hardest to summarize. He definitely sees the need for a disciplined, interrelated system. As far as I can see, it would place less emphasis on broad aggregates than would RUGGLES; it would encompass a wider variety of data, and its construction would rely heavily on formidable matrix techniques.

DENISON, I believe, does not give national economic accounting its due. My personal experience leads me to value it more highly. In the first place, I think that national accounting is more than a pedagogical device for communicating insights that one has gained in other ways. I found the accounting framework heuristically useful in investigating complex consistency relationships (for instance, those involving the accounting for financial intermediaries) when I started to labor in this field many years ago, and it has been my potent secret weapon ever since. An interrelated structure of saving-investment accounts and balance sheets stands me in good stead when I try to trace changes in domestic financial flows, although I must admit that it does not carry me safely across the ocean when I try to follow the Eurodollar on its escapades. Also, there is an esthetic quality to a well-wrought accounting system whose parts are clearly related to each other. Finally, I do believe that in a complex world of statistical information a disciplined accounting system is as essential to the economist as Ariadne's ball of string was to Theseus in tackling the Minotaur in the Cretan labyrinth—or as a good filing system in my outer office would be to me.

RUGGLES proposes an accounting scheme which is not too different from that now used by OBE. It would have domestic sectors for enterprises, households, and governments; microdata relating to businesses and other enterprises, households and unattached individuals, and governmental units could be fitted neatly into the corresponding

[23] For reasons of simplicity only, I am dropping one Ruggles. Readers are cautioned to assign no gender to this editorial casualty.

broad sector. An accounting system of this type has a great deal of appeal to me because it conforms to the notion that the ultimate units of a national accounting system are individual transactors whose transactions are recorded in a set of accounts—to my mind, these are production, appropriation, saving-investment, and balance sheet accounts—and that it is the task of the national accounting system to consolidate the transactors and/or accounts so as to provide a meaningful summary picture of the economic process, i.e., the production, distribution, and use of output.

To me, the view of the economy that is provided by a national accounting system is similar to the view of the earth one gains from an airplane. We see the mountains, hills, valleys, plains, lakes, and oceans in clear outline, along with the rails, roads, and waterways that connect them. We see, if we look more closely (but we do not have to look unless we want to) forests and trees, snow, and sand. We see grazing cattle, houses, and factories, and boats, trains, and buses. The attraction of the work of a national accountant is that it allows one to try to paint a similar picture of the economy.

The special interest in the integration of microdata expressed in the RUGGLES article is compatible with this view, even if one is not as convinced as the writers are that microanalysis is about to carry the day. In fact, OBE's reconstruction of its income size distribution series, to which I shall refer later, and our desire—data permitting—to segregate nonprofit institutions from households proper are animated by a concern that is quite similar.

Many difficulties stand in the way of the execution of this scheme, but I believe that they can be solved. However, I do believe that the usefulness of the scheme hinges on the assumption that its elements can be viewed as enterprises, households, and governmental units. If this assumption were not permissible, I would have doubts.

The RUGGLES paper seems to reflect the belief that units other than those I have specified are important and the confidence that such other units can be worked into the system: "The reporting units for which microdata sets are collected may, obviously, be units other than individuals, households, enterprises, firms, or governmental budgetary units. Interest in the environment suggests that cities and regions may be appropriate reporting units." To me this proposition is not obvious; I hope that it does not represent the Achilles heel of an otherwise attractive scheme.

DUNN's contribution I find hardest to evaluate. Inasmuch as I shall express misgivings about many of its aspects, let me say that I enjoyed reading it and profited from it a great deal. It reflects an unusual degree of intelligence, sensitivity, cultural background, and artistic skill. Even though his central idea of the entity problem seemed elusive, some specific illustrations of it were quite suggestive. I was particularly interested in the connection that he draws between rapid social change on the one hand and set pictures of the economy, of the kind just sketched in connection with the RUGGLES paper, on the other.

If I understand DUNN correctly, rapid social change necessitates changes in the description of society that is provided by the national accounts and therefore makes set description obsolete. Perhaps there is an analogy here with the passing of bona fide representational art that we are witnessing. It has been replaced by abstraction, which seems to have some similarity to the information system of the future which DUNN sketches. I regret the passing of representational art and of its goal, the reproduction and interpretation of a real world in which there is common interest and concern. And I would be equally sorry if the corresponding function of national accountants—the drawing of pictures representing an economic process on whose major features there is general agreement—were becoming obsolete.

Just as I feel somewhat bewildered by abstract art, so do I feel bewildered by the information system of the future which DUNN

sketches. Its contents are not clear to me, and perhaps that must be so because in a period of rapid social change one cannot know what aspects of society will be most relevant. We must have a flexible, potentially all-encompassing system that will be able to accommodate whatever comes along.

Matrix notation plays an extraordinarily heavy role in DUNN's vision of the information system of the future, and this emphasis also puzzles me. For many years I have been thinking of matrices as a form of presentation alternative to T-account presentation that is sometimes more and sometimes less convenient. I have gradually realized that there is more to matrix presentation than that. But to give it as large a role as does DUNN strikes me as a substitution of form for content—of the medium for the message—which is perhaps due to the fact that the content eludes us because of rapid social change. I am not ultimately competent to assess the role of matrices, but I should like to see further discussion of it. It is a pity that it cannot be pursued by DUNN and RUGGLES in this volume. The RUGGLES paper seems much less sanguine about the benefit of matrix presentation than is DUNN.[24]

The Company-Establishment Problem

I should like to draw attention to the company-establishment problem because I believe that it is the single most important problem that is faced in the design of the national economic accounts. DUNN gives it some prominence but in my opinion miscasts it, making it appear as an intimate of the entity problem. DENISON refers to it also and admits candidly that he has no solution for it. Nor have I.

Essentially, the problem arises because for most purposes of economic analysis certain magnitudes are best reported on a basis in which the individual unit is the establishment. It is not easy to say why, but apparently there is a strong interest in production-oriented information that provides as homogeneous classifications of products and technologies as possible. But other associated magnitudes exist in a form in which the natural reporting unit is the company. For instance, for most purposes our industrial

[24] As is apparent from the above comments, I have not completed my study of accounting design. There have been many proposals, some of which strike me as the bad trips of users of Markov chains. The following quotation, one writer's description of an attempt to survey "the unimaginable universe," may bring into focus my misgivings about the all-inclusiveness which characterizes some of the proposed systems:

"I saw the teeming sea; I saw daybreak and nightfall; I saw the multitudes of America; I saw a silvery cobweb in the center of a black pyramid; I saw a splintered labyrinth (it was London); I saw, close up, unending eyes watching themselves in me as in a mirror; I saw all the mirrors on earth and none of them reflected me; I saw in a backyard of Soler Street the same tiles that thirty years before I'd seen in the entrance of a house in Fray Bentos; I saw bunches of grapes, snow, tobacco, lodes of metal, steam; I saw convex equatorial deserts and each one of their grains of sand; I saw a woman in Inverness whom I shall never forget; I saw her tangled hair, her tall figure, I saw the cancer in her breast; I saw a ring of baked mud in a sidewalk, where before there had been a tree; I saw a summer house in Adrogué and a copy of the first English translation of Pliny—Philemon Holland's—and all at the same time saw each letter on each page (as a boy, I used to marvel that the letters in a closed book did not get scrambled and lost overnight); I saw a sunset in Querétaro that seemed to reflect the color of a rose in Bengal; I say my empty bedroom; I saw in a closet in Alkmaar a terrestrial globe between two mirrors that multiplied it endlessly; I saw horses with flowing manes on a shore of the Caspian Sea at dawn; I saw the delicate bone structure of a hand; I saw the survivors of a battle sending out picture postcards; I saw in a showcase in Mirzapur a pack of Spanish playing cards; I saw the slanting shadows of ferns on a greenhouse floor; I saw tigers, pistons, bison, tides, and armies; I saw all the ants on the planet; I saw a Persian astrolabe; I saw in the drawer of a writing table (and the handwriting made me tremble) unbelievable, obscene, detailed letters, which Beatriz had written to Carlos Argentino; I saw a monument I worshiped in the Chacarita cemetery; I saw the rotted dust and bones that had once deliciously been Beatriz Viterbo; I saw the circulation of my own dark blood; I saw the coupling of love and the modification of death" (Jorge Luis Borges, *The Aleph and Other Stories, 1933–1969* [New York: E. P. Dutton, 1970], pp. 26–28).

classification of wages and salaries should be tabulated on an establishment basis, but the profits that arise in the activities in which wages and salaries are paid out are reported by companies.

