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The Product Side: A Business User's Viewpoint

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Introduction

THE Department of Commerce in July 1947 issued its *National Income Supplement, 1947*, to the *Survey of Current Business*, launching revised sets of income and expenditure data which have been continued without essential modification to the present time. Having crystallized the conceptual framework and determined the form and content of the material, the Department has since turned its major effort toward improving statistical techniques and methods.

The changes and refinements introduced in 1947 marked the culmination of a development of far-reaching significance, not only to students of economics and statistics but also to those who use economic and statistical data in connection with the varied practical problems that arise in modern society. Applying this new mechanism for income and expenditure summation and analysis has added immeasurably to our knowledge of the way the economy functions and of interrelations among the forces which bring about change and progress.¹ A collateral benefit has been the increase of public attention to economic matters. Here was an understandable description of the business structure, the interplay of income and spending, and the distribution of awards to labor and capital. The importance of taxes and the significance of governmental costs were lucidly demonstrated.

Since the series were first introduced, great improvements have been made both conceptually and mechanically, and efforts to make them even more effective continue. Only in the spirit of assisting in such progress should one undertake to appraise the current status of these aggregates.

¹ Users of economic and statistical material are in great debt to the National Bureau of Economic Research for its outstanding contribution to this achievement. For more than thirty-five years the National Bureau has worked intensively in the areas of aggregate income and expenditure. Such pioneers as Mitchell, King, and Kuznets provided the base upon which current series are built. The Bureau cooperated closely with the Department of Commerce in forming the concepts and developing the procedures of the present system. It continues to contribute through its own research and publications, the conferences it sponsors, and the criticism it constantly invites.

THE PRODUCT SIDE

The most important functions of the business economist concern variations in the rate of business activity. He is called upon to trace the changes that time brings about and to set forth the present in juxtaposition with earlier periods. He is required to project future transformations against a background of the past and present. Actual applications of the income-product material are of almost limitless variety and scope. Analysis may deal with the economy as a whole, or with specific and minute sectors; examine changes over long periods or just a brief time span; involve important governmental policies or perhaps only a single business. The principal uses result from two characteristics which these series alone possess.

In the first place, the aggregates are the only direct measures of over-all business activity. Since the amounts are expressed in dollar terms, period-to-period comparisons are necessarily distorted by price fluctuations. Yet the distortion may not matter much over the short run, and in any event can be partially overcome by applying suitable price deflators. Second, the series serve to marshal the various income and expenditure items which make up the total. Thus the different elements can be seen in relation to one another and to the aggregate.

It is not necessary to dwell upon the revolution in methods which the new data have brought about. Formerly no dependable means of determining the position of business at any given time, or of stating changes between periods, was available. The analyst was forced to rely upon such an unsatisfactory measure as bank debits, or to attempt gauging the economy as a whole from series which depicted only fragments of the total (for example, industrial production, carloadings, or power production). Previously a given component could only be considered independently or at best compared with a limited number of others. It is now possible to survey relationships among different factors and to examine the status and role of each in total activity.

The need for accurate and comprehensive data in determining the gross national product has undoubtedly accelerated improvements in statistics of such important elements as retail trade, capital expenditures, and inventories—series whose usefulness, in turn, increases within a gross national product framework.

The business economist applies himself to practical matters concerning labor, capital, consumers, industry, and government. In his professional role he does not become involved in controversies of theory or in the shadings which often preoccupy the student of economics. He is not concerned with statistical niceties, but only with how well the available data meet requirements.

It is from the practical viewpoint that I propose to consider the

A BUSINESS USER'S VIEWPOINT

Department of Commerce expenditure series. The discussion will be directed toward five questions:

- Do the series provide satisfactory measures of aggregate output?
- Are the classifications and breakdowns logical, consistent, and useful?
- Is accuracy sufficient for users' purposes?
- Would faster or more frequent releases make the information more valuable?
- Can changes in terminology or in manner of presentation improve the effectiveness of the data?

The aim is to indicate in a general way how adequately the present information fulfills the needs of the user. Where the series fall short, suggestions toward improvement will be made. In limited space only some of the more important phases can be touched on.

The Series as Measures of Aggregate Output

The summation of expenditures is intended to represent a composite of economic activity at a given time. Like other measurements it must be expressed in precise and unmistakable terms and be based on unvarying standards. Its essential function can best be fulfilled if it is stated as one amount in dollars. The ingredients of the compound should always be the same, so that changes are manifested solely in the quantities and proportions of the constituent elements.

The structural framework is necessarily rigid and unyielding. The handling of each individual component, and the broad classification into which it fits, must be determined. Once made, decisions should be adhered to without deviation until the need for revision has been clearly demonstrated. Then rigidity should give way. The sooner faulty decisions are reversed, the greater will be the ultimate usefulness of the series.

The Department of Commerce has given thorough consideration to the issues involved and determined its procedures only after weighing the merits of various points of view. It conferred with representatives of other nations. Substantial agreement was reached and international conventions were evolved. Yet inevitably the final judgments were more or less arbitrary in some cases and tinged by expediency in others.

The Department has set out three general criteria for the system of expenditures. In substance they are:

THE PRODUCT SIDE

Only economic production is to be measured (i.e. the total commercial output of the country).

Each element included is to be entered at its market price.

Every item of output is to be entered once, but only once.²

These are logical requirements and taken together provide definite specifications within which to build the expenditure aggregate. The design is stipulated completely and clearly, so that the problems of construction can be confined to the more technical aspects. All three standards should therefore, as nearly as possible, be applied without defec- tion.

Conceptual features of income and product have caused never-end- ing controversy. Scarcely a detail has escaped attack or failed to attract staunch adherents. Definite acceptance of these three principles would put an end to most of the argument and counter-argument. No basis for dissent would exist provided treatment of an item in question was consistent with the three propositions.

Had these simple guides been given full emphasis and recognition, controversy would not have been so extended and Commerce would have been in a better position both to defend its treatment in cases where the standards were upheld and to avoid or rectify some devia- tions which have occurred.

Applying the criterion that only commercial output is to be in- cluded disposes of one of the most violent of the controversies—the treatment of noncommercial services. They are automatically elimi- nated, which after all is the only practical solution. No one would deny that the work of housewives contributes incalculably to our well- being or would minimize the importance of the unpaid social worker. It would be desirable to trace the extent of the trend toward do-it-your- self and its repercussions upon the economy. But such matters do not

² *National Income Supplement, 1954* (Survey of Current Business Dept. of Com- merce) contains the following statements:

"In the definition of a measure of national output, the first task is to delimit economic production from the pursuit of other activities that resemble it in that they involve the use of human effort and other resources and are useful. . . . In spite of resemblances, a distinction must be drawn between economic production and non-economic pursuits. For a measure of national output must, broadly speaking, be confined to the former; it cannot, in any systematic way, take account of activities outside the economic sphere."

"The gross national product measures the Nation's output of goods and services in terms of its market value."

"A nonduplicative total is desired, one that is confined to the value of the final, or end, products of the economy and excludes all others, labelled intermediate."

A BUSINESS USER'S VIEWPOINT

lend themselves to exact statistical treatment, and attempts to incorporate them in a national product total must prove futile.

The second standard—that every item should be entered at market price—makes it unnecessary to consider expenditures valued at factor cost. This is indeed fortunate, since the factor cost concept is one of the most unsatisfactory notions with which economists have tried to deal statistically. The difficulty arises from the use of two assumptions, neither of which can be sustained. The first is that the output of the country is entirely attributable to domestic factors. The second is that the factors can be separated one from another and expressed independently of the nonfactor costs, which are taxes and depreciation.

The first assumption is obviously invalid, since the cost of a high proportion of goods includes an additional element—imported materials. For example, foreign rubber, bauxite, and chrome are used in producing American machinery; American meals usually include coffee, tea, or chocolate obtained from abroad; and most of the watches sold here have Swiss movements. Disregarding a constituent as important as this is clearly indefensible.

In the second place, wages, return on investment, depreciation, and taxes are not separate and distinct as economic theory assumes. On the contrary, they are so intertwined that it is virtually impossible to isolate them well enough to produce significant results. Data presently available provide no means of determining how much of the profit of individual businesses and farmers is attributable to entrepreneurial efforts and how much to the capital employed. The compensation of executives in closely held corporations often has little relation to the value of their services; salaries may be included in profits, or vice versa. Depreciation charges are determined by wholly arbitrary methods and are almost never a good measure of the capital consumed.

Taxes, also, are closely tied in with the other elements. Since a part of income taxes—whether personal or corporate—is passed on by the payer, a portion of what appears as earnings and profits is in reality allocable to taxes. It could well be argued that some fraction, if not all, of social security levies should be considered as personal income rather than as tax burden. Again, depreciation deductions are conditioned less by physical and economic considerations than by what is allowed as an income tax deduction. Liberal tax policies tend to increase depreciation and reduce profits and taxes; rigorous tax policies, to raise profits and taxes at the expense of the depreciation charge.

The Department of Commerce has contributed to the factor cost confusion by retaining the term "indirect business taxes" in its tabulations. The wording is unfortunate, as it implies that taxes can be com-

THE PRODUCT SIDE

partmentalized into those which are passed on and those which are not. Certainly there is no essential difference between the excises paid by an automobile manufacturer which are considered to be "indirect" and his "direct" contributions for social insurance. Corporation income taxes are a hybrid, part being shifted and part borne directly.

As long as the market price rule is observed, the only question with respect to taxes is whether to include a given payment among the expenditures. Probably the best practice is to leave out levies which can be readily segregated and not to attempt removing others. Commerce follows this method in the main but does deviate in one or two instances.

Adherence to market price also obviates most arguments about the valuation of goods and services. It becomes unnecessary to speculate about what the prices of monopolistic items would be if competitive conditions were imposed, or to adjust for variations in wage and salary rates, or to question differences in charges for personal services.

The "once but only once" rule settles the treatment of interest paid by government. Commerce is on dubious ground in basing its exclusion of such payments on the role of past wars in government debt.³ This, obviously, applies only to interest on federal securities. Obligations of state and local governments were reduced materially during World War II, so that interest paid by those units must apply to peacetime borrowing. The actual justification for complete exclusion is the fact that the amount government spends for goods and services is not affected by the source of funds—whether the money comes from taxes or new debt. Only the incidence of the cost is altered by different fiscal policies. To increase expenditures by the amount of interest payments would clearly constitute duplication.

The requirement that every item should be entered once but only once also serves to uphold the Commerce practice of including government outlays for business aid in the expenditure total. The benefits of these outlays accrue to industry and farmers without charge and hence are not added to costs for the purpose of determining selling prices. Thus there is no double counting. By way of illustration, if it is true that truckers do not bear their full share of highway costs, neither do their rates reflect this subsidy.

The basic criteria make it clear that Commerce is correct in count-

³ "The exclusion of government interest paid from factor incomes stems, as a practical matter, from the fact that the bulk of government debt was created to finance wars and current expenditures. In no commonsense use of the term can interest payments on such debt be taken to represent currently produced goods and services or the current use of economic resources" (*National Income Supplement, 1954*, p. 35).

