FOREWORD

Estimating the Nation's gross national product (GNP) is a detailed and complicated statistical undertaking. GNP estimates affect the Nation's economic well-being through major policy decisions that are influenced by the movement of GNP and other economic indicators. The numerous statistical data sources, methodology, and concepts used in measuring the economy's performance raise questions about how accurate the GNP estimates are and how accurate they can and should be.

This staff study on GNP is part of our effort to identify issues and problems relating to the estimates' present and future uses. We did not attempt to fully examine any one specific issue nor did we intend for our list to be all-inclusive. Rather, we wanted to identify issues and problems which are deemed important and worthy of further attention. This information is presented to focus attention on the GNP and encourage others to express their views on the issues.

We invite your views on the issues raised in this study and additional issues on GNP which need attention. Please address all comments to Robert W. Gramling, Group Director, U.S. General Accounting Office, Room 3844, 441 G Street, N.W., Washington, D.C. 20548. We look forward to hearing from you.

W. J. Anderson

Director
General Government Division

D I G E S T

The national income and product accounts, summarized by the gross national product (GNP), provide a broad overview of economic activity and are among the most important and widely used Federal economic statistics. GNP measures the Nation's annual output of final goods and services at their market value. (See ch. 2.)

Federal policymakers use GNP and related measures in making decisions which affect billions of dollars of the Nation's output and associated jobs, purchasing power, and the allocation of resources. The importance of economic policy decisions in affecting the state of the economy demands that congressional as well as executive branch policymakers have reasonably accurate data on which to base these decisions. (See ch. 1.)

Prior efforts in addressing the issues surrounding the GNP's accuracy and reliability, methods, and concepts have brought changes to the estimates. In this study, GAO discusses several issues within these broad areas that are still unresolved. The issues GAO identified are not presumed to be all-inclusive nor does this study suggest how these issues should be resolved. Rather, the intent of this study is to draw attention to the issues and encourage others to express their views. (See ch. 8.)

HOW GNP IS ESTIMATED

The Department of Commerce's Bureau of Economic Analysis (BEA) prepares GNP estimates quarterly (at annual rates) and annually. The estimates are constructed from numerous data series collected by Federal and private sources. Since the data are collected to meet other statistical needs, many of the series require adjustments to meet GNP definition. Any single GNP estimate after its initial release is subject to at least seven revisions, mainly to incorporate subsequently available and revised source data. (See ch. 2.)

BEA's process of estimating GNP blends standard procedures and judgments. Once the source data have been obtained by BEA, many different procedures are used to estimate the individual component estimates and the total GNP. Standard procedures are not always used to prepare the current estimates, adjustments are made where BEA believes more accurate data will result. Judgments of BEA officials are used during the estimation process to fill missing gaps of source data, especially for the initial estimates where source data projections are used. Detailed information on BEA's estimating methodology is not readily accessible to users, although users want to know the actual procedures used. (See ch. 6.)

ISSUES ADDRESSED

The GNP, given its important economic policymaking uses, should be reasonably accurate and consistent in representing national output and income levels and changes. BEA contends that for short term policymaking uses, accurate measurements of quarter-to-quarter changes are more important than an accurate measurement of GNP's level. The accuracy of GNP is uncertain because of the lack of error measures. How much accuracy is needed in GNP is uncertain because of the difficulty with identifying the policymaking errors which can be attributed solely to inaccurate GNP estimates. (See ch. 3.)

Since precise error measures are lacking, alternative means have been used to evaluate the reliability of quarterly GNP estimates. The primary means have been examining the revisions and judging the quality of the source data. Three major studies which examined the revisions for similar periods differed, however, in their conclusions on the estimates' overall reliability for policymaking uses. (See ch. 4.)

Motivated by substantial revisions to GNP estimates in the early 1970s, independent national accounts experts evaluated the underlying source data, found many areas in need of improvement and recommended many changes. Implementation of the 1977 recommendations has fallen behind schedule. However, it also appears that the need for the improvements in terms of improved economic decisionmaking ability has not been adequately demonstrated. (See ch. 5.)