This inconsistency is ensconced in the tabulation of national income by industrial origin, near the very heart of the NIP accounts, but it is not confined to them. Its ramifications are widespread. It raises difficulties for our series of gross product by industry and our input-output tables, where profits and some other components of value added (such as interest and depreciation), for which the company is the natural reporting unit, are allocated to establishments by procedures that are tenuous both conceptually and statistically. (This, incidentally, leads to inconsistencies that are not pretty between the national income tables on the one hand and gross product by industry and input-output on the other.) Furthermore, the company-establishment problem is at the root of the uncomfortable status of projects to measure gross product subnationally. And it leads to an apparently unbridgeable gap between breakdowns of the saving-investment and balance sheet accounts and the other more technologically oriented branches of the accounts.

It is distasteful to live with these inconsistencies, but no satisfactory solution is visible. One proposal is to bow to the present dichotomy in the primary data sources and to raise it to the status of a basic principle underlying the design of the accounts. According to one plan, the components of value added other than employee compensation would not be broken down further on an industry basis, and information on saving and investment and on balance sheets would not be classified industrially at all.[25] But this is not satisfactory. There is a great deal of interest in a full breakdown of incomes paid out in the various industries. Similarly, there is interest in the industrial patterns of saving and investment and the associated balance sheets. For instance, it is interesting to know that certain industries finance their capital requirements largely from internal sources, whereas others issue bonds and stocks.

At the other extreme is the proposition (or nightmare, depending upon whether one happens to be a data user or a data producer) that all information that is available on an establishment basis be made available on a company basis as well.

I do not believe that we should adopt either extreme without a further investigation of the issues involved. We should find out whether the difficulties in an establishment allocation of value added other than employee compensation are perhaps shared by items other than value added—for instance, some promotional activities and other activities that precede or follow production as narrowly defined. If this were the case, it would be worthwhile to study the allocation rules used by business to spread these items among establishments. More generally, we should find out more about the information systems that corporate management uses to gauge the profitability of establishments. Perhaps we can learn something from which we can benefit in constructing the national accounts. Last but not least, let us examine the quantitative importance of the problem. In industry situations in which it looms large, careful analysis might suggest appropriate solutions that might be quite expensive. Other industries might be swept under the rug by simple conventions: *de minimis non curat lex*.[26]

[25] This was the principle that underlay the first draft of the new System of National Accounts. It is still traceable by expert economic archeologists in the final version of the SNA, although it has been buried deep below the ground. See United Nations, Department of Economic and Social Affairs, Statistical Office, *A System of National Accounts*, Studies in Methods, Series F, No. 2, Rev. 3 (New York: United Nations, 1968).

[26] I have not discussed the possibility that increased diversification might play havoc with the usefulness of an industry classification of companies. This might be one more example of DUNN's entity problem.

Alterations and Minor Additions

Personal tax accruals	Ando
Improved measure of consumer interest	Denison
Services of dwellings industry	Denison
Economic depreciation	Denison, Eldridge, Jorgenson
Expense account outlays	Eisner
Capital gains	Eisner
Stock options	Eisner
Inventory change cross-classified by product and industry	Greenspan
Quarterly gross product cross-classified by major industry and final demand	Greenspan
Government purchases of fixed assets by structures and equipment; level of government; defense and nondefense; general government and government enterprises	Grove
Constant dollar Federal defense vs. nondefense, quarterly	Grove
Government purchases of goods and services, by object, quarterly; in constant dollars, annually	Grove
Constant dollar PCE by type, quarterly	Grove
Separation of wages from salaries	Grove
Employee compensation for time not worked	Grove
State vs. local outlays	Lewis
Gross corporate product	
Industry detail	Mennis
Unit labor cost and its elements	Mennis
More detail on housing	Eldridge
More detail on PCE, annually	Paradiso
Automobile and other consumer allocations	Paradiso
National expenditures for medical care, research and development	Parker and May
More constant weight GNP deflators	Salant

ALTERATIONS AND MINOR ADDITIONS

It is sometimes thought that national accountants have developed in their minds, displayed on their office walls, or stored in their desk drawers the blueprint of a comprehensive and detailed accounting scheme that is the product of some internal "logic," and that the bulk of their activities is and should be to fill in the empty boxes of this system, starting systematically from the more general and proceeding, I suppose, to the more specific.

The "Logic" of the National Accounts

This is a wrong-headed and dangerous concept of the role of the national accountant, as DENISON recognizes. I should like to second his remarks. No such blueprint actually exists; it is questionable whether it could exist even with respect to the broad components of the system; and it becomes obvious that no such blueprint can exist as we descend to detail. Once we have estimated investment in the State of North Carolina, we can proceed to estimate it in industrial detail. We can then estimate investment outlays made by redheaded organ grinders in that State. But clearly this is not a stopping point in the triumphal infinite progress

of the national accounts. Nor does the logic of the accounts provide sensible priorities either for the opening of new territories or for their subsequent intensive cultivation. If the formal logic of the accounts is stressed at the expense of more pragmatic considerations, it will turn into a will-o'-the-wisp that will lure us into a quagmire.

Some Pragmatic Considerations

In this table is grouped a long list of specific recommendations under the collective label "Alterations and Minor Additions." It is not a clean, logical list, but most of the items on it illustrate the many demands that are made on the national accountant to introduce comparatively small alterations and additions into the national accounts in order to render them more usable. Most of these demands are well-founded and, in my opinion, will show greater returns than many other more ambitious projects which are less well attuned to the needs of realistic economic analysis.

I do not intend to give a complete evaluation of the recommendations, nor do I propose to add to them a list of my own. But I do want to make selective comments, partly to illustrate what I have in mind. I am sympathetic to ANDO's call for a series on personal tax accruals as a companion to the present tax payments series; I would add that we should also supply a series on corporate tax payments, to accompany our present accrual series. There are many who would like information on corporate tax payments, even though our contributors happen not to have made such a recommendation. Both supplementary series could be prepared without a great expenditure of effort.

DENISON's request for the establishment of a separate services of dwellings industry is another recommendation that springs from the needs of hardheaded economic analysis. The separation of wages from salaries and of State from local budgets, recommended by GROVE and LEWIS, respectively, is in a similar category. We have prepared estimates separately for wages and salaries in the manufacturing industries in the past, as well as separate estimates of State and local expenditures. The resources required to make them are not prohibitive. MENNIS' recommendations for more industry detail on corporate gross product and for the partitioning of the unit labor costs of corporations into productivity and wage rate factors appeal to me also. Silence about the other proposals does not necessarily mean that I consider them unimportant or am adverse to them.

FOUR MAJOR PROGRAMS

In this section I shall respond to recommendations relating to four major OBE programs. These are summarized in the table below.

Size Distribution of Income

OBE's income size distribution series had to be discontinued in 1963 because funds necessary to maintain it in good working order were lacking. It was not possible to incorporate new data sources and estimating techniques that had become available since the methodology underlying the series was established in 1953.