A BUSINESS USER'S VIEWPOINT

ing as expenditure such indirect items as the value of services provided by banks and other financial intermediaries without specific charge, and the food and lodging furnished in kind by employers. Unquestionably, commercial output is involved. Pricing is difficult, but an intelligent effort is made to establish market value. Objections to including these indirect outlays arise, in part at least, from their being dubbed "imputations," which tends to associate them with transactions having noncommercial aspects. The line between commercial and noncommercial is sometimes obscure but definitely not in these two cases.

Application of the three criteria does greatly reduce the number of controversial issues. But there are at least four important practices that fail to meet the tests. They are: the handling of rentals on owner-occupied dwellings; the entry of capital expenditures and related charges for depreciation and other capital extinguishments; the booking of transactions with foreign countries; and the pricing of certain governmental outlays.

Five elements comprise rentals on owner-occupied residences as currently totaled: operating expenses (such as maintenance and insurance), interest costs, taxes, depreciation, and a residual termed "rental income." No objection can be raised to the inclusion of actual out-of-pocket operating expenses, and interest payments also seem to be a proper expenditure item. Taxes probably should be eliminated, and, so, clearly, should depreciation and return on investment. The depreciation charge involves double counting, since the cost of the building has already been entered under new construction. The return on owner investment is noncommercial and, like the value of self-services, should be excluded.

The suggestion to exclude real estate taxes calls for a word of explanation. There can be no argument that everything bought or used contains an element of taxes, and the owner-occupied home is no exception. The general principle that tax payments should be omitted when they can be separated easily applies here, as it does with personal property taxes and automobile license fees.

With respect to capital expenditures the Department of Commerce departs from its general practice of accepting business usage in accounting matters. It does not question the amounts charged to expense for repairs and maintenance, research and development, and advertising and promotion. However, it also adds to capital account the cost of such items as tools, dies, durable containers, and drilling oil and gas wells, and increases the provision for capital extinguishments correspondingly in order to retain the balance between income and expenditure. Since business customarily charges these items to expense, they

THE PRODUCT SIDE

are reflected in prices and so are diffused throughout the outlay aggregate. Clearly the Commerce Department's treatment constitutes double counting, and the conventional method is preferable. Because followed consistently, it should not materially distort year-to-year results.

The treatment of capital items charged to expense is but one phase of the capital extinguishment problem. Quite obviously the gross national product also counts private residential construction and plant and equipment expenditures twice—once when the facilities are installed and again as they are used. The Department, recognizing the duplication, has introduced the concept of net national product, which is gross national product minus the capital consumption allowance. *National Income Supplement, 1954*, (page 31) states:

“These two aggregates are in a theoretical sense more clearly defined than the corresponding measures of gross national output, since some duplication is involved by the inclusion in the latter of the production of fixed capital which serves merely for replacement purposes. However, as a practical matter, a fully satisfactory measure of net capital formation, and hence of net national product, cannot be calculated since depreciation charges are not available on a basis of valuation comparable to that of the gross production of fixed capital.”

A nearly identical statement appeared in the *National Income Supplement, 1951* (page 23). Apparently little progress was made in resolving the depreciation question during the three years following, and little is contemplated. From a paper presented by Edward F. Denison at a National Bureau of Economic Research conference in 1953,⁴ it appears that the problem is regarded as insoluble for three reasons: first, there is no means of estimating the actual remaining life of existing capital assets; second, a defensible method of apportioning the extinguishment over the period of remaining life could not be developed; third, improvement in the quality of capital goods prevents a tenable treatment of price changes.⁵

The complacency with which the Commerce Department dismisses the matter is surprising, since the present treatment gives rise to significant distortions. A simple example will illustrate.

Assume that the gross national product in period A is at a rate of

⁴“Theoretical Aspects of Quality Change, Capital Consumption, and Net Capital Formation,” in *Problems of Capital Formation: Concepts, Measurement, and Controlling Factors*, Studies in Income and Wealth, Volume Nineteen, Princeton University Press for National Bureau of Economic Research, 1957.

⁵ This view is undoubtedly too pessimistic. The depreciation problem is being attacked with vigor and some success (see particularly George Terborgh's *Realistic Depreciation Policy*, Machinery and Allied Products Institute, 1954).

A BUSINESS USER'S VIEWPOINT

\$360 billion, of which \$50 billion represents new construction and producers' durable equipment. The capital consumption allowance totals \$30 billion. In period B the gross national product has risen to \$370 billion. Capital items again total \$50 billion, but the charge for extinguishments has risen to \$40 billion. If the gross figures are used, the rise from period A to period B is \$10 billion, or nearly 3 per cent. But on a net basis (that is, after deducting the charge for capital consumption) the total is \$330 billion in both cases. The apparent gain was illusory, and attributable merely to an increase in the amount of depreciation included in the value of goods and services consumed.

Eliminating depreciation on owner-occupied dwellings and leaving out capital items charged to expense would diminish the capital consumption allowance considerably. Further reductions on similar reasoning, could be made by omitting institutional depreciation and charges for accidental damage to fixed capital. The remainder would consist merely of depreciation and obsolescence on fixed assets held for rental or used for business purposes by corporations and by farm and other unincorporated enterprises.

Modifications to reduce the size of the distortion would mitigate, but not solve, the fundamental problem of duplication. Solution is apparently prevented by the belief that it requires determining real capital consumption in current dollars. This cannot be done; ergo, the problem cannot be solved.

Fortunately, the syllogism breaks down whether or not a true figure for depreciation can be established. When the aim is solely to derive output totals, ascertaining the actual exhaustion of capital is entirely irrelevant. That effort becomes pertinent only when the inquiry is extended to such fields as consumption and wealth.

Under the "once but only once" rule the amount to be eliminated for output purposes is not the capital actually consumed, but instead the depreciation which producers include in costs. It would be quite incorrect to take out any other amount than that which has been put in for pricing purposes. Just as the market price criterion sidesteps questions of consistency in prices generally, so it avoids the difficulties of correctly establishing capital use. The only germane figure is the total contained in the selling prices of goods and services.

Ascertaining the depreciation so taken should not prove too arduous. A questionnaire on how the cost of products is determined could be directed to business concerns. For most corporations, probably the depreciation used in costs conforms very closely to the amount reported to stockholders and on income tax returns. For unincorporated enterprises and property owners, and particularly for farmers, some more or

THE PRODUCT SIDE

less arbitrary estimates would be required—perhaps not more arbitrary, however, than the currently made income estimates for these same groups.

The present treatment of foreign transactions goes to the opposite extreme from that of capital outlays. Receipts from foreigners are offset against expenditures for imported goods and services so that only the net amount is reported, while expenditures for capital goods are entered gross with no allowance for exhaustion of existing resources.⁶

To illustrate the inconsistency of the difference in method consider three newly manufactured automobiles, identical except for serial numbers. The first is sold to an individual, the second to a business concern, and the third for export. The transactions are entered in the gross national product in this manner:

<i>Sold for</i>	<i>Entry</i>
Personal use	Price entered in personal consumption expenditures
Business use	Price entered initially as producers' durable equipment, and then added again to various categories as depreciation recovered in the price of products sold
Export	Price netted against the cost of coffee, Scotch whisky, and other imports

Certainly each car represents the same contribution to output. The handling of the unit sold for personal use is correct, and the other entries should conform. For the car sold to business, the depreciation charged against operations on its account should be deducted in computing the expenditure aggregate, as already suggested, to eliminate double counting and leave only the initial outlay. The export car should be counted fully, not netted against imports. Output is still output, regardless of where it goes.

The current method of booking foreign trade is wrong in theory and could produce serious distortions. Consider two periods; in both the gross national product is \$360 billion and net foreign investment is zero. In the first instance, however, receipts from abroad are \$15 million and in the second \$25 billion. An observer who did not look behind the figures would conclude that activity was the same in the two periods. This was far from the case. The amount of foreign trade unquestionably has an important bearing upon the state of business.

⁶ Jacques J. Polak points out the deceptive results of netting foreign transactions; especially that the importance of foreign trade is seriously understated (see "Conceptual Problems Involved in Projections of the International Sector of Gross National Product," in *Long-Range Economic Projection*, Studies in Income and Wealth, Volume Sixteen, Princeton University Press for NBER, 1954).

A BUSINESS USER'S VIEWPOINT

When exports and imports are large an economy is much different than when foreign trade is unimportant.

Besides distorting the record, offsetting foreign transactions tends to cause the analyst to neglect them. Unless the net total is unusually large, it may be given scant consideration. Some nations do report the gross figures, and Canada draws attention to foreign trade by setting forth in its gross national product tabulations the receipts and expenditures which produce the figure of net foreign investment.

The fourth important area of difficulty is governmental prices. The federal government, and many state and local units, sell goods and services to business and consumers. The long and diverse list includes such important items as mail service, farm commodities, water, electricity, gas, liquor, and toll roads. Their pricing is determined by governmental edict and is not necessarily related to the costs involved or to actual worth. Governmental purchases, too, are often priced by non-commercial methods. For example, defense contracts are renegotiated according to executive directives; strategic materials are often bought on terms that differ from going market values; payment for farm commodities is based upon arbitrary support formulas; and salary scales for public employees may be influenced by political considerations.

Pricing in the government sector undeniably has its peculiarities. It is equally certain that no techniques could be devised which would satisfactorily remove these quirks. The obvious answer, then, is to let well enough alone, as with privately determined prices, many of which have also their idiosyncracies. One entry, however, is clearly unrealistic and requires adjustment—the rate of compensation for military service. The practice is to record just the pay and allowances of men in the armed forces plus the value of their food and clothing. No provision is made in the gross national product for terminal leave, bonuses, and various other veterans' benefits, all of which are treated merely as transfer payments when disbursed. The Department of Commerce explains: "Counting these payments as compensation for services would have necessitated allocating them over past years on an accrual basis—a course which seemed artificial and would have involved continuous revisions of the national income and product estimates for the war period."⁷ Clearly only very rough estimates of the amount of deferred compensation are possible. But just as clearly, even a rough estimate is better than none at all. Otherwise, output is sure to be understated in any period when the country maintains a large defense establishment.

⁷ *National Income Supplement, 1954*, p. 54.

Classifications and Breakdowns

Use of a single dollar amount to measure aggregate output can scarcely be questioned. It facilitates statistical presentation. It obviates the confusion inevitable when more than one concept is employed. It clarifies issues of structural framework and methodology.

Different considerations apply to breakdowns of the total. Here it is of advantage to have numerous analyses designed to set forth different aspects of the economy. The practitioner's only requirements are that the analyses be logical and useful, and that their respective addends produce identical sums.

Among possible systems of classification, for example, are those suggested by the following four questions:

What agents are responsible for the output?

What activities account for the production?

What is produced and consumed?

What groups make use of the output?

The primary national income tabulations are prepared in accordance with the first system. The contributions of labor, capital, and other elements are measured and a total is derived which theoretically is the same as the amount produced by aggregating expenditures. Actually there is always a discrepancy, which for convenience is thrown against income rather than against outlay. (In Canada it is applied half to income and half to expenditure, showing that the location of the errors is unknown.)