A final issue is the role of BEA's judgments which are reflected in GNP estimates by the concepts and classifications it selects. What GNP should measure has been at issue for some time. The experts have differed on GNP's definition since its creation. Experts outside BEA are not unanimous in their support of what changes should be made. Changes have been made on some conceptual matters recommended by outside experts, but unresolved issues still exist. (See ch. 7.)

Contents

ABBREVIATIONS

BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
CPI	Consumer Price Index
FTC	Federal Trade Commission
GNP	Gross National Product
PPI	Producer Price Index

CHAPTER 1

INTRODUCTION

The national income and product accounts, summarized by the gross national product (GNP), are among the most important and widely used Federal economic statistics. The accounts, which collectively provide a broad overview of economic activity, are one of several economic accounting activities of the Department of Commerce's Bureau of Economic Analysis (BEA). Other national economic accounts compiled by BEA measure the Nation's wealth, international payments, interindustry economic activity, and regional economic activity. BEA supplements these various measurements by analyzing business cycles and trends. Since the national income and product accounts provide comprehensive measures of the Nation's current economic output, they are the most widely used of all the national economic accounts.

Subsequent revisions to the published GNP have on a few occasions drawn complaints from economic policymakers who claimed that the preliminary estimates had misled their analysis of needed actions. On other occasions, although not as critical, revisions to GNP gave a somewhat different picture of the state of the economy. Policymakers use GNP and related measures in making decisions which affect billions of dollars of the Nation's output and associated jobs, purchasing power, and allocation of resources.

WHAT ARE THE NATIONAL INCOME AND PRODUCT ACCOUNTS?

The national income and product accounts are a means of measuring the Nation's annual output of final goods and services at their market value. The accounts register the economy's output of finished goods and services and the incomes which flow to resource owners from their contribution to output. The accounts thus present for the Nation's economy the sort of information contained in a business' profit and loss statement or a household budget. They balance the flow of income earned against the flow of spending on the economy's output of goods and services.

The national income and product accounts consist of five interrelated accounts. The national income and product account summarizes total economic activity. It relates the market value of the year's final output (GNP) by type of purchaser to the earnings of those contributing to output by type of income. The remaining four accounts highlight activity in the economy's major sectors. The personal income and outlay account, which focuses on the total households in the economy, relates income received by source of income to how they were disposed. The government receipts and expenditures account relates the revenues of all governments by source to government spending by type of outlay.

The foreign transactions account summarizes output and income flowing to and from foreigners. The gross savings and investment account relates savings from the year's income available for financing capital formation to investment spending.

These five accounts are interrelated because (1) entries in the household, government, foreign, and saving and investment accounts are the basic entries comprising the summary measures of GNP, national income, and other components in the national income and product account and (2) the four accounts which the national income and product account summarizes also have interrelating entries among themselves. An illustration of the accounts' interrelationship is shown on the following page. For example, the basic GNP components of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government purchases of goods and services in the national income and product account are also key components in the other four accounts. GNP thus represents total spending by the institutional sectors represented in the accounts on the economy's output of final goods and services.