Because it was controlled to income totals taken from OBE's personal income, the OBE size distribution was integrated with the NIP accounts and had the advantage of covering all income, in contrast to the source data which omitted substantial amounts of cash income and, of course, income in kind. The OBE series had two major shortcomings. It was not possible to reconcile it clearly with the income size distribution sample survey conducted by the Census Bureau [27]—a major data source—and it was thin in informational content. The breakdown of the series was confined to separate distributions for farm families, nonfarm families, and unattached individuals. This information could not be linked to the rich socioeconomic detail that was available in the Census sample survey.

[27] U.S. Bureau of the Census, *Current Population Reports*, Series P–60 (Washington, D.C.: U.S. Government Printing Office).

Four Major OBE Programs

Income size distributions	
Reinstatement of OBE estimates	Lebergott, Lewis, Paradiso, Salant
Role of transfers and gifts	Parker and May
Life profiles of family incomes	Salant, Samuelson
Size distributions of wealth	Salant
Subnational accounts	
Publication of county estimates	Poole
Regional NIP accounts	Greenspan, Poole
Interregional balance of payments	Salant
Input-output accounts	
Description of methodology	Carter and Leontief
Greater industrial detail	Carter and Leontief, Hoadley
Annual tables	R. A. Gordon, Greenwald, Grove, Mennis
Reduction in publication lag	Carter and Leontief, Grove
Improved treatment of secondary products	Carter and Leontief, Greenspan
Full bridge table and price information	Carter and Leontief
Incorporation of capital and/or labor requirement	Carter and Leontief, Gainsbrugh
Incorporation of nonaccounting information	Carter and Leontief
Capital flow table	Greenspan
Regional accounts	Carter and Leontief
Balance of payments accounts	
Presentation of balance	
Focused on reserves	Roosa
Neutral	Bernstein, Dale, Kindleberger, Salant
Monetary balance	Bernstein
More industry and regional detail on foreign plant and equipment survey	Greenwald
More bilateral balances	Burns
More information on Eurodollar market	Roosa
Foreign direct investment and related data	
Speedup in publication	Salant
Data system and analysis of international operations of U.S. business	Burns, Brimmer, Eldridge, Greenspan
More data	
Foreign direct investment	Greenspan
Sources and uses of foreign direct investment affiliates	Greenspan
Quarterly U.S. international investment position	Greenspan

In undertaking a reconstruction of methodology, we have aimed at a clear reconciliation with the Census series. This made it possible to replicate in the distributions adjusted to full income coverage the socioeconomic detail contained in that series. Furthermore, we have attempted to apply the necessary adjustment factors separately to members of the basic sample rather than to

frequency distributions of these members. This procedure has substantial methodological advantages and is useful also from the standpoint of analysis, along the lines of RUGGLES' call for microdata encountered earlier.

The budgetary situation which forced the suspension of the OBE series in 1963 has not changed. It has been difficult to eke out the funds necessary for the methodological reconstruction, and this has impeded our progress. Another cause of delay is the fact that we have been developing a new technique in the adjustment of sample size distributions to full income coverage and that we are trying to do the job with extreme care. Barring unforseen difficulties, we shall be able to complete the basic methodology. However, the organizational and financial arrangements to secure establishment and regular publication of a new time series have not yet been worked out.

Subnational Accounts

The recommendations for subnational accounts move me to a different kind of comment. A great deal of thought needs to be devoted to the questions of what types of accounts are appropriate at a subnational level, what data are available to implement the recommended accounts, and what would be the cost of securing the necessary source data if they do not exist. I would want to investigate each of these points further before the estimation of regional NIP accounts recommended to us by GREENSPAN and POOLE and of interregional balance of payments accounts recommended by SALANT is undertaken.

Input-Output Accounts

The recommendations for input-output are comprehensive indeed, thanks mainly to the thorough contribution of CARTER AND LEONTIEF. If anything, the input-output program recommended is somewhat too extensive, in my view. We are perhaps on the brink here of what was described above as the syndrome of pursuing the logic of the accounts instead of paying heed to the practical needs of economic analysis. For instance, OBE having produced a 478-order table, I am not really sure that the recommendation for further industry detail deserves high priority.

The only significant recommendations that are missing, in my opinion (in addition to the tasks connected with the company-establishment problem discussed earlier), are for the dynamization of input-output tables, including further work on input-output coefficients. These are unusually difficult tasks, but, as GREENSPAN recognizes, they need to be tackled if input-output is to be rendered useful in short-term economic analysis. In such analysis, the static treatment of inventories is the major blemish. Further work on input-output coefficients is closely related: here investigation is needed of differences between marginal coefficients that hold in the short run and the average coefficients reflected in the input-output tables.

One of the most interesting recommendations is the incorporation in input-output tables of what CARTER AND LEONTIEF call "non-accounting" data. Input-output can be used in the study of environmental change, for instance, to trace the effects of changes in final demand on pollution and in many other ways that come to mind if one ceases to think of input-output tables as value links between final markets and industry value added.

Balance of Payments Accounts

There were many recommendations for our balance of payments work. I shall comment on two groupings of them: those that relate to the definition of the balance of payments surplus or deficit and those that relate to information on U.S. direct investment abroad.

Definition of Balance of Payments Deficit

With differences only in their degree of emphasis, our contributors point out that

the payments balance cannot be represented by a single figure and that the presentation of a wide variety of balances is more conducive to the analysis of our balance of payments position. Ideally, perhaps no balance should be published at all. I find it interesting that those who hold that the U.S. is a financial intermediary to the world, and from that position argue that the conventional definitions of the balance of payments deficit give too unfavorable a picture of the U.S. balance of payments position, particularly favor a neutral balance of payments presentation instead of proposing one that tries to quantify their theoretical position.

I also note that, judging from the small sample at our disposal, journalists (SLEVIN abstaining) are unanimously in favor of doing away with any presentation of the balance of payments deficit. KINDLEBERGER should apologize to DALE.

I myself am strongly in favor of neutrality. Several factors seem to conspire to make the definition of a payments balance an impossible task. The very notion of a dynamic balance of payments equilibrium is elusive, and balance of payments adjustment theory is torn by internal dissent. To make matters worse, even the view that ex post magnitudes can be used as though they were ex ante is allowed to infiltrate. (In the realm of the GNP accounts, short shrift would be given to a fifth column which spread the view that the presence of expansionary or deflationary tendencies would be visible in an imbalance between saving and investment in the saving-investment account.)

Having witnessed over the years many attempts to define and redefine a payments balance—attempts whose only visible progression was circular—I have often felt that all definitions of a payments balance should be abolished, with a fine shout of "a plague on all your houses." However, in more sober times, I am restrained from this view by two considerations. The first is pragmatic: the bulk of our users will want definitions of the balance of payments surplus or deficit. The second point is more important and is voiced in KINDLEBERGER's perceptive contribution. Any presentation of our international transactions, whether a final balance is struck or not, requires some underlying theory. We have latitude only as to kind and degree.

Seen from this vantage point, the presentation of alternative balances can certainly be justified and is likely to be helpful. I hope that the new presentation of the balance of payments in the June issue of the *Survey*, which was worked out under the aegis of the Office of Management and Budget and represents a compromise among the views of the several interested agencies, has been in the right direction, and I am not surprised that the rationalization of the various balances in the accompanying article is not more forcible than it is. I am pleased that BERNSTEIN, who has seen the new format, thinks it a great improvement and even more that he spells out the basic objections against the new balance on current account and longterm capital we have introduced.

U.S. Direct Investment Abroad

GREENSPAN complains about the "relative paucity of information on U.S. foreign direct investments," while ELDRIDGE says, "In the field of direct investment, the U.S. has far outdistanced the rest of the world with respect to the completeness and detail of its data and the variety of subjects covered." GREENSPAN and ELDRIDGE mean to convey the same message. They, and many other of our contributors, mean to remind us that the publication of the results of the 1966 Survey of U.S. Direct Investments Abroad has been unduly delayed and to admonish us to get on with the job and to take steps so that in the future information on U.S. foreign direct investment is

properly organized and is made available to the public on a timely basis. We accept the criticism; we had begun to implement the recommendations before they were made.