The income accounts are then broken down under such subheadings as manufacturing, trade, government, and agriculture. Such an array could serve to answer the second question—what activities account for the production? However, Commerce has chosen to stop the compilation at factor cost rather than bringing the total to equality with the expenditure aggregate, as in the principal income tabulation.

A nucleus for classification by types of goods produced and consumed is provided by the census of manufactures, in which value added by major industry groups is entered and totaled. Difficulties are encountered, however, in tracing the flows beyond the manufacturing stage. Unless this obstacle can be overcome, only a mixed result is possible, built partly by kind of production, partly by production agency.

The principal expenditure tabulation employs a separation scheme of the fourth type—the groups making use of the output. Over the

A BUSINESS USER'S VIEWPOINT

years it has become apparent that an analysis by consuming entity has more utility than any other single breakdown would afford. It points out clearly that final output is being measured free of the duplication of interindustry sales and transfers. It shows goods and services flowing to the ultimate user as distinct from additions being made to the stock of capital. It provides a good starting point for studies of economic motivation and behavior. It is simple and direct, calling for but four primary groups, all important and all fairly homogeneous.

The subclassification of expenditures is mainly by type of output rather than of use, but not throughout. Personal consumption expenditures are distributed among durable goods, nondurable goods, and services (not by user characteristics such as sex, age, or income). Outlays on capital account are divided among construction, producers' durable equipment, and additions to inventories (not among manufacturers, wholesalers, retailers, and other producers). But in the case of government the subclassifications, federal, and state and local, are by type of user, as in the primary scheme.

Aside from that inconsistency, numerous imperfections of definition are found. For example, among personal expenditures the division between durable and nondurable goods is far from absolute. A car is durable and an overcoat is nondurable, although many men replace their automobiles more frequently than they buy new overcoats. A nondurable linen tablecloth may outwear a durable dining room chair. The definition of services also produces some strange inconsistencies. A household which uses gas or electricity for heating employs a service, but one which is heated by oil or coal is buying nondurable goods. Again, certain services are payments for labor only; whereas the labor element is negligible in other service items. In the section termed gross private domestic investment, the distinction between residential construction and consumers' durable goods is at times tenuous. The mechanism which heats a house is ordinarily included in the cost of construction, but a cooling unit is usually excluded. Kitchen equipment and other major appliances are classified as consumer durables even though they are often bought and mortgaged as a part of the house. The cost of farm dwellings is not classed with residential construction but in other building. Finally, the producers' durable equipment category has been stretched to include expensed items, some of which have but a short life.

The present primary expenditure classification is undoubtedly the best that could be devised; and in the main, the subgroupings are justifiable from a practical standpoint. The current presentation of gross national product needs change in only two respects: first, to effect some

THE PRODUCT SIDE

modifications in basic concepts, as recommended in the preceding section; and second, to maintain the functional basis of subclassifications throughout. A proposal for a new statement of expenditures is set forth below.

<i>Personal Expenditures</i>	
Construction	XX
Durable goods	XX
Nondurable goods	XX
Services, personal	XX
Services, nonpersonal	XX
	XXX
Subtotal	XXX
<i>Net Additions to Private Capital Assets</i>	
Construction	XX
Producers' durable equipment	XX
	XXX
<i>Less—Capital consumption allowance</i>	XX
	XXX
Change in business inventories	XX
	XXX
Subtotal	XXX
<i>Exports of Goods and Services</i>	
Merchandise	XX
Services	XX
	XXX
<i>Less—Grants and aid</i>	XX
	XXX
Subtotal	XXX
<i>Government Purchases of Goods and Services</i>	
National security: construction and durable goods	XX
National security: operating and maintenance	XX
Other than national security: improvements	XX
Other than national security: operating and maintenance	XX
	XXX
Subtotal	XXX
Total	XXX

Personal expenditures as restated contain a portion of the construction outlays now included in gross private domestic investment. This is the construction related to owner-occupied dwellings, both farm and nonfarm, and to nonprofit institutions. The definition of construction is broadened to cover net transfers of existing dwellings from rental to owner use, the appropriate deduction being made from construction remaining in private capital formation. The division of residential

A BUSINESS USER'S VIEWPOINT

construction in this fashion follows from the suggestion to eliminate imputed rents on owner-occupied dwellings. Housing costs of owners become the sum of the cost of new acquisitions and of expenses for operating and maintaining structures already owned.

No specific suggestions are made for improving the division between durable and nondurable consumer goods, although the matter warrants attention. However, it is suggested that services be divided between personal services, those in which labor cost predominates, and others, representing mainly capital use. Determining the types to be put in each group would require careful analysis. Obviously professional fees would fall within the personal service category, and most rentals and utility charges in the other.

Outlays for construction and producers' durable equipment are diminished by omitting expensed items, as well as by taking out institutional building and expenditures on owner-occupied homes. What remains is the amount spent by producers for fixed assets. The consumption allowance is applied against this outlay, leaving a net figure which will probably approximate the change in aggregate carrying value as shown by the books of businesses and landlords.

The deduction on account of capital consumption is, as recommended earlier, the amount actually included in costs and selling prices. For the purposes at hand it is not necessary to determine whether or not the charge correctly measures the exhaustion of fixed assets during the period. Actually, there is ample reason to conclude that it will not do so.

Although depreciation enters into the pricing of nearly every element in the expenditure aggregate, it obviously cannot be removed item by item. Its pervasiveness could be indicated by making a blanket deduction just before the grand expenditure total. The method suggested seems preferable for two reasons. It conforms to accepted practice in financial accounting, and it conveniently shows the proportion of capital expenditures that is covered by charges for extinguishments.

The increase in business inventories is added to the net change in fixed assets. The subtotal is captioned "net additions to private capital assets." This designation is reasonably accurate and much more informative than the present "gross private domestic investment."

One of the most significant departures from present practice is that of substituting the category "exports of goods and services" for the present "net foreign investment." The basis for the change, already discussed, is that a measure of output should include everything that is produced within the country, irrespective of destination or nature of the user. (The grossing of foreign trade would of course require adding

THE PRODUCT SIDE

imports to the income side of the output calculations in order to maintain the balance.) The subclassifications advanced for exports are highly tentative, although they conform to the present handling in periodic reports of the balance of payments.

Two changes are suggested for government purchases, one in concept, the other in classification. Current usage in pricing services rendered by the military, as was noted, includes only the amounts actually disbursed to servicemen and the computed value of subsistence. For a full statement of their compensation, benefits which will be paid after the period of active duty should be added. Experience in the decade since World War II provides a reasonably good basis for estimating the amount which should be accrued in the case of men serving in the forces today. Even an imperfect estimate will come closer to reflecting the true cost than a figure which ignores the matter.

A functional division of governmental expenditures, consistent with the analysis of other expenditures, is suggested in place of the present breakdown by type of consumer (the federal government, and state and local units). Departures from the general scheme could be justifiable as yielding more valuable information; but that does not seem to be the case here. The primary income-product series do not afford a complete separation of federal receipts and expenditures from the corresponding amounts for state and local units. In the absence of comprehensive figures, the available information could better be given in a subsidiary schedule providing a full analysis.

The present division between national security outlays and nondefense spending is retained. Both groups are subdivided between construction and durable goods on the one hand, and operating and maintenance expenses on the other. The suggestions are, however, provisional, since it might be found that other functional breakdowns would be easier to obtain or of more practical use.

Accuracy and Usability

The measurement of economic phenomena is a complicated process. Difficult questions of concept and structure are encountered. The statistics available are often incomplete or unreliable. It is not surprising that precise results are rarely achieved.

The income-product series undoubtedly represent the most ambitious venture into economic valuation that has yet been undertaken. To expect statistical exactness, particularly in early releases, would be quite unrealistic. Nevertheless, for practical value the data must be accurate enough to accomplish two purposes—to depict changes in the economy as they occur and to relate levels of activity at different

A BUSINESS USER'S VIEWPOINT

times. In other words, the quarterly reports should at least give a good indication of the direction and extent of current movements in business, and the annual figures should portray the performance of commerce and industry in its true light when compared with other years.

The national income issues of the *Survey of Current Business* set forth a mass of information which includes revisions of previously reported figures. The revisions fall into three main groups, deriving from conceptual changes, from later or more reliable benchmarks, and from better statistics or advanced methods of processing. No significant alterations in concept have been introduced since 1947. Important basic information has been provided by censuses of manufactures, business, population, housing, and agriculture. Other new benchmarks become available each year, the most far-reaching being the tabulations of the Internal Revenue Service, which lag about three years. Statistical corrections arising in other ways have been irregular and greatly varying in importance.

Despite revisions, few if any items can be stamped "final" or "correct." However, there must be a presumption that as time passes and additional data are received, a more accurate presentation is possible. It was thought that an inquiry based on this presumption might be useful in gauging the reliability of the expenditure series.

The following method of judging seasonally adjusted quarterly figures was adopted. First, beginning with the release for the second quarter of 1947 and extending through the first quarter of 1955, each original tabulation was entered and corresponding figures as given in subsequent revisions were set down.⁸ Next, quarter-to-quarter changes were determined for every entry, original and revised. Then differences were taken between changes derived from the latest tabulation and the corresponding amounts for each earlier release. Finally, the differences were expressed as percentages of total gross national product.

If it is correct to assume, as the study does, that the figures presented most recently represent the true changes which have taken place from quarter to quarter, two objectives are accomplished. The size of errors contained in original releases is established and the amount of improvement achieved by subsequent revisions is traced.

At the time of writing, the most recent revisions are those in the July 1955 issue of the *Survey of Current Business*, for 1952 through the first quarter of 1955. The latest revisions for earlier years are contained in the *National Income Supplement, 1954*.

The study covers thirty-two quarters, or thirty-one quarterly

⁸ The starting point chosen is the first original release after the major revisions incorporated in *National Income Supplement, 1947*.

THE PRODUCT SIDE

changes. For the most recent quarter the gross national product figure has been revised once. The number of revisions rises to two, three, and four for earlier periods, as the tabulation of quarterly changes shows:

<i>Quarters Included</i>	<i>Revised at Least Once</i>	<i>Revised Two or More Times</i>	<i>Revised Three or More Times</i>	<i>Revised Four Times</i>
2nd 1947—4th 1947	2	2	2	2
4th 1947—4th 1948	4	4	4	4
4th 1948—4th 1949	4	4	4	4
4th 1949—4th 1950	4	4	4	4
4th 1950—4th 1951	4	4	4	1
4th 1951—4th 1952	4	4	4	1
4th 1952—4th 1953	4	4	1	—
4th 1953—4th 1954	4	1	—	—
4th 1954—1st 1955	1	—	—	—
Total	31	27	23	16

During the period as a whole, the median quarterly change in the gross national product was slightly less than 2 per cent. Hence, it seemed reasonable to assume that any revision showing up as more than 1 per cent was of definite consequence.

A second tabulation summarizes the essential results of the study. Showing the significant errors in the principal components and in the totals.