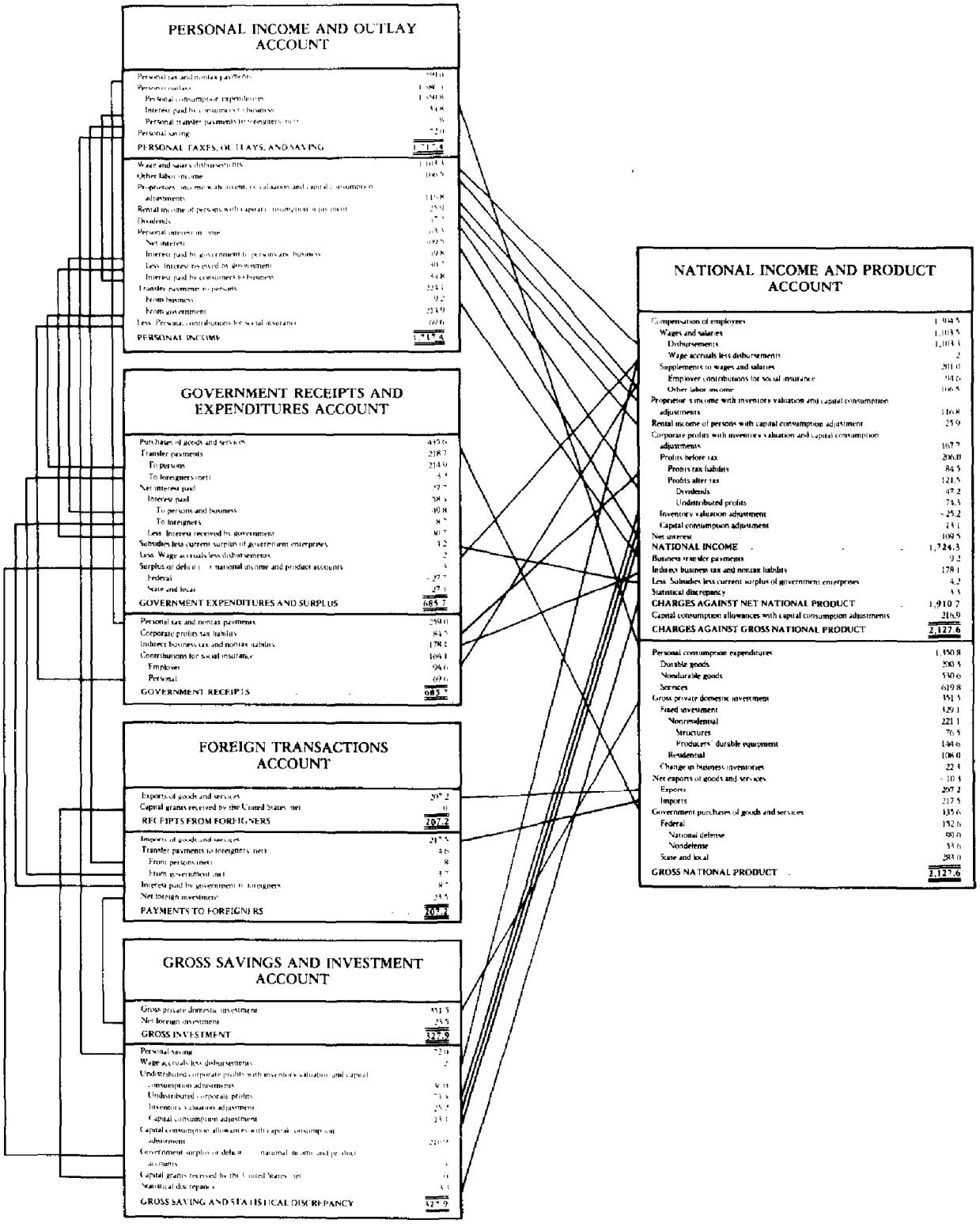
Charges against GNP, the income side of the national income and product account, is also composed of items appearing in the other four accounts. These include the basic national income components relating to employee compensation, proprietors' income, rental income of persons, corporate profits, and net interest income. Other items, which will be discussed later, are required to balance the GNP measure in the account. Definitions of national income and product components are provided in appendix I.

GNP and charges against GNP are alternative measures of the economy's gross output. GNP is the total spending of consumers, businesses, governments, and foreigners on the economy's output of finished goods and services. Charges against GNP is the sum of incomes earned during output's production plus other costs incurred during the production process.

The two measures are ways of observing the economy's output, first, as output's market value, and second, as the cost of producing output. In other words, GNP and charges against GNP are two views of the economic coin from its opposite sides. This may be better understood if the value of one item is considered. For example, the market value of an automobile registered in GNP is its retail price. The automobile's value is also registered in charges against GNP as the employees' compensation, rents, interest, profits, indirect taxes, depreciation and other economic costs of producing the automobile. The automobile's retail market value--retail price--should cover all costs incurred during its production and distribution and associated profits. Thus the automobile's retail value included in GNP should equal the incomes earned and other claims against the automobile's value that are included in charges against GNP. Applying the same reasoning

INTERRELATIONSHIP OF THE NATIONAL INCOME AND PRODUCT ACCOUNTS 1978

(BILLIONS OF DOLLARS)



to the sum of goods and services produced in the economy, the value of total product, or GNP, should equal the value of all claims against total product.