Our experience with the 1966 survey has been frustrating. For several years we could not obtain funds to conduct it. Our pending appropriation request, which was too low from the outset because it was based on our experience with the 1957 survey, was eroded by inflation. The questionnaire we formulated incorporated the requests for information by many agencies other than OBE and, partly for that reason, became extremely detailed. It turned out that the number and complexity of the returns far exceeded our expectations. Also, differences which needed to be investigated developed between OBE data on foreign direct investment and data collected by the newly established Office of Foreign Direct Investment. And, at least during part of our labors, we were dogged by expenditure and employment ceilings.

We hope that the log jam has been broken. The first report on the survey has been published. More important, we hope to organize a data system incorporating not only the 1966 survey but also other direct investment data and other information on the foreign activities of U.S. corporations and of their foreign affiliates. If we succeed in this project, we shall have gone a long way toward compensating our users for our past shortcomings.

SAVING, INVESTMENT, BALANCE SHEETS

These recommendations fall naturally into three groups: those relating to saving and investment, those relating to OBE's capital stock study, and those relating to the preparation of balance sheet accounts. The three are obviously interrelated, but the first group contains most of the major recommendations for changes in the definition of saving and investment, and I shall concentrate on it. In listing the recommendations under this heading I have erred on the side of detail rather than consolidation, even though the recommendations sounded similar, because in many cases I was not sure what their exact content was.[28]

Sector Saving-Investment Accounts

I greatly favor KLEIN's, LEBERGOTT's, and LEWIS' recommendation for integration of the flow of funds with the NIP accounts and the similar recommendation of ELDRIDGE, KENDRICK, and RUGGLES for sector saving-investment accounts to accompany the NIP accounts. Much has been done toward an integration of this type since M. A. Copeland initiated the flow of funds work at the FRB in the mid-forties. In general, the trend has been toward the concepts, definitions, and classifications used in the NIP accounts, but there have been exceptions. It should not be too difficult to iron out the remaining differences, given a clear go-ahead and a relatively modest amount of resources.

Depreciation

I also favor DENISON's, JORGENSON's, and ELDRIDGE's recommendation that measures of economic depreciation be incorporated into the national accounts. I do so in spite of the many unresolved problems pertaining to service life, patterns of depreciation over given lives, and valuation which stand in the way of depreciation estimates that are completely meaningful from an economic standpoint. DENISON's specification of how the new depreciation estimates could be allocated industrially has removed a road block. I do remain concerned, however, about

[28] Three interesting aspects of the definition of saving and investment—entrepreneurial saving, a "gross-gross" definition, and the treatment of margins arising in secondhand transactions—are not mentioned by our contributors. Those interested can find an introduction to them in my paper, "The Conceptual Basis of the Accounts," pp. 28–29, 81–84, 92.

Saving, Investment, and Balance Sheets

Saving and investment	
Sector accounts	Eldridge, Kendrick, Ruggles
Integration with flow of funds	Klein, Lebergott, Lewis
Current and capital account for government	R. A. Gordon
Economic depreciation	Denison, Eldridge, Jorgenson
Reassessment of distinction between consumption and investment	Teper
Treatment of government durables as investment	Eldridge, Goldsmith, Kendrick, Ruggles
Treatment of consumer durables as investment	Ando, Eldridge, Goldsmith, R. J. Gordon, Kendrick, Ruggles
Measurement of educational services constituting both investment and consumption	Eisner
Investment in and return to human capital	Samuelson
Measurement of intangible investment	R. J. Gordon, Eisner, Kendrick, Ruggles
Measurement of additions to natural resources	Eisner
Balance sheets	
Private	Jorgenson
National and sectoral	Burns, Gainsbrugh, Goldsmith, Kendrick, Lewis, Paradiso
OBE capital stock study	
Where-used classification	Gainsbrugh
Coverage of all private stocks	Jorgenson
Coverage of all stocks	Gainsbrugh, R. A. Gordon
More industry detail	Gainsbrugh, Greenspan

the choice of the service life assumptions and of the depreciation formula (straight line or accelerated).

Consumer and Government Durables

There is widespread demand for the treatment of consumer durables and durables acquired by government as investment. It is regrettable that, just as in the literature on this subject, the pros and cons of this recommendation are not spelled out. An attempt to do so reveals the cause of this omission: it is very hard to state a logical and convincing case. Once we depart from a definition of investment as business expenditures not charged to current expense, we do not seem to have a firm underlying concept whose application will resolve the major decisions about coverage that need to be taken.

I do not feel strongly about the classification of consumer and government durables. On balance, I favor their classification as investment, in spite of some disadvantages associated with this treatment. Among these disadvantages are statistical difficulties in measuring government capital formation and the associated depreciation and retirements; complications that would be introduced into the presentation of the Federal budget surplus or deficit on NIP account, which in its present form is a useful summary measure of the impact of fiscal policy; and possibly the generation of a view that it is more productive to channel public spending into durables, because they are investment, than

into nondurables and services, which are consumption.

An important argument in favor of the treatment of consumer and government durables as investment is that there are many good reasons for wanting to have information on the stocks of these goods. Given this purpose, their treatment as investment provides the only neat integration of saving-investment and balance sheet accounts. Also, recognition of consumer and government durables as investment would permit cleanup of a dark and messy corner of the NIP accounts, with which only their most intimate custodians are fully familiar—the treatment of intersectoral transactions in secondhand assets. (In spite of his Holmes-like qualities, R. J. Gordon has not yet penetrated all mysteries.)

Full implementation of the proposal to classify consumer and government durables as capital formation requires in principle not only estimation of depreciation on stocks of such durables (by which consumption, government purchases, and total GNP would be raised) but also estimation of a net rate of return on such investment (which would further change consumption and government purchases, GNP, and net national product and national income).

This is the part of the exercise that gives me pause. In the case of consumption, we have no viable market analogy to establish a net return, as we have, for instance, for our farm or residential imputation because there is a broad market for farm output and rental housing. For consumer durables, market analogies would be tails wagging dogs. For most government assets the situation is even more hopeless. The sound purpose of imputing a rate of return to government capital is to approximate its productivity in a manner similar to that in which the aggregate of property-type incomes in the private sector approximates the productivity of privately owned capital. Since the estimation of such a rate of return is obviously impossible, and since the obstacles in the way of the calculation of a meaningful return on consumer durables are overwhelming also, I would propose that we stop short of this nonfunctional addition to the structure of the national accounts, even though their inherent logic may demand it. Let us be guided by Georg Wilhelm Friedrich Hegel, who once said that "only oxen are consistent."

Intangible Capital Formation

The measurement of intangible capital gets some support. R. J. GORDON, EISNER, and KENDRICK are joined by RUGGLES. I must raise an eyebrow at the last-named commentator, or rejoice in his exuberance—I do not know which. Not so many years ago Ruggles did not want to treat even consumer and government durables as investment. I see grave difficulties, conceptual and statistical, in the way of estimating gross intangible investment and the associated depreciation and retirements under each of the headings of service life, pattern of depreciation, and valuation. I believe that these difficulties can be solved only in the light of a much more hardheaded discussion than is available now of the uses to which these estimates will be put.[29]

Natural Resources

I find the other major initiative we are asked to undertake in this area, the measurement of additions to natural resources, proposed by EISNER, equally difficult. In spite of considerable thought and study, we at OBE have not found a useful way of tackling this subject and are receptive to suggestions that might put us on the track.