	<i>Original Presentation</i>	<i>First Revision</i>	<i>Second Revision</i>	<i>Third Revision</i>
Number of quarterly changes included	31	27	23	16
	Number of instances in which the error amounted to over 2% of gross national product			
Personal consumption expenditures	—	—	—	—
Construction and producers' durable equipment	—	—	—	—
Changes in business inventories	2	—	—	—
Net foreign investment	—	—	—	—
Government purchases of goods and services	—	—	—	—
Total gross national product	2	3	2	—
	Number of instances in which the error amounted to less than 2% but more than 1% of gross national product			
Personal consumption expenditures	4	1	—	—
Construction and producers' durable equipment	—	—	—	—
Changes in business inventories	6	3	1	3
Net foreign investment	2	1	—	—
Government purchases of goods and services	3	—	—	—
Total gross national product	11	5	6	4

A BUSINESS USER'S VIEWPOINT

The results are set forth on the basis of magnitude only, without taking account of the course of movement. There were in fact numerous cases in which the actual direction was misstated. Errors of this kind were most pronounced in original tabulations but persisted, to a diminishing extent, in the revisions. The study yields three generalizations:

1. Important adjustments have proved necessary in nearly all of the principal components, and in total gross national product as well. Changes in the measurement of shifts in business inventories have been the most marked. The tendency of errors in the components to offset each other has not eliminated the need for significant corrections to the aggregate.

2. Errors were largest in initial publications, but early revisions also contained important inaccuracies. Apparently, close results can be achieved only when solid benchmarks are available. Thus about a three-year wait is necessary before the degree of exactness of the original figures can be determined.

3. Inaccuracies have characteristically been serious when the volume of business was changing rapidly. They were large in the first quarter of 1949, in the second and third quarters of 1950, and in the first quarter of 1954.

The conclusion is that the expenditure series have not been very satisfactory measures of short-term change. Important errors have arisen, particularly when close determination was most needed.⁹

More adequate underlying statistics and improved methods of processing them should make the current quarterly figures better than those of a few years ago; but in the absence of third and fourth revisions for the latest years, it is difficult to measure the progress being made.

The annual series were examined similarly. Not only were the inaccuracies much smaller percentagewise, but in absolute amount the errors were often less than those for the quarterly figures. Part of the explanation is that the difficulties of seasonal adjustment are not encountered. Also, since errors seem to be predominantly of random rather than systematic character, they tend to compensate for each other over longer periods.

⁹ William H. Shaw concludes that the income and product series have limited value for following short-term economic changes, in part because of inaccuracies in the various components ("How Good Are Current Statistics For Following Economic Changes?" presented at the Annual Meeting of the American Statistical Association, Montreal, September 1954).

THE PRODUCT SIDE

The expenditure series are unquestionably more valuable as indicators of annual than of quarterly movements. In addition to their statistical superiority, yearly reports have the advantage of adjustability for price changes. For periods that are not too extended, the available price deflators can produce fairly acceptable results.

When intervals of more than one year are involved, the accuracy of comparisons in money terms improves even further (except when the period encompassed reaches into early years for which comprehensive basic data are lacking). However, as the significance of dollar errors becomes less, other problems mount, and far outweigh that gain.

In the first place, the distortions resulting from conceptual shortcomings become increasingly serious. Because of the decided trend toward home ownership, the imputation of rents to owner-occupied dwellings alters the significance of the rental total. The duplication produced by ignoring depreciation cumulates with the growth of the stock of capital assets. The size and characteristics of foreign trade change, so that the netting of imports and exports may impair the validity of comparisons. With pronounced shifts in the size of the military establishment, the importance of the understatement of service pay fluctuates greatly.

Secondly, the problems of adjusting for price changes intensify and become almost insuperable as differences in nature and quality of products increase through time. This will impair the series as measures of long-run trends in physical activity, however much they may be improved conceptually.

Frequency of Releases

The income-product material for a calendar quarter first appears in a special release about the middle of the next quarter. The tabulation is repeated shortly thereafter in the *Survey of Current Business*.

Data for use in the release become available under differing schedules. Information for some segments is compiled soon after the end of the quarter. In other cases only preliminary estimates are at hand. No attempt is made to include in the initial releases even a tentative figure for one important sector, corporate profits. Preparation of the series begins as soon as data on personal income and inventories have been processed and retail sales have been totaled. This is usually about a month after the quarter ends. Approximately ten working days are consumed in assembling and checking the figures for publication.

An appreciable speed-up of current releases does not appear feasible. The basic data cannot be assembled much faster than at present, and only a short time elapses between receipt of the processed material and

A BUSINESS USER'S VIEWPOINT

issuance of the series. Possibly the ultimate goal should be to advance the publication date about two weeks. A thirty-day interval before the release would seem to be the very shortest practicable without undue sacrifice in accuracy.

A quarterly report is centered at the middle of its period. Thus a release one month after the quarter would have a reporting lag equivalent to about two and a half months. With the next release three months later, information would become as much as five and a half months old before being freshened.

Three possibilities might be considered as ways of reducing the time factor: advance quarterly estimates, monthly releases, and quarterly computations issued each month.

The Council of Economic Advisers has at times released advance estimates of forthcoming quarterly figures.¹⁰ Being based upon incomplete data covering at most two months of the quarter, these estimates have on occasion differed substantially from the actual statements. Regular dissemination of advance estimates would seem to be a questionable policy, since the widest deviations are most likely to occur at critical periods and in critical areas.

Nearly all of the data now being used for quarterly reports are gathered monthly or could be closely approximated on a monthly basis. (The principal exception, of course, is corporate profits, which are not even available in time for quarterly releases). Consequently most of the basic information needed for a monthly release is already at hand, seasonally adjusted. The additional effort entailed by monthly series would not be great.

Preparing a monthly release should not take more time than its quarterly counterpart. Thus the aim might be to issue the figures after thirty days. In that case, the reporting lag would be one and a half months from the centering date, and the maximum period before freshening, two and a half months, as against a span of two and a half to five and a half months for quarterly reports.

Monthly tabulations would be particularly susceptible to random fluctuations and would magnify statistical errors and distortions. The third possibility mentioned—a quarterly statement prepared each month—would diminish the seriousness of these to about the same extent as the releases for calendar quarters do. It would not shorten the reporting lag, but the maximum period before freshening would be reduced from five and a half to three and a half months.

Since technically it seems possible to prepare the series on a monthly or quarterly-moving basis, the only question is whether the value gained

¹⁰ See, for example, *Economic Report of the President*, January 20, 1955, p. 137.

THE PRODUCT SIDE

would justify the effort and expense required. Judgment turns on two considerations: accuracy, and the suitability of the information for measuring short-term change.

It has already been concluded that inaccuracies limit the usefulness of present series. Quarterly-moving reports would be subject to the same, and monthly releases to larger, error. Until greater exactness has been achieved, there is little ground for urging more frequent reporting.

Certain other characteristics of the series detract from their usefulness for short-run measurement. In the first place, the quarterly figures are presented only in current dollars. Changes in price level from one quarter to the next are not usually very great, yet they often account for an important part of the rise or fall in the expenditure aggregate. Furthermore, since prices tend to go up and down with business activity, dollar measurements usually amplify the extent of physical variation. It will not be possible to make very effective use of quarterly figures until deflators have been constructed. Secondly, the series are not sufficiently volatile to help much in early appraisal of shifts in business activity. Such movements have been sizable in the postwar period; nevertheless, the quarterly change in gross national product was only 6.7 per cent at its highest, and in only six instances did it exceed 4 per cent. During the same period the quarterly change in the Federal Reserve Board's index of industrial production went as high as 9 per cent, and was over 4 per cent in nine cases.

The conclusion is that more frequent gross national product reporting, although practicable, would not be worth the cost. A preferable course would be redoubling efforts to improve the accuracy of present releases, and at the same time expanding their worth by simultaneous issue of quarterly price deflators.

Terminology and Presentation

Professional users of economic statistics, knowing the nature and sources of the income-product series, can make use of the data without giving much attention to the labels that have been applied to them. Nevertheless, terminology is important. The practitioner often presents his findings or the results of his researches to nonprofessionals. Presentation is made easier and more effective if titles are accurate and employ words in general use.

The phrase "gross national product" is not confined to the vocabularies of economists and statisticians. The measure has grown to be recognized as the heart of economic analysis by nearly everyone who follows business developments. Thus the language in which it is expressed

A BUSINESS USER'S VIEWPOINT

is of wide consequence. Understandably, attention was concentrated on concepts and substance when the measure was being developed. Nevertheless, it is unfortunate that an accurate, easily comprehensible description was not devised. The term "gross national product" is uninformative and actually misleading.

In the first place, the product as now constituted is "gross" in only one respect. The sole characteristic which prevents it from being "net" is that no allowance has been made for exhaustion, obsolescence, or loss of facilities used in the process of production. Under the recommendation advanced in this paper, that exception would disappear. In any case, there is little excuse for keeping a word which in other particulars contradicts the aim of the measure. Intra-business sales are carefully eliminated in the series, to achieve a total containing only these elements: output actually sold to ultimate consumers, additions to the stocks of capital goods, and accumulations in business inventories. In fact one component is even less than net. Exports of goods and services are counted merely to the extent that the amounts paid by foreigners exceed expenditures abroad. If imports prove to be greater than exports, the total product is actually reduced.

Secondly, "product" is a poor choice when "output" is available. "Product" has a connotation of physical goods, whereas the measure includes services as well. The term may suggest to some only the actual production of goods and not their movement and distribution. Further, "product" is not descriptive of the total when built up from a tabulation of income and profits; "charges against gross national product" is an unrevealing term.

To emphasize once more, the goal should be a single total measuring as accurately as possible the true economic output of the country. If this aim is accomplished there is no need to retain the alternative terms "gross national product" and "net national product." Both can be replaced by "national output."

The tabulation showing what happens to total output could be labeled simply "distribution of national output." The phrase could be amplified as new classifications were formulated:

Distribution of national output by type of consumer

Distribution of national output by type of product

Distribution of national output by type of producer

The tabulation derived from income and profits could be described simply as "shares in national output."

If the suggestions offered earlier in this paper were adopted, "shares

THE PRODUCT SIDE

in national output" would of course differ materially from the present "charges against gross national product." Personal income would be changed in two principal ways: by a fuller report of the earnings of servicemen; and by abandoning the imputation of rents to owner-occupied dwellings. Imports of goods and services would be added. The capital consumption allowance would be shown only to the extent that the provision for extinguishments used in determining profits differed from that included in the price of the product.

The current fashion is to express income-product relationships through debits and credits. An outsider is in no position to appraise the practical value of that accounting fiction in the assembly and codification of the data. Its possible value in facilitating standardized international processing and reporting is also important, and hard to judge.

There is a superficial objection to the use of an accounting analogy in economic and statistical discussions—it leads to endless repetition of the phrase "social accounts," a term that is becoming as worn today as "propensities" and "supply and demand" in earlier days. More fundamentally, most economists, not being accountants, are poor expositors when they turn to the terminology of the accounting profession. They are at home in discussing identities, relationships, and flows, but in foreign territory with income statements, balance sheets, and costing. As a consequence, simple relationships, if not actually misrepresented, may at least be made to appear complex.