The national income and product account framework, shown on page 5, reflects the identity between total product's value and the sum of charges against its value. GNP, on the account's product side, is total product's value measured as total spending. Charges against GNP, on the income side, is the sum of all earned income and other claims against total product. Primary among these are business transfer payments, indirect business taxes, and capital consumption allowances.

The account thus presents a snapshot of the economic process of buying and selling. The incomes persons earn for selling productive services are either spent, saved, or taxed away by government. The portion spent satisfies personal wants. The portion saved is invested directly or flows through financial intermediaries and finances investment wants. The portion taxed away is spent by government to satisfy collective wants. The act of producing the goods and services to satisfy these wants, on the other hand, provides the demands for productive resources like land, labor services, and capital services. Those providing these services are remunerated in rental payments, wages and salaries, profits, and interest payments. These incomes provide the means to satisfy the personal, investment, and collective wants viewed in GNP.

The flow of economic activity captured in the account's framework is summarized in two major independent aggregates--GNP and national income. GNP is gross output in that it includes the value of capital goods depreciated during output's production. National income is the sum of earned incomes or the value of claims against GNP by those contributing to its production.

The GNP and national income estimates for 1980 measured at annual rates are about $2.6 and $2.1 trillion, respectively. The levels of the Nation's economy--GNP, national income, and constant dollar or real GNP--since 1929 are shown in appendix II.

BEA estimates the two sides of the national income and product account independently. Individual analysts estimate values for the individual product side and income side components. These estimates are then summed to obtain the totals for GNP, national income, net national product, and charges against GNP. The difference between the estimates of GNP and charges against GNP is the statistical discrepancy which is entered on the account's income side.

NATIONAL INCOME AND PRODUCT ACCOUNT FRAMEWORK

INCOME SIDE	PRODUCT SIDE
Compensation of Employees	Personal Consumption Expenditures
—Wages and salaries	—Goods
—Supplements to wages and salaries	—Services
Proprietors' Income with Inventory Valuation and Capital Consumption Adjustments	Gross Private Domestic Investment
—Farm	—Structures: residential and nonresidential
—Nonfarm	—Producers' durable equipment
Rental Income of Persons with Capital Consumption Adjustments	—Change in business inventories
	Net Exports of Goods and Services
Corporate Profits with Inventory Valuation and Capital Consumption Adjustments	—Exports
	—Imports
—Profits before tax: profits tax liability and profits after tax	Government Purchases of Goods and Services
—Inventory valuation and capital consumption adjustments	—Federal: national defense and nondefense
	—State and local
Net Interest	
NATIONAL INCOME	
Business Transfer Payments	
Indirect Business Tax and Nontax Liability	
Less: Subsidies less Current Surplus of Government Enterprises	
Statistical Discrepancy	
CHARGES AGAINST NET NATIONAL PRODUCT	
Capital Consumption Allowances with Capital Consumption Adjustment	
CHARGES AGAINST GROSS NATIONAL PRODUCT	GROSS NATIONAL PRODUCT

HOW IMPORTANT ARE THE NATIONAL INCOME AND PRODUCT ACCOUNTS?

The national income and product accounts' primary uses are to analyze the performance of the Nation's economy and provide a framework for predicting future economic activity and the impact of Federal policies. Limited use has been made of the statistics beyond that of an analytical nature. Legislative proposals introduced in the 96th Congress would have further expanded its use beyond that of an analytical tool to limiting Federal spending and triggering Federal assistance to State and local governments. Those initiatives were not enacted but point to potential uses beyond that of an analytical nature.