Balance Sheets

I have no comments on the recommendations that relate to our capital stock estimates or the preparation of balance sheet

[29] Is not the desire to treat human beings as investment and at the same time to treat the goods and services they use up as final output (consumption) somewhat schizophrenic? Would we not run into difficulties if we tried to design an accounting system in which fodder is classified as final consumption? Ricardo defined the net revenue of a country to exclude the subsistence of the working class (see David Ricardo, *Principles of Political Economy and Taxation*, ed. E. C. K. Gonner [London: George Bell and Sons, 1903], pp. 336, 414).

Consumption provided by business	Ruggles
Value of services of TV, radio, and newspapers to consumers	Okun (No), Ruggles
Value of housewives' services	Eisner, Kendrick, Okun (No)
Value of volunteer work and school work by students of working age	Kendrick
Measurement of expenditures to control environment	Denison, Parker and May
Deduction of "regrettable necessities"	Okun (No)
Transformation of GNP into welfare measure	Lekachman, Okun (No)
Net product that excludes costs of maintaining environment	Lewis
Accounting for negative aspects generated in the course of production	Teper
Reaserch in measurement of socioeconomic assets and costs	Burns
Value of leisure	Okun (No)
Services provided by consumer and government capital	Eisner
Broad redefinition of income and product	Eisner
Broad changes in treatment of final consumption, private and public	Kuznets
Measurement of productivity in government sector	Ando, Burns, Lewis
Construction of measure of social progress	Hoadley
Work on nonmarket dimensions of national welfare	R. A. Gordon
Allocation of nonmarket time	Eldridge
Supplementary indices of social welfare	Ando, Grove, Parker and May

estimates. They seem well taken, and the latter open a vast new subject which it would not be possible to discuss constructively in these comments. I do want to say, however, that GOLDSMITH's timetable for what he calls a shortrun program is based upon an incredible estimate of productivity. I shall not use this estimate to schedule our work in this field, but shall most assuredly use it if ever I am forced to impute in the national accounts a productivity factor to Government workers.

CONSUMPTION

The previous section, which discussed recommendations to change the definition of investment, had some bearing on the definition of consumption as well.

Imputed Consumption and Investment

Changes in the definition of investment affect the definition of consumption for two reasons. First, they imply in most cases a reclassification of items from consumption to investment: for instance, if consumer durables are classified as investment, they cease to be consumption. The classification of an item as investment implies, as we have seen, the imputation of a rate of return on it (depreciation and a net rate). The imputed rate is added to consumption, and this is a second reason why changes in the definition of investment entail changes in the definition of consumption.

In contrast, there are many changes that can be made in the definition of consumption that do not lead to a redefinition of investment. For instance, if we decide to include the free meals received by a restaurant worker in his consumption, as we do in the national accounts, we raise consumption by the amount of the imputation without changing investment. Changes of this kind in the definition of consumption will be taken up in this section.

The proposed imputations range from those involving limited changes in the definition of consumption now in use to those

involving broad changes including, as we shall see, not only imputations but also amputations. The former kind of change is, in a manner which I shall try to explain below, closely tied to our market economy. The latter kind attempts an ambitious takeoff from the market economy. The technological feasibility of such a takeoff has not been demonstrated. As a background for the discussion of these matters, we need to examine the existing tools of national output measurement.

Operational Definition of Final Product

National output as the sum of final products can best be characterized from an operational standpoint as the sum of purchases not charged to current expense by business.[30] As has been noted, a first approximation of investment as it is usually measured can be obtained by summing the business purchases not so expensed; and what we commonly mean by consumption, broadly defined, can be equated roughly to the remainder of the final product and consists of consumer and government purchases.

To be sure, this operational rule is not profound in the sense of expressing the ultimate goals of measurement. But it is valuable and important because it tells us in a clear, frank, and unadorned manner what we actually do when we measure the bulk of the national product. Recognition of the rule helps to keep our feet on the ground.

This rule is quite compatible with the view that national output is and should be related to welfare—that it is designed to measure goods and services that satisfy human needs, or however one wants to put it. But broad agreement on this kind of definition has not prevented or settled broad disagreements as to the possibilities and limitations of output measurement. This fact has convinced me that the repetition of these generalities serves no useful purpose. There is little practical purpose in opening a conference on the problems of juvenile delinquency with a formal restatement of one's opposition to sin.

Since a statement of the ultimate goals of measurement leaves open so many questions on what should actually be measured, one must have an operational definition that provides a firmer guide. I have found the operational definition of national output which I advance eminently useful. It focuses on the tools that are actually used to construct national output totals. In this way, it helps to bring out clearly the nature and limitations of these totals and suggests the need for the provision of alternative tools if totals are to be obtained to serve needs very different from those to which the existing measures are adapted.

Lest there be misunderstanding, I hasten to qualify the operational rule. In the first place, it must be construed to cover transactions of types to which accounting rules are applicable, even though in practice the transactors do not apply them. The transactions of small business enterprises that do not maintain adequate books are a case in point. Second, we are not satisfied in all instances with the final product total that would result from the unmodified application of the rule, or with the consumption-investment classification to which it would lead. In the attempt to improve the measure of total output and its breakdown, we make what are in effect important modifications in the rule.

The above qualifications relating to the rule are, in my opinion, important and valid. The following one is not. It has been said that the rule is empty and question-begging because two of its terms, "business" and "charging to current expense," have not been defined. Aggregates of widely different size and composition are obtained, it is argued, depending on how these terms are defined. The present OBE total follows from one set of definitions, but if government were defined as business and the elements of the budget statement were transformed into a profit and

[30] This section is largely a repetition of my comments in "The Conceptual Basis of the Accounts."

loss account, the rule would yield a total that is vastly different. Yet another radically different version of final product would result if households were defined as business and their consumption regarded as production expense.

It seems to me that these possibilities do not invalidate the statement that the rule is operational. After all, there is a large measure of agreement as to what a business actually is and what is meant by charging to current expense. All definition has to start with some background of agreement which one does not question—otherwise infinite regression would ensue—and I do not see why one should not rely on such "commonsense" in this instance to formulate a definition of national product that is closer to actual practice than are most definitions of similar generality.

Commonsense of Imputations

In estimating the personal consumption component of the national product, we do not confine ourselves to actual consumer purchases, as would be suggested by the operational rule. We also include several items of imputed consumption: food, clothing, and shelter furnished directly to employees; food and fuel produced by farm entrepreneurs for their own use; the services obtained from their houses by owner-occupants; and, finally, the services rendered without explicit charge by financial intermediaries. What is the rationale of this practice, and why is it useful?

I should like to suggest at the outset that it is not possible to formulate a definition of consumption, superseding the operational definition already cited, that would explain the actual imputation practice in the sense that all imputations made would follow from that definition and no imputations not at present made would be called for by it, nor do I think it possible to formulate a definition that would suggest a reformed imputation procedure conforming to these requirements.

I think there is agreement on the point that such definitions do not now exist. But my contention is a more sweeping one, namely, that they cannot be invented. A statement of this type cannot be proved, but in the present case a strong presumption can be established: I refer to the impressive record of failure to rationalize the existing imputation procedure or to develop a reformed one that would pass the test. Good and clever men have striven toward these goals since the dawn of national income measurement, and the fact that they have not attained them suggests that they have been pursuing a will-o'-the-wisp. [31]

Even though imputations cannot be made to flow from a clear-cut rule, they are an auxiliary construction of national output measurement which adds greatly to its usefulness. The imputation for wages and salaries in kind takes cognizance of the fact that such compensation is taken into account in the wage bargain. The farm imputation ensures the farm entrepreneur an adequate place on the income scale. The rental imputation prevents a shift between tenant and owner-occupied housing from affecting national output in a manner that would be awkward for most kinds of economic analysis. The financial imputations prevent the emergence of a negative value added for banking, a result that would please only an enemy of the free enterprise system. These and many specific arguments can be used to uphold imputations without once invoking the spirit of welfare.