Despite this tendency toward seeming complexity, academicians testify that the framework of accounts does help them explain the income-product material and accordingly the inner workings of the economy. However, serviceability in teaching is but one consideration. It needs to be shown also that advances in fundamental knowledge are being provided by insights gained through the accounting method.

Most professional investigations of income and product come under three broad aims: to improve the series conceptually or statistically; to broaden their scope through different or more detailed analyses; and to relate them to other kinds of statistical information and economic concepts. All of this subject matter is of interest to those who deal with measurement and interpretation of economic events. Does the accounting nomenclature actually further progress in these three directions? It is not clear that such has been the case.

The Department of Commerce places great store on accounting techniques in the public presentation of income-product material as well as in the preparation of data. So far as the user is concerned the advantages claimed seem to boil down to two points. The first is that the accounts help in understanding the structure and functioning of

A BUSINESS USER'S VIEWPOINT

the economy; the second, that for some obscure reason, the economic accounting system makes it "easier to live with" unresolved problems.¹¹

The annual national income issue of the *Survey of Current Business* contains a section with six income and product accounts. Each has its complement of debits and credits, and includes balancing items so that the left and right side totals agree. The material is taken entirely from nearby tables in the ordinary forms; the accounts merely summarize or rearrange the information. The value of tables in the form of accounts is severely limited since they can show just a single period, whereas the other tables give a running comparison annually or quarterly. Since measurement of change is the most important use to which the series are put, this lack of continuity is an extremely serious objection.¹²

It is apparent that the accounts can serve no important purpose other than to emphasize or to clarify relationships in the basic material. That they fulfill this aim seems very doubtful. On the contrary, the accounting expression might confuse even an expert accountant. Debits and credits are transposed so that their meaning is obscured. Captions include such overwhelming phrases as "income originating in and net and gross product of households and institutions" and "net disinvestment in the United States."¹³

The fact is that employing accounting terms has positively bad effects. In the first place, the uninformed may be led to believe that the income-product material is built in the same way as the accounting records of business concerns, with results comparable to statements presented by accountants. This, of course, is not the case. Commercial transactions are always reflected in simultaneous and equal debits and credits, whereas most of the data for the income and product totals are prepared and entered independently. Here is a fundamental difference: business accounting invariably is numerically exact; income-product tabulations inevitably are numerically inexact. Accountants would not tolerate a reconciliation obtained by forcing a balance. Income and product are two distinct series, and a statistical miracle would be required to bring them to equality. No matter how much the basic information is improved, a discrepancy will remain.

¹¹ *National Income Supplement, 1954*, p. 28.

¹² Accounts could, of course, be set up for each period under review, but they would not permit ready comparison, and the space required would be prohibitive. *National Income Supplement, 1954*, covers twenty-five years (1929-1953) and sixty quarterly periods (1939-1953).

¹³ Simon Kuznets vigorously denies the merits which Commerce attributes to the system of accounts but then points out two other advantages which seem to have little more substance ("Discussion of the New Department of Commerce Income Series," *Review of Economics and Statistics*, August 1948).

THE PRODUCT SIDE

A second objection has already been indicated—the awkwardness of expression that results from transplanting the accountant's apparatus. Take, for example, Table 1—National Income and Product Account.¹⁴ The first item on the credit side is "personal consumption expenditures." Accountants would argue that expenditures are debits, not credits, whereupon it would be necessary to explain that what is really meant is "output going to consumers," a title rejected in order to show the entry as identical to personal consumption expenditures reported elsewhere. The table also puts profits on the left side with taxes and capital consumption allowances. Accountants would contend that profits are credits whereas taxes and depreciation are debits. Here the explanation would be even more unsatisfactory and involved.

The American Institute of Accountants each year surveys the accounting aspects of the annual reports of the principal corporations of the country.¹⁵ The studies show an unmistakable trend toward everyday language in the accounting statements prepared for general use. The term "profit and loss" is being supplanted by "income" or simply "earnings." "Balance sheet" is giving way to "financial position" or "financial condition." "Surplus" is yielding to more understandable terms. Debits, credits, and the word "account" are rarely mentioned.

Over the years economists have coined a vast number of technical expressions. So far as possible these should be confined to academic treatises and professional discussions. In presentation to the public we should follow the lead of the accountants and simplify terminology. At the very least, needless borrowings from this other profession should be discontinued.

C O M M E N T

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On the Hagen and Budd Paper

As is apparent from my paper, I am in broad agreement with Everett E. Hagen and Edward C. Budd on many of the issues they discuss. My only basic dissent from their views concerns the measurement of the government contribution to national output, and in what follows I shall deal mainly with this matter. I shall, however, preface my remarks with a comment on their definition of economic activity, partly

¹⁴ *National Income Supplement, 1954*, p. 160.

¹⁵ See *Accounting Trends & Techniques*, 8th Annual Survey, American Institute of Accounts, 1954.

COMMENT

because this will help to introduce some considerations relevant to the subsequent argument.

ECONOMIC AND NONECONOMIC ACTIVITY

In the section of my paper dealing with imputations, I advanced the proposition that so far all attempts to define economic activity without using market transactions as the touchstone have been unsuccessful, and I suggested that it may not be possible to devise a viable definition of this type. The Hagen and Budd discussion of the concept of economic activity is of interest in this connection.¹

I concur with Hagen and Budd in their view that there cannot be a sharp line of demarcation between economic and noneconomic activity, but it seems to me that their principle does not establish any line of demarcation at all. Since all activities having a utile end product are considered economic, the category of play is restricted to activities that are satisfying in themselves but have no utile end product. I submit that it is not possible to think of an activity of this type. Their category of play evaporates under closer scrutiny, essentially because it is based upon a specious distinction between an activity and its end product. Take, for instance, the activity of singing in the shower—surely an example of play. It does not seem to me that one can maintain that the activity of singing is satisfying but that it does not result in a utile end product, the song.²

I hesitate to advance this radical criticism of Hagen's and Budd's views on this subject. But further study of their paper did not help me to dispel it. They do not give a single example of the category of "play"; they do not attempt to demonstrate that the proposed distinction between economic and noneconomic activity can be made to work.

In the light of the foregoing considerations, I cannot agree with Hagen and Budd in their view that the National Income Division has failed to perceive the theoretically correct boundary line between economic activity and noneconomic pursuits. Despairing of a more profound principle, we state that "the basic criterion used for distinguishing an activity as economic production is whether it is reflected in the sales and purchase transactions of the market economy."³ Hagen and Budd regard this statement as incomplete because it does not cover im-

¹ See the passage, "A more difficult issue . . . there is no sharp line" (page 232).

² In this context "utility" must be envisaged as including utility to the person engaged in the activity and not merely utility to others; otherwise Robinson Crusoe's life would be labeled as all play, a result surely not intended by Hagen and Budd.

³ *National Income Supplement, 1954, Survey of Current Business*, Dept. of Commerce, p. 30.

THE PRODUCT SIDE

putations. But these amount to only about 5 per cent of total output (this, and not the percentage of imputations in consumer expenditures they cite, is the relevant figure in this connection). Surely, one may call basic a simple rule that takes care of 95 per cent of a situation.

I am under the impression that in practice Hagen and Budd are generally satisfied with the procedures we follow with respect to imputations. The only specific proposal they make is that we add an imputation for radio broadcasting and television. An examination of the *National Income Supplement, 1954*, will show that we have no quarrel with this suggestion. I mention this because their statement (page 237) tends to create the impression that we oppose such an imputation, on rather spurious grounds.

In the *National Income Supplement, 1954*, the case of radio broadcasting and television is mentioned to illustrate the proposition that there are many legitimate additions to the present list of imputations, but that it is impossible to draw a systematic boundary line and difficult to evaluate the relative merits of the various candidates. It would be interesting to know why Hagen and Budd singled out this particular item for inclusion and not others that come to mind equally easily.

Hagen and Budd also suggest that we "do some bold estimating . . . of nonmarket economic activity. . . ." I take it that they have in mind special exploratory projects separate from our regular series. In calling for estimates of nonmarket economic activities, they seem to be motivated by the hope that these estimates will permit the construction of measures that are invariant to institutional change. "The measurement of national income should be invariant to purely institutional changes."

This statement may point to another area of disagreement between us, but I cannot explore it since Hagen and Budd do not explain to what extent they expect the broad invariance criterion to be an effective guide in actual practice. I believe that the invariance criterion is a will-o'-the-wisp if it is regarded as a basic principle capable of systematic implementation on a broad front, although I do consider it a useful prop for repair or extension work in fringe areas. It is one thing to envisage the construction of a measure of the national output that is invariant to institutional change from the fall of man to the last judgment, and another to make a rental imputation on the ground that this will tend to prevent a change in the output measure in the face of a shift between rental and owner-occupied housing.

INTERMEDIATE OUTPUT OF GOVERNMENT

I am disturbed by the complete lack of mutual understanding which separates me in this area from two persons whose thought is congenial

COMMENT

to me in so many other important respects. In the hope of localizing the source of our disagreement and of making some progress towards its resolution, I shall (1) restate my case briefly in a form best adapted to the Hagen and Budd paper; (2) review their argument; and (3) outline the course along which we might profitably guide future discussion.

1. I do not think that there is a meaningful concept of intermediate government services. But let us assume, for the sake of argument, that the free transportation of business products by the government represents a clear-cut instance of an intermediate government service (this phrase will be used interchangeably with government service to business).

Let us work with the model of an economy in which 10 workers are employed in the transportation industry, transporting business products—say oranges—and 100 workers are engaged in the production of these products. Wages per worker are \$1 and there are no other types of income or of cost.

Let us assume first that this economy is private (i.e. there is no government) and that consumers purchase oranges f.o.b. their place of production and pay separately for transportation charges (to the Railway Express Company). In this case the national output statement will be as follows:

NATIONAL OUTPUT

<i>By type of income</i>		<i>By type of product</i>
Wages	110	Oranges f.o.b. 110
		Transportation services 10
Total	110	Total 110

Now assume an institutional change. Government is introduced and provides free transportation of business products. My query is: Why should not the elements of the national output after this change has occurred be listed as before, as consisting of oranges and transportation services? I do not see any more reason for omitting transportation services after the institutional switch, on the ground that they represent intermediate services to business, than there is reason for omitting transportation services in the initial situation.

The following subsidiary points should also be noted. First, if transportation services are included regardless of who pays for them, the value of total output will be unchanged if unit prices remain unchanged, and it will change if unit prices change. In the latter case, deflation will indicate that the change is due to price movements. These

THE PRODUCT SIDE

might be attributable to various causes, which in my view it would be unnecessary to know in order to obtain a clear picture of the size of total output and of changes in it. Secondly, any value figures that might emerge are compatible with various methods of government financing. Of these there is no record in the table. Since the measure of output embodied in the table is adequate to show the size of output and its changes, it follows that it is not necessary to make particular assumptions regarding the method of government financing to arrive at a proper treatment of government in the output total. On the contrary, if the output measure were made to depend on the method of government financing, its usefulness would be impaired.