Executive branch uses

The accounts help Federal policymakers pursue the goals of the Employment Act of 1946--full employment, price stability, and economic growth. Federal economists use the accounts for short term fiscal, monetary, and wage-price policy analysis for managing the Nation's employment and anti-inflation goals and analyzing long term demands for skilled labor and financing for capital formation. Major Federal users include the Council of Economic Advisors, the Federal Reserve Board, the Office of Management and Budget, and the Departments of the Treasury and Commerce.

Various other Federal agencies also use the accounts in analyzing and forecasting particular areas and aspects of the Nation's economy. These include the Departments of Agriculture and Housing and Urban Development, the Department of the Interior's Bureau of Mines, and the Department of Labor's Bureau of Labor Statistics (BLS).

Although the analytical uses of the accounts are primary, additional uses are being made. The Trade Act of 1974 (P.L. 93-618) specifies the use of annual GNP estimates in determining limitations on preferential treatment extended to countries exporting goods to the United States. The GNP implicit price deflator is used as a component in the inflation adjustment factor in the Natural Gas Policy Act of 1978 (P.L. 95-621) and the Crude Oil Windfall Profit Tax Act of 1980 (P.L. 96-223) for determining the ceiling price on certain types of natural gas and the windfall profits on crude oil, respectively. The implicit price deflator--a byproduct of the GNP estimate--is a ratio of current dollar to real GNP which is discussed in chapter 6.

Congressional uses

Several congressional committees, including the Joint Economic, House Ways and Means, Senate Finance, and House and Senate Budget Committees, and the Congressional Budget Office use the accounts for evaluating the economy's performance, analyzing fiscal policy impacts, and analyzing the impact of proposed legislation.

Proposed legislation in the 96th Congress would have further extended the use of GNP beyond that of an analytic tool and could have generated concern about what it represents and how well it does so. Federal spending would have been affected by the definition and accuracy of GNP.

One proposed amendment to the Employment Act of 1946, H.R. 2314, would have limited Federal outlays in the President's Budget to equal the Council of Economic Advisor's estimated Federal receipts. The receipts would have been based on real economic growth using real GNP estimates as part of the formula for the calculation.

Another proposed bill, H.R. 4610, would have limited Federal outlays to a specific percentage of GNP for the last complete calendar year occurring before the beginning of the fiscal year. Fiscal year 1982 spending, for instance, would have been limited to 23 percent of calendar year 1980's GNP.

Lastly, H.R. 7112 proposed an antirecession assistance program for aid to State and local governments to be triggered by two consecutive quarterly declines in real GNP and real wages and salaries. Allocation of funds to States and local governments were to be based in part on the aggregate real wages and salaries component.

Private sector uses

In addition to the Federal uses, GNP data are widely used in various economic and business research and analysis activities in the private sector. The business community uses are largely for investment and marketing decisionmaking. Non-Federal users include State and local governments, businesses, professional and labor organizations, academicians, and economic forecasting and research organizations.

National income and product account components are equally important

Although GNP is the most widely known of BEA's national income and product statistics, no one national income and product account output or income measure can be singled out in terms of its importance to policymakers and other users of the data. While GNP may indicate to users changes in overall economic activity, the component measures like personal consumption expenditures, producers' durable equipment, Federal government spending, or corporate profits will indicate changes within the economy's sectors that give rise to changes in gross output and earnings. In addition, measures like producers' durable equipment and the change in business inventories may also reflect shifts in business expectations of future economic activity.

Gross domestic product is becoming an increasingly important output measure

In addition to the various national income and product estimates noted above, BEA prepares estimates of gross domestic product. Gross domestic product, as distinct from GNP, is the market value of goods and services produced by labor and property located in the United States. This measure excludes rest-of-the-world production, that is, incomes originating outside the United States to its residents' net-of-income payments to foreigners.

Due to the rapid growth of the rest-of-the-world sector in recent years, gross domestic product is becoming more widely accepted in the United States as an economic indicator. It is already the primary output measure used by most other countries which have been characterized by a larger rest-of-the-world sector than has the United States economy.