Imputations may be compared with additions made to a house in order to adapt it to the particular needs of a family. These often destroy architectural unity, so that it is no longer possible to characterize the ground plan by a simple reference to the general plan to which all houses of this

[31] For a thoroughgoing attempt, see Irving B. Kravis, "The Scope of Economic Activity in International Income Comparisons" and my discussion of his paper in *Problems in the International Comparison of Economic Accounts*, ed. John W. Kendrick, Studies in Income and Wealth 20 (Princeton, N.J.: Princeton University Press, 1957), pp. 349–400.

particular style conform. It becomes necessary to explain that the playroom was added because the children needed it and that it is an awkward shape in order to preserve the old oak tree beside the house which the family was unwilling to have cut down; that the year the rather ugly second-story addition was made funds were lacking for the more expensive alternative of extending and finishing the basement, and so on. Explanations of this sort are not elegant, and they may even demonstrate instances of bad judgment. But the extensions to the house themselves were made in response to genuine needs and have probably added to its comfort and usefulness.

Each of the current imputations has been adopted on the ground that it adds to the usefulness of the data in economic analysis. However, one should not overargue the case in favor of any specific set of imputations because the wisdom of making them must be judged primarily in terms of concrete problems of economic analysis. There will always be legitimate disagreement as to particular imputations that are now made and as to whether new imputations should be added. On the latter point, I want to offer a warning: it is advisable to exercise restraint and to add imputations only if their need is strongly felt. The problems involved in the valuation of imputed items are large. More important, perhaps, it is reckless to sail too far out into an uncharted sea whose only shore is the one from which we have decided to cast loose.

Limited Imputations

Seen in this light, I have no quarrel with the kinds of imputations suggested by RUGGLES, and I do not share OKUN's strong negative reaction to one of them, the imputation of a value to consumers of television and radio services.[32] In the accounts as now constructed, television and radio are not included in the final product because they are a business expense. They are, of course, included in the current-dollar value of final product as a cost element, but this fact is irrelevant in the present context. What matters is that they are not included in real product, i.e., in current-dollar product corrected for price change. A shift of resources from goods and services purchased by consumers in the market (say, film and legitimate theater) to the provision of television and radio programs will result in a reduction of total real consumption.[33]

Surely one cannot assert that those who dislike this result have no case whatsoever, nor can it be argued that it would be impossible, or even overly difficult, to satisfy them. It would be within practical reach to obtain information on the size of the advertising budgets that pay for television and radio programs, and these data would provide the value of the imputation that should be added to consumer expenditures (and incomes).

Accordingly, I cannot take a dogmatic stand on imputations. I do say, however, that they should be used sparingly. They should be justified on the basis that there is an actual need for them in realistic economic analysis, rather than on the basis of a blanket invocation of a general concept of welfare, which I do not believe exists. If we do not muffle our ears to the siren song of imputations, we shall find ourselves imputing for the value of the domestic work performed by housewives, then perhaps for the time that fathers spend helping their children with homework, then for parties we give, then for the value of the tunes that men eager to sally forth to their daily pursuits sing in their showers. But do let us take hold of ourselves. It would be very difficult to gather information on the time so spent, and it would be painful to decide whether to impute to this time the salary rate of a leading tenor at the Metropolitan or that offered a tone-deaf person in the music market. It would be a great mistake if, by a

[32] As Ruggles points out, newspapers, magazines, etc., fall into the same group.

[33] For the sake of simplicity, I omit a similar statement for a situation in which there is a change in the total productive resources utilized.

string of flimsy imputations, we gave GNP the aspect of an overdecorated Christmas tree.

ENVIRONMENT

The role of environment in output measurement has become a matter of general concern. Everybody talks about it but nobody does anything about it. In my opinion, DENISON [34] and PARKER AND MAY give us the right clue. In view of the importance of the problem, I should like to summarize my own views, which I believe accord in large part with Denison's.

The Need for Information

There can be little doubt that in the years to come public and private policies dealing with the environment will be formulated and carried out on an increasing scale. If economic statistics and analysis can contribute to national policy formulation and effective policy execution, the case for the entry of our profession into this field can be made for reasons other than that of abstract concern about the measurement of welfare. As will appear from the subsequent discussion, I do believe that we can make a significant contribution, and, accordingly, I have no qualms of the type I voiced in connection with a wanton extension of imputations.

Objections to Present Treatment

Let us briefly review the reasons why the present treatment of environmental change in the national accounts is considered unsatisfactory and what can be done to improve the present state of affairs if it does need improvement. First, changes in the environment per se are not reflected in GNP: for instance, the direct effect on human beings of inhaling dirty air does not appear in GNP. For the sake of simplicity, assume an economy devoted entirely to the production of bread. If in such an economy increased production of bread were accompanied by increased air pollution, GNP would record the former but would not contain an offset for the latter. Second, GNP behavior vis-à-vis environment may be deemed unsatisfactory because of the manner in which expenditures to protect the environment are reflected in GNP.

Note the distinction between "environment" in the first case and "expenditures to protect the environment" in the second. This distinction is the sine qua non of clear thinking in this field.

To explain the second point, it is necessary to understand how expenditures for the protection of the environment affect GNP. Suppose that, in the simple bread economy, government or consumers divert to the improvement of the environment some of the resources hitherto engaged in the production of bread. The number of loaves of bread produced and consumed decreases, but there is an offsetting entry for expenditures on environmental services, either under the heading of government purchases of goods and services or under personal consumption expenditures, and total GNP is unchanged. If, however, the same protective expenditures are incurred by business, the reduction in bread production is not offset by any other entry in GNP, and total GNP decreases. The behavior of GNP vis-à-vis environment-protecting expenditures incurred by business can be regarded as unsatisfactory. The nature of the dissatisfaction can be expressed by the proposition that a decision to shift resources to the protection of the environment should not result in a reduction in the measure of the Nation's output. Alternatively, and more concretely, it can be said that the improvement in the conditions of living that

[34] See also Denison's "Welfare Measurement and the GNP," *Survey of Current Business*, January 1971, pp. 13–16, 39.

stems from a better environment should be accounted for.[35]

Costs of Environmental Protection

I shall first address myself to the problem raised by the behavior of GNP in relation to environmental expenditures, reserving comment on its behavior in relation to the environment. Before considering measures to rectify the situation, however, let me say that I am not quite sure that there is anything in the behavior of GNP that should be rectified. I can think of other shifts in expenditures that result in possibly misleading changes in GNP: for instance, for reasons similar to those which have been given, GNP decreases or is held down if business increases expenditures to improve conditions of work. It may be said that two wrongs do not make a right, but one can cite many other examples of a misbehavior of GNP. They have a common root in the fact that GNP is a measure which reflects the institutional structure of our market-oriented economy. Perhaps many wrongs do make a right—the reader is reminded of the butter-knife analogy used earlier, in the discussion of the statistical accuracy of the GNP estimates. But let us grant that the GNP estimates in themselves, without further information to interpret them, are misleading when environmental expenditures are incurred by business. What can be done to improve the present state of affairs?

The answer that immediately suggests itself is to measure expenditures incurred by business to protect the environment and to use them as supplementary information to interpret movements in GNP or to add them to GNP, as presently measured, as a new imputation.[36] The task, stated thus broadly, seems straightforward conceptually, and there is a strong inclination to regard it simply as a mammoth data collection job. But this view is deceptive.

There are grave difficulties in the definition of "environment" which need to be resolved before expenditures to protect the environment can be measured. At least as important, it will not be easy to define these expenditures even after the scope of the environment has been defined. Several major obstacles become apparent as soon as one starts thinking about the matter. Many more will emerge as we think further. No catalogue of them exists as yet, but it will be helpful to indicate some of them so long as they are not taken to be a complete list.[37]

In the first place, there are expenditures incurred by business about which consumers do not care per se. For instance, a firm located upstream pollutes a river whose water is used by a firm located downstream. The latter incurs environment-protecting expenditures for purifying the water because its technology requires clean water. The river is not used by consumers for recreational purposes, nor does it affect their living conditions in any other direct way. It would seem that expenditures of this type should be omitted from the imputation.