The above statement contains in condensed form the major propositions I should like to have considered. However, to help insure that I make myself understood in an area where lines of communication are notoriously defective, I shall analyze two specific types of arguments which are often advanced in trying to establish that duplication results unless government intermediate output is omitted from the total. Suppose we include government-furnished transportation services, as in the above table. Assume that these services increase without a concomitant change in oranges f.o.b., for instance because transportation has become less efficient. The total will then go up, indicating an increase in real output even though the position of consumers has not improved in a real sense. This is true, but exactly the same argument can be applied to the case in which transportation services are bought directly by consumers and no government is present.

Moreover, as I have tried to indicate in my paper, omission of the offending item from the current dollar total is not the proper remedy. The only legitimate point that might be made is that to prevent distortion oranges and transportation should be treated jointly in deflating the national product. In both cases we are confronted with the identical difficulty of inferring from changes in output to changes in satisfactions when technological conditions change.

Secondly, assume for our initial situation a private economy in which business itself pays for transportation services so that the only output directly bought by consumers are oranges c.i.f.:

NATIONAL OUTPUT

<i>By type of income</i>		<i>By type of product</i>
Wages	110	Oranges c.i.f. 110

Now assume an institutional change. Government is introduced and provides free transportation services to business. Then, the argu-

ment goes, if government intermediate services are counted, real national product will show a spurious increase, because the quantity of oranges will be the same in both situations, but transportation services, previously not listed, will now be separately enumerated. This proposition, it should be noted, is based on the assumption that deflation procedures are such that business product consisting of oranges f.o.b. is regarded as equivalent to business product consisting of oranges c.i.f.

Again, the argument is not specific to government. A precise analogy can be constructed in a situation in which no government is present. Instead of assuming that the government takes over the provision of transportation services, assume that consumers start paying directly for these services. Real national product will then show a spurious increase, because the quantity of oranges will be the same in both situations, but transportation services, previously not listed, will now be separately enumerated. This is the case which I have diagnosed in my paper as stemming from what might be called a statistical error in deflation. There has occurred a change in the nature of the product provided by the original enterprise; and this change is missed by the deflation procedure which the proponents of the argument postulate—a procedure in which business product consisting of f.o.b. oranges is counted as equivalent to business product consisting of c.i.f. oranges, although there is actually no more justification to do so than to count cloth as the equivalent of suits. Clearly, no “duplication” in the current dollar estimate is involved. All that is required is that we be on our toes when we deflate the national product—both its government and private components.

2. After giving their summary of our views on the treatment of government, Hagen and Budd present what appears to be their central criticism of our procedure—that our method of valuation of the government sector is not invariant to institutional change.⁴

As I have indicated already, I believe that the invariance criterion cannot be used as a general standard for evaluating the adequacy of national output definitions. But this is merely an aside in the present connection. Rather, what I want to establish is, first, that the violation which Hagen and Budd have discovered is nothing unique to the government and that it can result equally in a private economy in which no government is present; and, second, that it has no relevance to the current dollar figures, and merely calls for refinement in deflation techniques.

Simply modify the Hagen and Budd example by assuming that a

⁴ “We do not believe . . . real national product” (page 240).

THE PRODUCT SIDE

separate private enterprise takes over the functions of policing and road maintenance initially performed by the logging company itself, and that consumers pay this enterprise directly for the sake of getting the goods. The last paragraph in the passage just cited would read as follows:

“Suppose that a manufacturing concern employs its own night guards, or that a logging company has constructed a road on which it hauls its logs. Suppose now that a separate business enterprise takes over these functions and is paid directly by consumers for its services. In either case, even though no change whatever occurs in the productive processes or the goods available to the economy, the NID method would show an increase in real national product.”

As the reader will notice, the Hagen and Budd case is exactly the same as the last illustration I used in the restatement of my argument in terms of the orange-transportation model. No duplication in the current dollar figures is involved. The phenomenon arises, both in the government and in the private sphere, because of an assumed imperfection in the techniques of deflation. In the light of this analysis, I cannot see that Hagen and Budd have successfully demonstrated that our treatment of government leads to a unique phenomenon of “duplication.”

The reader is referred to the paragraph immediately following the logging company example because it seems to contain a more generalized formulation of their critique of our position. But I must confess that I do not understand the argument which it embodies, nor its exact logical relation to their earlier reasoning based on the invariance criterion.

3. a. The types of faulty inferences from national output data which have been erroneously attributed to “duplication” are in no way unique to the government but occur in connection with private consumption as well. Faulty inferences from changes in national output to changes in consumer satisfaction are likely to be drawn when there are changes in needs and technological conditions, and also when institutional changes occur. Omission of items from the current dollar totals is not the proper remedy in any of these cases. Some of them can be tackled in the deflation of gross national product, although probably only with limited success. I have made these points in my paper, and in the present comments I have tried to make my case as specific as possible by further supplementing my discussion with concrete examples. I used the orange example and the continuation of the example

COMMENT

in the Hagen and Budd paper, concentrating on the "technological" and "institutional" shifts, since Hagen and Budd seem to steer clear of cases that are based on changing needs. From my standpoint further discussion will be most helpful if it is organized around these examples.

b. An alternative procedure would be a restatement and amplification of the authors' general argument against the approach which I propose. I have referred to what I believe to be the relevant paragraph in their paper and have stated frankly that I do not understand it. I consider this alternative as less likely to lead to mutual understanding than the first one sketched. If nevertheless it is chosen, special care should be taken to define the terms "value" and "product" unambiguously, if they are employed in the discussion. That the term "value" can take on many different meanings is obvious; in the use of the term "product" the main point to be made clear is whether one thinks of it as including or excluding the various services that get attached to the material substratum in the course of production—in terms of the orange example, whether one means oranges f.o.b. or c.i.f.

c. Hagen and Budd might also strengthen the case for the method which they propose. What I would find most helpful in this connection are definitions of government "final" and "intermediate" goods. In the private sphere we mean by an intermediate product a good that is purchased by business and charged to expense. All other goods are final. The nature of a good cannot be established by reference to its technical characteristics, for example, flour is intermediate when bought by bakeries but final when bought by housewives. In the absence of the purchase criterion, on what basis does the classification of government services rest? To the best of my knowledge, this question has never been answered in the extensive literature on the subject.

d. It would also be helpful if Hagen and Budd provided a concrete classification conforming to the general definition, which could then be put to practical test. It would have to be shown that use of this list would eliminate such concrete distortions as they might be able to demonstrate are inherent in the present procedure. To my mind, one of the most extraordinary features of the government discussion is that none of those who consider the task of eliminating government intermediate services as most urgent, and spend a great deal of effort and ingenuity to argue this in a general manner, have found it worth while to buckle down and actually perform the task.

To temper the impression of pervasive lack of communication and disagreement, I should like to end my comments on the measurement

THE PRODUCT SIDE

of government by drawing attention to an important issue on which agreement is apparently being reached. I am pleased that Hagen and Budd recognize the autonomy of the factor cost concept, differing in this respect from most of those who advocate the elimination of the intermediate services of the government by the specific identification approach.⁵ I have noted a similar rapprochement in connection with the Bowman and Easterlin paper.

CAPITAL FORMATION AND ALLIED MATTERS

I have not been able to follow the Hagen and Budd discussion of the concepts of capital formation and consumption in all respects, but I do not think that there is basic disagreement between us. Their positive reference (in note 56) to Edward F. Denison's article confirms me in this impression. As is apparent from my paper, I regard Denison's diagnosis of the conceptual problems of measuring capital formation as the most convincing one that has been presented so far, although I see some difficulties which I should like to explore further before I subscribe to it fully.

Hagen and Budd appear to be puzzled by our reluctance to depart from the accounting measures of depreciation. I hope I have made clear in my paper the considerations that have led to this cautious attitude. The present discussion further confirms my feeling that it would be eminently desirable to have greater agreement and greater clarity about the interpretation of the measures of capital formation and consumption than we have now before the treatment of depreciation in the official statistics is changed. I, in turn, am surprised that Hagen and Budd are not struck by the fact that so much in this area remains controversial and obscure, and that they do not mention this as a valid reason for hesitating to change the official estimates.

The following specific comments relate to details of their discussion:

I find somewhat confusing the connection which they apparently see between the allocation of depreciation according to the service-output method, on the one hand, and capital gains and losses and the stabilization of the net rate of return on investment over the business cycle, on the other (page 263). Their recommendation that the service-output method be adopted is understandable if we recognize that they do not take into account a host of detailed difficulties that would emerge if one tried to implement this procedure. But do they suggest also that

⁵ An earlier paper of Hagen's, written jointly with Gottfried Haberler, "Taxes, Government Expenditures, and National Income" (*Studies in Income and Wealth, Volume Eight*, National Bureau of Economic Research, 1946), left no room for the factor cost concept.

COMMENT

depreciation charges could or should be manipulated so as to regularize the return on investment? If they have this idea in mind, they should elaborate it further.

My major differences with Hagen and Budd regarding the imputation of a rate of return on government capital can be established adequately by reference to my paper. However, two points may be noted. In the first place, they are singularly generous in staking out the "areas in which the estimating problem would be easiest . . ." (page 270). For instance, they include roads. In my opinion the calculation of an imputed rate of return on roads is the fantasy of academicians and could become the nightmare of statisticians. (And not primarily because the data are not good enough, as is usually said soothingly on similar occasions, but because the theoretical concept to be quantified is so inept.)

Secondly, the Hagen and Budd argument that the omission of a rate of return on government property would be justified only if the most reasonable estimate were zero, is attractive but flimsy. There are many items for which the most reasonable estimate is not zero, and which are nevertheless better omitted from the estimates. Hagen and Budd themselves recognize this in the case of consumer durables (note 74) and other imputations.⁶

COMMODITIES AND SERVICES

The Hagen and Budd discussion of the classification of consumer expenditures is addressed mainly to the distinction between commodities and services. I do not myself believe that this distinction is of great significance. But Hagen and Budd have gone too far in arguing that a reasonable distinction of this type cannot be made. It seems to me that the broad distinction can be conveyed by saying that commodities can be inventoried and services cannot, and I should not be surprised if this technical distinction had economic significance. Accordingly, I am less dissatisfied than they are with this principle of classification, although I do not rule out the possibility that we have misclassified marginal cases. Incidentally, in citing examples to illustrate the ineptness of our present procedure Hagen and Budd would have been more convincing had they been able to cite items of substance instead of picking trifling ones (e.g. pets) whose present classification is due to limitations of the statistical information rather than to any genuine difficulty in the application of the commodity-service distinction.

⁶ Their reasoning in note 79 implies that the present procedure of omitting depreciation on government capital overstates the net national product. But in fact it understates the gross national product.

THE PRODUCT SIDE

On the Ross Paper

Most of my comments on Kenneth D. Ross' paper are illustrations or elaborations of points which I developed in my paper, and are therefore presented in the order used there.

THE ACCOUNTING APPROACH

Ross is critical of the accounting approach to national income measurement (page 298); I consider this approach valuable. I think we mean different things when we refer to it. To me, the accounting approach is one that shows the economic process in terms of transactions by sectors of the economy. Such a picture probably must be organized around the concept of production and must distinguish between current and capital transactions. Furthermore, it should show that incomings and outgoings are in some sense equal. Perhaps Ross will agree that the accounting approach, so defined, is a fruitful one (see his introductory discussion, which includes a sketch of the advantages of the accounting approach understood in this broad sense). Whether accounts containing debits and credits, equations, matrixes, or sources-and-uses-of-funds tables are to be used is a separate question. I certainly do not consider the first of these devices, at which Ross' criticism is basically directed, to be the essence of the approach.