THE DEPARTMENT OF COMMERCE'S ROLE IN MEASURING NATIONAL ECONOMIC ACTIVITY

The Department of Commerce compiles the national economic accounts and estimates the Nation's GNP and related measures on an ongoing basis under the authority of the Department of Commerce Act (15 U.S.C. 171, 175, and 1516). The Act stipulates that the Secretary of Commerce shall control the gathering and distributing of statistical information relating to commerce. It also provides that the Secretary may call upon other Federal agencies for statistical data and may collate, arrange, and publish such data as he sees fit.

The Department of Commerce first became involved in national income measurement in response to a Senate resolution of the 72nd Congress in 1932. The resolution provided for estimates of the origin and distribution of the national income for the years 1929, 1930, and 1931. These data were to satisfy information needs for developing Federal fiscal policies and economic legislation.

The first estimates of GNP were prepared by the Commerce Department during World War II. These estimates were useful for determining the allocation of the Nation's resources to support the war effort and for evaluating the related inflationary impact. The framework of thinking represented by GNP provided a tool for assessing the economy's productive capacity and provided a means for determining how much production of consumer goods, war goods, and basic supplies was feasible. The Department's GNP and national income estimates were also used to analyze the impact of war production on the demand for goods and services and prices.

GNP and national income were first incorporated into the national income and product accounts in 1947. Since that time the Department has revised and refined the accounts.

The Department of Commerce's economic statistics analysis and related activities are handled by BEA. Under the policy direction and general supervision of the Department of Commerce's Chief Economist, BEA is divided into four broad areas including the national economic accounts, national analysis and projections, regional economics, and international economics. The preparation, development, and analysis of the national income and product accounts is the responsibility of the National Income and Wealth Division within the national economic accounts area.

GNP's true cost is not reflected in BEA's budget. In fiscal year 1980, BEA was appropriated $15.6 million and 472 permanent positions. The National Income and Wealth Division was funded $2.3 million and 76 permanent positions for that fiscal year for its national income and product accounts activities. However, since the accounts depend upon the output of many statistical collection activities in the Federal government, the Division's budget data do not reflect the accounts' true annual cost. In fact, most of the data are collected for other purposes; the accounts are a relatively inexpensive byproduct. If all of the data used to estimate the accounts were collected solely for that purpose, the accounts' cost would probably be in the hundreds of millions of dollars.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives were to (1) provide the Congress and the public a basic understanding of the GNP and related measures, their data sources, and how they are compiled, (2) identify issues concerning the development and reporting of GNP, and (3) act as a catalyst to focus attention on matters requiring further study.

Our effort was limited to the national income and product accounts with specific emphasis on the GNP. We did not consider other economic accounts or other activities of BEA during this effort except insofar as they concerned the national income and product accounts.

Information presented in this study was obtained through interviews with officials of BEA, the Bureau of the Census, and the Office of Federal Statistical Policy and Standards, Department of Commerce; the Council of Economic Advisors; the Federal Reserve Board; the Treasury Department; and BLS, Department of Labor. Information was also obtained from relevant studies evaluating the accounts and their data base and other national accounting literature and documents. Especially important studies recommending improvements to the accounts were the Report of the Advisory Committee on Gross National Product Data Improvement (1977) and the Report of the National Accounts Review Committee of the National Bureau of Economic Research (1957).

CHAPTER 2

NATIONAL INCOME AND PRODUCT

THEORY AND ESTIMATION CYCLE

Measuring the Nation's economic output is a massive undertaking because of the economy's complexity and the many data sources BEA uses to compile the measure. The usefulness and limitations of national income and product data are better appreciated after what will be measured and how it can be measured are defined. This chapter discusses how BEA measures the Nation's output through its estimation and revision process and identifies the varying data sources used for the initial and revised GNP and related estimates.

DEFINING THE NATION'S ECONOMIC OUTPUT

The Nation's output measured as national income and product provides a gauge of the economy's performance and can be interpreted as a yardstick of the country's material well-being. GNP summarizes the Nation's annual output of final goods and services at their market value on the product side of the account as the sum of personal consumption expenditures, gross private domestic investment, government purchases of goods and services, and net exports. On the income side of the account, charges against GNP summarizes the value of total claims against output. National income measures the income earnings of resources used to produce output as the sum of employees' compensation, proprietors' income, rental income, corporate profits, and net interest.