Second, there may be what has been called a "base line" problem. Some believe that in logic it would be necessary to measure expenditures from a base line that is

[35] It is sometimes thought that the above propositions are valid only if the expenditures incurred by business are current expenses (employee compensation and other forms of income and intermediate products) and that they do not hold if the expenditures are for capital goods. In that case, reduced bread production is offset by an increase under the heading of fixed business investment, and total GNP is unchanged. This argument is fallacious. The fallacy can be seen most easily if we recognize that, in the latter case as well, GNP would not record what we have called the improvement in the conditions of living. Alternatively, consider two situations in which labor and other current resources are diverted from the production of bread to the production of equipment that will result in either (a) an increase in bread production or (b) an improved environment. GNP during the time span in which the equipment is used will be larger under (a) than under (b) because it will record the increased bread production but not the improvement in the environment.

[36] I shall not go into the pros and cons of this choice except to say that it is of secondary importance. In either case, we need to distinguish between outlays on capital equipment and on current expenses, including depreciation on equipment designed to protect the environment.

[37] Denison and Orris C. Herfindahl are the main sources of this list.

defined by zero expenditures for environmental protection. It is apparent that difficulties would arise if this were the case. We would have to imagine the dirtiest industrial process imaginable and measure from that base. This difficulty could be circumvented by measuring only changes in environmental expenditures.

Third, it would be necessary to allocate expenditures that are made in part to protect the environment and in part for other purposes, such as constructing an office building with extra-solid walls partly to shut out noise and partly to enhance the image of the corporate system. Similar problems of allocation arise if changes in industrial processes designed to reduce pollution lead to marketable byproducts.

Fourth, there is a problem of recognition. Suppose that strip mines are put out of business by the introduction of regulations so costly to implement that to do so would make strip mining unprofitable. Deep mines—operated under different management and in different parts of the country—take over. Those answering statistical inquiries for these mines would certainly not recognize that the higher costs which they incur as compared with those of strip mines are environment-protecting expenditures.

My last example relates to the replacement of capital goods. For want of a better name, I call it the forced retirement problem. Its essence is that the cost of environment-protecting investment is likely to be overstated. Suppose that the direct cost of running an old type of machine is 9, depreciation on it is 2, and therefore the total cost of running it is 11. The total cost of running a new type of machine is 10 (direct cost 8, depreciation 2). Both machines have a service life of 10 years. Both machines have the same output. The old type of machine pollutes; the new type does not.

In the ordinary course of events, the old type would be run until it wore out naturally (9 is less than 10) and would be replaced by a new type (10 is less than 11) thereafter. Government, by setting high environmental standards, induces the retirement of the old type one year earlier than its natural retirement. The true additional expenditure incurred to protect the environment is 1 for 1 year (10 minus 9).

What would the respondent report as environment-protecting expenditures? There is some danger that he would report 20 (2 depreciation times 10 years, i.e., the total value of the new type of machine). It would be harder to capture the lower operating cost of the new type of machine (minus 1). And even if we did, we would have 1 over the entire life of the new type of machine, rather than 1 for 1 year, as seems right. To be sure, it would be possible to formulate the questions necessary to elicit the proper response, but it would be difficult to do so and to prevent pitfalls in other circumstances.

In spite of these and probably many other formidable problems into which we would run, I favor an attempt to measure the costs incurred to protect the environment.

Benefits

However, many would say that this is not enough because it does not take into account the damage done by a polluted environment. This is the first objection to the present treatment of environment which was listed. It can be put into a somewhat different context by saying that an analysis of the environmental problem requires the full paraphenalia of cost-benefit analysis. It is not sufficient to measure the cost side of the problem, along the lines I have just outlined. It is necessary also to measure benefits, or dis-benefits. In the simple bread economy example used earlier, we would need to determine the value consumers put on a given deterioration in the quality of the air by equating it with the value they place on a unit of bread. For instance, if an addition of

10 loaves of bread would lead to air pollution that is equivalent to 3 loaves of bread, the true increase in production would be 7, not 10 as presently measured.

I would again urge that we stop and think whether this view is warranted. Do we really believe that GNP should be higher on a sunny day than on a rainy day (or lower, because the lawn is parched and needs water)? Or would a do-it-yourself man who emerges from his basement workshop with a new set of bookshelves consider it kind or rational if his wife then informed him that he had not produced the bookshelves, but the bookshelves less the sawdust and other litter he left behind?

Whatever the outcome of this exercise in homely introspection, which I recommend seriously to any economist before he tackles the measurement of the environment on a national scale, I despair of the possibility of objectively quantifying the benefit side of the equation. The answer which seems to be within reach in the simple bread economy example eludes me when I try to formulate a similar solution for the actual economy.[38]

My despair is based on certain assumptions. I agree with OKUN that national accounting is not a job for philosopher-kings. In spite of its complexities, GNP is and, in my opinion, must remain essentially a down-to-earth concept. In principle, it can be derived from replies to questions which respondents who are knowledgeable about their daily economic transactions are qualified to answer: for instance, replies to questions relating to wages paid or received; profits earned; food, clothing, and shelter bought; plant and equipment installed; merchandise exported and imported; bombers or fighter planes delivered.

Naturally, many difficult definitional problems must be solved to make these questions precise. For instance, in measuring the inventory component of GNP we use a special valuation method. Upon closer examination, however, it appears that as long as inventories increase, this method is like the last-in, first-out accounting method used by business and that it would not be difficult to issue instructions for reporting according to the NIP method which business accountants could readily follow. Even the imputations we make in the GNP, which do involve departures from the marketplace, remain down-to-earth. Instructions could be issued to value wages and salaries in kind at the wholesale cost of the food furnished free; farmers could report farm output produced and consumed on farms at the value of farm output in wholesale markets less the actual expenses they incur to produce this output; and the rental imputation could (and has been) performed by homeowners by reporting the rent that they could obtain by renting their property and deducting the actual expenses they incur in its maintenance. Even the "services rendered free of charge by financial intermediaries," the most forbidding and ethereal of all of our imputations, could be calculated by a knowledgeable bank clerk. Philosopher-kings are not wanted in the construction of GNP.

Taking this view of the nature of GNP, I cannot formulate a question relating to the damages of pollution that could be answered by knowledgeable respondents in a meaningful way. I think that the impasse in formulating and answering such a question is obvious from introspection. Why there should be such an impasse is much harder to formulate. I believe it has to do with the fact that such a question cannot be related closely enough to economic transactions in which we are actually engaged, but I realize that this formulation is more of an assertion than an explanation.

Use of Cost Analysis

Do our difficulties in quantifying the benefit side of cost-benefit analysis—difficulties that, incidentally, seem to affect all cost-benefit analysis and not just the kind we are dealing with here—completely frus-

[38] I believe that this view is compatible with the use of input-output techniques in environmental analysis suggested by CARTER AND LEONTIEF, to which I referred earlier.

trate our attempt to throw light on environmental problems? I do not believe this is the case; quantification of the cost side alone would be a big step forward.

Let me illustrate once more by appealing to personal experience. Suppose a family wants to decide how to apportion its income among recreational, educational, and medical expenditures. Surely a decision based on information relating to the unit costs of these expenditures would permit a much more satisfactory allocation of income than would be possible without such information, even though a precise quantification of the benefits derived from each kind of expenditure is quite impossible.