Although I do not feel strongly about the form of presentation, the device of accounts with debits and credits may be best for many users. These users find equations and matrix presentation somewhat forbidding, and are not satisfied with ordinary tabulations, which do not focus exactly on the equality of incomes and outgoes or on interrelationships. They find the credit-debit device appealing because it is a precise tool and also because it reminds them constantly of the affinity between national income concepts and the categories of business accounting.

One of Ross' objections to this device could be met by improving the terminology. But he is right that the account form is not advantageous for time series and that the term "accounting" may encourage the mistaken assumption that the national accounts, like private accounts, automatically balance without statistical discrepancy.

Ross mentions with approval the tendency among business accountants to depart from technical terminology and to present information in more popular forms. I am familiar with the handsome annual reports to stockholders, with pictures, ideograms, and many-colored graphs. We too could package some of our results more attractively, and perhaps this would be a worthy thing to do. However, I trust that we have a broad audience of people willing to put up with some technical

COMMENT

complexity for the sake of gaining a more profound understanding of our work.

THE FACTOR COST CONCEPT

In addition to the commonly recognized difficulties of the factor cost concept, Ross mentions two others. He maintains, first, that the factor cost concept is based upon the assumption that the output of the country is entirely attributable to domestic factors and considers the assumption invalid since the cost of a high proportion of goods includes an additional element—imported materials (page 279). I cannot understand this argument well enough to criticize it in detail. It is probably related to Ross' proposal to include imports in total output, on which I comment below. Surely imports are irrelevant in this connection, since they are part of the output not of the importing but of the exporting country.

Ross maintains, secondly, that the factor cost concept is based upon the assumption that the factors can be separated one from another and notes that this cannot be done. (page 279). I agree that it is impossible to attribute the various incomes as we measure them to separate factors of production. But fortunately such a separation is not necessary for the construction of a measure of total output at factor cost.

Ross suggests that payments to former members of the armed forces should not be classified as transfer payments but should be allocated to the period of military service and then considered as part of income earned in production. This suggestion points up neatly the nature of the decisions that have to be made in constructing a useful measure of factor cost. In logic there is nothing wrong with his proposal. Nevertheless I should very much dislike to implement it. Unlike Ross I do not believe that we could anticipate the future course of payments to veterans with sufficient accuracy to prevent large retroactive adjustments. Moreover, even if the adjustments were not large it would be annoying to have them occur at all for any year on which the books could otherwise be closed. Finally, unless there are countervailing considerations, it is inadvisable to include in a given year's figures income flows of which the presumed payors and recipients are not aware or to exclude flows of which they are aware. A more realistic relative valuation of military and other output does not impress me as being a particularly weighty counterconsideration; treatment of veterans' pensions on an accrual basis would merely touch the periphery of the basic problem.

Ross asserts that we exclude government interest from the measure of national output because it reflects payments on war debt. Actually, the interest on war debt merely provides a leading example of the

THE PRODUCT SIDE

general lack of correspondence between the services of government-owned capital and government interest. This lack is the reason for excluding these payments. Ross argues that "The actual justification for complete exclusion is the fact that the amount government spends for goods and services is not affected by the source of funds—whether the money comes from taxes or new debt." But this argument begs the essential question: Is government interest a return for services or is it not? In reasoning that it is not, I refer specifically to the lack of correspondence between the use of physical capital and interest payments, and while admitting that lending could be designated as a factor service, submit that no useful purpose would be served by such a construction. Ross apparently believes that some pre-established general concept of "goods and services" dictates the exclusion of government interest payments, and that accordingly we can dispense here with purpose-oriented reasoning.

With respect to his comments on taxes, defining personal income to include social security levies would not result in a change in the factor cost total as now defined. But we should welcome suggestions for an improved classification of taxes if Ross is dissatisfied with our present one.

He contributes a useful point by making it explicit that the factor cost concept as a tool of analysis is bedeviled by the difficulties of measuring depreciation. In the usual discussion of the problem—including the one in my paper—no cross reference to depreciation is made.

IMPUTATIONS

Ross' reasoning is a good example of the view that a general principle can clearly determine what specific items belong on an analytically satisfactory list of imputations. Referring to his three basic principles of output measurement—that only commercial output should be included, that output should be counted at market prices, and that each element of output should be counted only once—he writes that "Definite acceptance of these three principles would put an end to most of the argument and counterargument. No basis for dissent would exist provided treatment of an item in question was consistent with the three propositions."

Without noting the ambiguities of the phrase, "commercial" production, he uses this touchstone to condemn the rental imputation out of hand. But in fact there is no clear distinction between what is and what is not commercial. In the no-man's-land in which we are groping our way, within very broad limits "commercial" includes what we define it to include.

COMMENT

CAPITAL FORMATION

As I explained in my paper, I would move slowly in extending the capital concept to government and to consumers. But I would not be inclined to go in the opposite direction, as Ross suggests. He would shift purchases of homes for family living (and construction by non-profit institutions) from the category of investment to that of consumer expenditures. I think that from a normative standpoint systematic accounting for items of wealth as important as housing should be encouraged. From a behavioral standpoint also, the treatment of purchases of residences as capital formation rather than as consumption makes sense.

Treatment of houses as capital formation would be compatible with the omission of net imputed rent, but I would not think that this would be an improvement. There is a clear item of income involved here, which we can take into account by means of procedures that are reasonably realistic. Even if some studies of market behavior should call for a cash concept, all that would be required would be the segregation of the cash from the imputed items; this we already provide on an annual basis.⁷

A novel approach to the complex problem of measuring capital consumption is suggested by Ross. "Under the 'once but only once' rule the amount to be eliminated for output purposes is not the capital actually consumed, but instead the depreciation which producers include in costs. It would be quite incorrect to take out any other amount than that which has been put in for pricing purposes . . . the market price criterion . . . avoids the difficulties of correctly establishing capital use. The only germane figure is the total contained in the selling prices of goods and services."

I will not address myself once more to Ross' belief that valid solutions for complex problems can be deduced by simple reference to a few general rules, but shall discuss his proposal directly. First, the pricing process envisaged by Ross is certainly not typical in the real world. There is no reason to believe that businesses in general attempt to set their current prices by reference to calculations which make a specific allowance for depreciation; and there is even less reason to believe that they would succeed in obtaining such prices in the market. Thus the question "What depreciation charges enter market prices?" cannot be answered in a causal sense. (I assume it is in this sense that he

⁷ It may be noted that imputation often results in estimates that are statistically more reliable than cash estimates would be (see *National Income Supplement, 1954, Survey of Current Business*, Dept. of Commerce, p. 46).

THE PRODUCT SIDE

poses it, since if he were referring merely to the question of what depreciation charges one actually made he would have little reason to attack our present procedure.)

Secondly, I do not see in what sense it can be maintained that "to derive output totals, ascertaining the actual exhaustion of capital is entirely irrelevant. That effort becomes pertinent only when the inquiry is extended to such fields as consumption and wealth." Output is the sum of consumption and changes in wealth. The standard of measurement applicable to the total must be the same as those that apply to the components.

In commenting on our work, Ross asserts that we apparently have made little progress in resolving the depreciation question and that a paper by Edward F. Denison indicates that we regard the problem as insoluble (page 282). Two remarks are in order. First, we have made considerable progress in revaluing depreciation charges.⁸ Secondly, we contemplate further work, as is evident not only from my paper in this volume but also from Denison's paper. I do not recognize the latter paper in Ross' summary of it. Because of space limitations, I leave a detailed comparison to the reader, and limit myself to a single quotation. Denison writes: "I am hopeful that estimates which are sufficiently reliable within broad limits to warrant introduction into the official estimates of national product can in time be derived."

INTERNATIONAL TRANSACTIONS

Ross appears to advocate a measure of national output gross of the value of imports. A total so constructed would reflect not only the output of the given country but also part of the production of the country supplying the imports, and would therefore not be a measure of domestic or national output. Needless to say, value added to imports by the importing country is included in national output, and properly so. It is the inclusion of the value of the imports themselves which would constitute duplication.

In this connection the reader should perhaps refer to Ross's example. He envisages two situations, each with a total gross national product of \$360 billion but varying amounts of offsetting sales to and purchases from abroad—\$15 billion and \$25 billion. "An observer who did not look behind the figures would conclude that activity was the same in the two periods. This was far from the case."

It seems to me that the "activity" corresponding to the imports

⁸ See, for instance, Raymond Nassimbene and Donald G. Wooden, "Business Equipment, 1929-53—Measures of Purchases, Depreciation, Retirements, and Stocks," *Survey of Current Business*, December 1954.

COMMENT

which should and does get reflected in national product is the value added to imports. If imports are larger, this value added is likely to be larger, and will affect the gross national product accordingly. If total gross national product nevertheless stays at \$360 billion, some other value added must have decreased, and the observer who did not "look behind the figures" would conclude correctly that the value of activity was the same in both periods.

The matter is really rather elementary. Suppose that in a year the only economic event was the landing of a case of Scotch whisky upon our shores. Would Ross seriously argue that this merchandise represented output of the United States? If he did, I am curious how he would use the "once but only once" rule to adjudicate the conflict that would undoubtedly arise between American and British national income estimators.

STATISTICAL ASPECTS

I shall confine to two points my comment on Ross' discussion of the statistical aspects of our data. First, he underscores rather heavily the inaccuracies of our data and the consequent limitations on their practical usefulness. While sharing his concern over this matter, I note that Ross himself is one of the most avid consumers of our statistics, and so I venture to hope that he may have exaggerated his true view of their limitations.

Secondly, Ross states that we publish our quarterly information with an average lag of three months. I had been in the habit of saying that our lag was one-half of this—six weeks—and upon reading Ross' paper I felt guilty of a serious misstatement, until I analyzed his proposition more closely. In a nutshell, this proposition implies that if a corporation published an annual statement on December 31, it would be reporting with a lag of six months. In fact, the only way of getting out of the doghouse which he has so artfully constructed is to forecast one-half of the period of reference. A humble estimator, as distinguished from a forecaster, has no more chance to be current by Ross' standards than has Achilles to overtake the turtle.

REPLY BY MR. HAGEN

During the discussions at the Conference, much progress was made in the mutual understanding of divergent views concerning the treatment of government services that aid private production. It became clear that the papers prepared before the Conference do not lay bare for the reader some of the basic causes of divergent views.

Desire to avoid delay in publication made a rewriting of relevant

THE PRODUCT SIDE

sections of several papers, and specifically of the Hagen-Budd paper, seem impracticable. I regret this, since I believe that a much clearer statement of the points at issue is now possible. To hold this reply to appropriate length, I shall make only a very summary restatement here. Except for a brief reference to the problem of bounding economic activity, I shall not discuss other topics included in the Hagen and Budd paper. In the discussion of government intermediate product, I answer the highly appropriate questions raised by George Jaszi in his comment section without explicit reference to them.