Deduction of Expenditures

A third manner of dealing with the environmental problem that is sometimes advocated must be mentioned. This is to omit from GNP, as "regrettable necessities," all expenditures designed to protect or maintain the environment. For a criticism of this approach the reader is referred to OKUN, who in turn quotes Denison.[39] Such a procedure would lead to a result in which we would be shown to be equally well off whether we expended large or small amounts to protect the environment. Superficially, at least, this solution might appear to be satisfactory if our needs for expenditures to protect the environment change, pari passu, with the expenditures which we incur. But it would lead to wrong results if we incurred additional expenditures with unchanging needs. It would be analogous to the exclusion of food from GNP on the ground that an increase in food production which merely offsets heartier appetites leaves welfare unchanged.

END OF OUTPUT MEASUREMENT

Many of the remaining recommendations in the table are for the measurement of welfare, broadly defined. They all call for apocalyptic changes in the present definition of output that stem from the imposition of outside value judgments.

Welfare Measurement

I have just reread the Apocalypse. It bears a close parallel to the measurement of welfare: it also introduces an outside value judgment—albeit of an entirely different nature—and pictures changes in the face of the earth that are as cataclysmic as would be the changes in the face of GNP that would result from the application of the criteria of welfare measurement.[40] I stand in utter awe of this strange and singularly powerful document, but I do not believe that it has a message for our humble race of economic accountants. I have inspected the tools we have available to construct a measure of output. They cannot be used to construct a measure of welfare. Nor do I believe that it will ever be possible to forge such tools, essentially because we are asked to depart too widely from the institutional framework of

[39] Denison, "Welfare Measurement and the GNP," pp. 15, 16.

[40] Within this general framework, there are specific similarities: 'Such estimates would subtract from the present national income totals . . . the outlays that have been made necessary in order to overcome difficulties that are, properly speaking, costs implicit in our economic civilization. All the gigantic outlays on our urban civilization, subways, expensive housing, etc., . . . do not really represent net services to the individuals comprising the nation but are, from their viewpoint, an evil necessary in order to be able to make a living. . . . Obviously the removal of such items . . . would make national income totals much better gauges of the volume of services produced, for comparison among years and among nations" (Simon Kuznets in *Studies in Income and Wealth*, ed. Milton Friedman [New York: National Bureau of Economic Research, 1937], vol. 2, p. 37). Compare the Apocalypse: "But leave out of thy reckoning the court which is inside the temple; do not measure that, because it has been made over to the Gentiles . . ." (11:2); ". . . Babylon, great Babylon is fallen; she has become the abode of devils, the stronghold of all unclean spirits, the eyrie of all birds that are unclean and hateful to man. The whole world has drunk the maddening wine of her fornication; the kings of the earth have lived in dalliance with her, and its merchants have grown rich through her reckless pleasures" (18:2–3) (Apocalypse of the Blessed Apostle John, *New Testament*, trans. Ronald Knox).

our market economy. There is no way of assembling a list of factors that contribute to welfare to which there might be general consent, nor of weights by which such factors can be combined. If I understand him correctly, this is a general summary of the argument which Denison presents in the article previously cited. I do not think that we should set out on a venture that would lead to all the frustration associated with imperceptible progress toward an unreachable goal.

This point of view does not imply that I am wholly satisfied with the results that will follow from the observance of the limits that are imposed upon us. Two are particularly vexing.

Limitations of Price Weights

In the first place, I regret that our evaluation of the GNP is based on prices that are the outcome of preferences expressed in the marketplace. For reasons that have been set forth frequently, the unqualified enthronement of consumer preference does not provide a profound basis for judging economic performance. (There is a sense in which ten dollars' worth of classical music is superior to ten dollars' worth of liquor.) The solution is even less attractive if we take into account the fact that these preferences are weighted by the existing distribution of income. However, some comfort can perhaps be derived from the fact that, with some qualifications, relative prices can also be viewed as rates at which various kinds of output can be transformed into one another. These rates of transformation may be insensitive to individual preferences and to the distribution of income.

Government Product and Productivity

Another major qualm is that the decision to adhere to the present principles underlying national output measurement leaves the analysis of government operations in an unsatisfactory state. For the conduct of a full-fledged cost-benefit analysis of governmental performance, we should want to know not only what we know now, the costs of government programs, but should also want to measure the services that government provides. This is the main reason why I sympathize with KUZNETS' recommendation for an approach to the measurement of government output that is radically different from the one we now use. But I cannot see how we can implement it. My only comfort is that information on costs is helpful in itself even if we cannot quantify the benefit side of the analysis. I have suggested this view in discussing the analysis of environmental problems.

In this connection, I must register dissent with ANDO, who appears to believe that in measuring productivity in government the measurement of government services can be sidestepped and who says that "any approximation, however rough, is better than the assumption that the contribution of factors other than labor in government production is exactly zero, and that the productivity of government workers is the same forever." I have already indicated the reasons why I cannot see any advantage to economic analysis from imputing a rate of return to government capital assets. And inasmuch as I regard labor productivity as a ratio of output to labor input, I see no advantage in imputing productivity to government workers by application of some analogy if their final output cannot be defined and measured in its own right. But I am aware that ANDO's view is shared not only by BURNS and LEWIS but also by other competent workers who are not contributors to this volume. I should like to be set right if my views are erroneous.

Significance of Present NIP Accounts

I do not agree with another criticism of the present concept of output measurement,

namely, that it will rapidly become obsolete and lose all significance unless it is converted into a welfare concept. I shall take LEKACHMAN's brilliantly written contribution as a text. He observes that "the tacit premise which all these years has justified concentration upon market activity has been its close relationship with employment." He recognizes that "what is manifestly diminishing among Americans, however, is confidence in growth and high employment as ends sufficient in themselves." "The sooner we take into account . . . the nonpecuniary circumstances that affect subjective prosperity," he says, "the sooner the national income figures will resume their convincing posture as general measures of individual welfare," and he concludes that "if the national income accounts are not amended . . . they can only become increasingly refined computations of activities which interest fewer and fewer people."

Surely this is an overstatement of what, expressed with greater moderation, might be a tenable case. I do not refer to the possibility that the interest in employment and unemployment will fade away less rapidly than LEKACHMAN seems to expect. My point is that there will be great interest in the national accounts even if the employment problem is solved and concern with the environment continues to increase.

Employers and employees will continue to be interested in wages and profits, businessmen will remain interested in changes in the markets in which they sell, concern with our balance of trade will continue, and government will always want to be informed about tax bases and tax yields, to mention only part of the intelligence that is revealed by the disciplined and realistic description of the economic process in the national accounts.

Social Indicators

What I have said thus far also implies some qualms about "social indicators," although I believe that they will turn out to be useful if approached in a spirit of pragmatism. It is generally recognized that it will not be easy to select indicators which truly reflect ends rather than means, whose movements can be related unequivocally to social welfare, and which are adequate in coverage and avoid duplication. Nor will it be easy to find reasonably objective weights to combine the indicators that are selected.

Take an increase in the divorce rate, for instance. Does it indicate a rise in the degree of interpersonal stress and strain? Or does it signal a diminution of such pressures because incompatible couples decide to separate instead of continuing to pollute the interpersonal atmosphere? No doubt pragmatic solutions to this and similar conceptual problems can be found. For instance, the chart on divorce rates can be provided with a double set of legends so that if he prefers the reader can read it upside down.

Socioeconomic Studies

I see fewer problems with the quantitative socioeconomic studies which ELDRIDGE may have in mind. These need not be welfare-oriented and can approach the phenomenon to be investigated from angles that are different. Such studies can be of great interest if they are based upon a clear perception of fundamental historical processes instead of upon the fancies of isolated research subcultures. However, the worth of such studies does not threaten the national accountant with DUNN's entity problem. He need not feel that he must participate because his more traditional investigations are grossly incomplete. He can take these studies or leave them, depending on his interests, abilities, and resources.

INDEX

Page numbers in italics denote references to contributors' papers in "An Economic Accountant's Ledger" by George Jaszi

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