Concerning the distinction between economic and noneconomic activity, it need only be noted that Budd and I do not propose any change in the present NID practice in measuring American national product. We suggest merely that the NID should indicate clearly the magnitude of various marginal streams of activity, and estimate some not included in the American national product total, to make possible the use of appropriately differing aggregates for various interspatial or intertemporal comparisons.

VALUATION OF GOVERNMENT INTERMEDIATE PRODUCT

An intermediate product is one which "enters into," that is, is necessary for, the production of a final product. A government intermediate product is one provided by the government. If a private firm producing an intermediate or final product receives a service from the government, and would have to procure the service elsewhere to accomplish its own production if the government did not provide it, then the government service is an intermediate product. A government intermediate product may also contribute to the production of a government final product.

Two essential differences in product valuation result from separate inclusion and exclusion respectively of government intermediate product:

1. They involve a different relative valuation of products into whose production varying proportions of government intermediate services enter.

2. They result in a different relative valuation of aggregate output in two situations in which there are different proportions of products into which government intermediate services enter. (While this case may be listed separately, it is a special case of paragraph 1.)

Thus the issue is operational and not merely metaphysical. In each case, the question arises which relative valuation is the more reasonable

COMMENT

or appropriate. Neither comparison need involve deflation. In the second, the relative value of undeflated aggregate final product in the two situations may be in the point.

The argument for exclusion of government intermediate services is simply that the relative unit value of products which are unrationed is equal to the ratio between their prices. This is true simply because each buyer will purchase such quantities of different products that, in old-fashioned terms, the marginal utility of each is equal to its price—or, more accurately, to avoid the connotation of cardinally measurable utility, the marginal rate of substitution between them¹ is equal to the ratio between their prices.

An example will make clear the relevance to the problem at hand. Each buyer who finds two products available, one priced at 110 and one at 50, will buy such an amount of each that his marginal rate of substitution between them is equal to the ratio 110/50. If the amount purchased of the first is X and of the second is Y , the relative aggregate value of the two products will be equal to the ratio $110X/50Y$ —that is, will be equal to their relative market values.

If the price of the first falls to 100, because the government is now providing an intermediate product without charge, or for any other reason, each buyer² will now buy a sufficiently larger relative amount of that product so that the marginal rate of substitution falls to 100/50. If the amounts of the two products that he now purchases are $(X + a)$ and $(Y - b)$ respectively, the relative aggregate value of the two products will be equal to the ratio $100(X + a)/50(Y - b)$. It will not be equal to $110(X + a)/50(Y - b)$, as would be indicated if the value of government intermediate product is included, simply because at the lower relative price of the first product each buyer will purchase more, so that the “relative marginal utility” is no longer 110/50, but instead is only 100/50.³

At this point, if I understand Jaszi correctly, he argues that the government service, for example, transportation of the oranges, should be considered as a separate final product. This treatment is entirely logical in some cases. But since the service is free to the buyer and is available in any quantity he chooses to obtain, he will obtain enough

¹ In terms which assume cardinally measurable utility, their “relative marginal utility.” For simplicity, in addressing readers not familiar with the newer terminology, I shall use this terminology below. For correctness, it should be translated into the terminology of marginal rate of substitution.

² Omitting the limiting cases of buyers whose indifference curves are horizontal or vertical.

³ Of course these relations hold perfectly true only in an analytical model, but all national income measurement is based on this model.

THE PRODUCT SIDE

so that its relative marginal utility is zero, and the service should be valued at zero. The buyer purchasing oranges plus the transportation service gets the two combined for 100 plus zero, and will buy such a quantity of the two that the marginal utility of each combined unit, relative to that of each other good, is equal to the ratio of 100 (not 110) to the other price. They should be valued at 100.

But while the service is free to the buyer, it has a cost to someone. It uses productive resources. Is it logical to argue that the government will provide services having a cost whose market value is zero? It is. The government service increases the productivity of private production. If the value of the physical increase in the quantity of private production made possible by the government service is greater than the cost of the governmental activity (waiving the question of distribution of costs and benefits) the activity is worthwhile. But its contribution is wholly reflected in the market value of the increased private output.⁴

It follows that if government intermediate product constitutes a different proportion of the value of two products, their relative value is incorrectly stated if the government intermediate product is valued at other than zero. The same is true of the output of two sectors of the economy, or of total national product in two situations, measured at current prices.

DEFLATION IN RELATION TO GOVERNMENT INTERMEDIATE PRODUCT

Under the conventional rules of deflation (as used, for example, by the Department of Commerce in estimating output from 1929 to date in constant prices), only private productive services are regarded as entering into the production of private final product. As a consequence, conventional deflation methods plus separate inclusion of government intermediate product result in a change in measured real product when an intermediate service previously performed by private enterprise is undertaken by government, or the reverse. Jaszi has noted that this indicates an error in deflation. In a deflated series, either the intermediate product should be excluded after it has been assumed by government, as it was when produced privately, or it should be included separately from the value of private final product, even while it is pro-

⁴P. A. Samuelson, in advancing this argument, has suggested rain-making as a case which illustrates the point clearly.

Taxpayers collectively may choose to recoup the financial costs of the government contribution to private output in the selling price of the output (via indirect taxes), in taxes levied on some other base, or by offsetting the hoarding of purchasing power by someone. This choice affects the distribution of the costs and benefits, but not their nature.

COMMENT

duced privately. This is the usual index number problem, and the rules of deflation indicate no choice between the two methods, but the rules of valuation indicated above direct that the intermediate product should not be included separately in either situation.

Present NID procedures, which exclude the intermediate product in the one case and include it in the other, result in an aberrant comparison. In the short run, such institutional changes are small, but in the long run and in some international comparisons the differences are great.

Jaszi has noted that such institutional changes do not relate uniquely to government. This of course is true. The problem should be attacked wherever it is empirically feasible to do so. The problem of government intermediate product should be attacked, not only because of the deflation problem, but also because of the incorrect relative valuations in current prices resulting from incorrect treatment.

The magnitude of government intermediate product is in question. Such product includes, for example, services of highways and airports to business users, fire and police protection of business property, business information and regulatory activities, and a share of general government administrative costs proportionate to the share of total direct government intermediate services to total government final services. It does not include education (other than certain special educational services to businessmen) or defense. Difficult statistical problems of allocation occur, but they may be no greater than those disposed of by cost accounting in a great variety of private business situations. Gerhard Colm, in *Volume One* of *Studies in Income and Wealth*,⁵ gave an illustrative classification of government product in the United States in 1932. He estimated that intermediate products of government—cost services, as he termed them—constituted somewhat more than one-third of the output of government in the United States in that year. The fraction would probably be considerably smaller now, because of the greatly increased relative importance of defense expenditures. We suggest that the magnitude be investigated by the National Income Division.

MEASUREMENT OF OUTPUT BY FACTOR COSTS

Contrary to Jaszi's position, his logic should lead to measurement of output by factor costs. Government money subsidies to private producers used to pay factors of production are analogous to government services that aid private production. If the value of the latter is to be

⁵ Pages 209-212.

THE PRODUCT SIDE

recorded in national income, in addition to the market value of the private final products, one can argue that government money subsidies should also be included. And, since indirect business taxes are negative subsidies (or subsidies are negative business taxes), they should be deducted. The total resulting after these additions and subtractions is the total of factor costs.

Jaszi's position forces him to reject at least the deduction of indirect business taxes. Department of Commerce practice also rejects inclusion of financial subsidies. This deviation from consistency is arbitrary, but this touch of inelegance does not in itself seem to me to be fatal.

REPLY BY MR. BUDD

It is apparent from a comparison of George Jaszi's own paper with ours that we are in broad agreement on many, if not most, of the issues raised in our own paper. Jaszi's comment confirms this conclusion. Aside from the issue of government intermediate products, his remarks relate largely to minor differences between us on modifications we have suggested or in the rationale underlying them, matters which the reader can judge for himself without the need for further comment on my part.

With respect to the major point at issue, I am in almost complete agreement with Hagen's reply. It seems to me that the present NID procedure can be rationalized only for a factor cost valuation of output (the present definition of national income), where government intermediate services are in effect considered as subsidies in kind and treated in the same fashion as monetary subsidies and indirect taxes ("negative subsidies").

Such a measure of net national product at factor cost is useful and important in its own right. But it does not obviate the need for a more consistent market price valuation of net national product, which requires that subsidies in kind represented by intermediate government services, as well as monetary grants, be excluded.¹ For current dollar estimates (where intertemporal comparisons and hence problems of deflation are not involved), the failure to exclude government intermediate services leads, as Hagen points out, to the overweighting of products which use a relatively high proportion of such services. If the value of

¹ The NID recognizes that "it might be preferable to view [government purchases reflecting clear-cut aid to business] as 'subsidies in kind' and, in accord with the handling of subsidies, to eliminate them from government purchases and the national product" (*National Income, 1954, Survey of Current Business*, Dept. of Commerce, p. 39). This treatment is rejected largely on grounds of lack of feasibility and statistical difficulty, but not, apparently, on conceptual grounds.

COMMENT

these services is not assigned to the goods to whose production they contribute but merely added to government purchases (the current NID practice), the importance of government purchases relative to other components of privately purchased final products will be overstated.

For intertemporal comparisons, a further problem is raised concerning the invariance of real output to shifts in the performance of intermediate services between business and government. While none of us would attempt to apply the invariance test from the fall of man to the last judgment, for the relevant period from 1929 to the present Hagen and I would take this principle more seriously than does Jaszi. Nor does the problem of invariance to institutional changes arise merely because of a deficiency in deflation technique (unless the latter is very broadly defined). If, for example, the government formerly granted money subsidies to business firms to cover the cost of the latter's purchase of a particular input, and now withdraws the subsidy but furnishes the input itself free of charge to the same firms, real net national product as measured by NID will show a rise, even though product prices (as well as national income) remain unchanged.

We recognize, of course, that the problem of invariance to institutional change arises outside the confines of government. Jaszi lays great stress, in his "consumer analogy," on institutional changes in the character and quality of final products when the consumer pays separately for a service which was previously paid for by business and included as part of some other final product, transportation services being his favorite example. No disagreement, however, appears to exist, at least on conceptual grounds, on the manner in which such cases should be treated in either current or constant dollar estimates. For constant dollar estimates, the institutional change must be isolated and a decision on weights must be reached. If base year weights are used and the consumer is currently paying separately for a service which has been detached from the product in which it was previously included, the current value of the service should be excluded unless the price indexes being used can be corrected for the change in the character of final products.

The preceding discussion of invariance refers only to institutional changes, and not to Jaszi's other categories of changes in needs and in technological conditions. Even if one desired to make real output independent of shifts in tastes, one could not; and, in my view, it is not even desirable to make real output invariant to shifts in production functions—or factor supplies. If, for example, the efficiency of the transportation system is reduced, real output should, and would, show a fall. The introduction of new products and technological changes in

THE PRODUCT SIDE

the quality of old ones raise problems for a real output measure that cannot be discussed here. But the resolution of the controversy on intermediate government services does not need to depend on the solution of many other problems in the measurement and interpretation of real output.

PART IV