Deciding what to include and what to exclude from an output measure requires distinguishing between economic and noneconomic production. The criterion for this distinction generally is whether an activity is to be reflected in the market place, either as an input to or as the final sale itself. Dishes washed by a domestic servant involve a market transaction and therefore are included in economic output whereas dishes washed by a household member are excluded.

Exceptions to the market rule exist. BEA believes that certain items must be included in GNP because their exclusion would distort the measure of productive activity. These items include imputations 1/ for the rental value of owner-occupied houses, food and fuel produced and consumed on farms, and services rendered without charge by financial intermediaries, such as free banking services.

1/Process of developing estimates for missing or incomplete data.

Several other distinctions for measuring the Nation's output exist in addition to the distinction between economic and non-economic production. Total output should include only those market transactions which represent final output, current year's output, and actual value added.

In measuring national output, final products are distinguished from intermediate products. Final products are defined as those products which once purchased are not resold except as used goods. Intermediate products are defined as goods purchased for resale or for inclusion into the final product. The value of intermediate products like the flour sold to bakeries and the steel sold to automobile manufacturers are included in the bakers' and automobile manufacturers' production costs and thus are included in the market prices of bread and automobiles. If the values of such intermediate products sold by the flour and steel mills are included in the Nation's output, they will be double counted, once at the intermediate stage and once again in final output. To avoid this problem of double counting, national income estimators value only final products. Intermediate products are included in national output only where they represent inventory investment. In the example noted above, the change from the prior year in steel inventories carried by the automobile manufacturer from the previous year would be counted in that year's current output.

In measuring national output a distinction is also made between transactions involving current production and transactions involving previous years' output. The value of a used car, for example, is excluded from the measurement, but the seller's markup is counted. This distinction is made because used cars and other used goods were part of some previous year's output where the products were initially marketed and counted.

A final distinction made in defining national output is that between transactions concerning actual production or valued added and those which involve strictly paper transactions. The value of financial transactions such as the ownership transfer of stocks and bonds do not represent production and thus are excluded from output. However, the cost to persons and government of transferring financial assets, that is, the commissions paid by the consumer is included in the output measure.

OUTPUT'S DOLLAR VALUE IS MEASURED

The Nation's output can conceivably be measured by either counting the volume or the dollar value of the volume of goods and services produced during the year. The dollar value approach is the accepted approach because counting the total number of dissimilar goods and services produced using the volume approach would yield a figure with no useful meaning. Furthermore, since the value approach takes into account the relative market value of different products, the problem of weighting different products' relative value in a volume index is avoided.

The value approach has problems associated with its use, however, specifically during periods of changing prices. During such periods a dollar output measure registers both production and price changes. To isolate changes in real output, the market value measure is converted to a constant dollar or real output measure by removing the impact of price changes. The accuracy of the price measures used, primarily components of BLS' consumer price index (CPI) and producer price index (PPI), will therefore be reflected in the real output measure or real GNP.

The value of the Nation's output is measured in two ways which conceptually should result in the same dollar value figure. In practice, however, they do not. The two approaches are (1) expenditures on final product and (2) incomes earned. BEA uses both in measuring output. The expenditure and income approaches are used to estimate product side and income side measures, respectively, in the national income and product account framework as shown on page 5.

The expenditure approach provides a relatively timely means to arrive at estimates of quarterly and annual national output. For the product side expenditures on final products and changes in inventories are summed to obtain GNP. This is feasible since finished products' prices include materials' and intermediate goods' costs and value added during production. The sum of expenditures on final products therefore provides a measure for the portion of total output sold. The value of the portion of output not sold to final users, that is, the change in business inventories, is added to or subtracted from final sales to obtain gross output. GNP thus equals final sales plus inventory change.

The income approach is taken to arrive at quarterly and annual charges against GNP on the income side of the national income and product account. National income and other related charges against GNP are measured as totals of income and non-income charges against output incurred during production. Since the sum of unit production costs and profits are theoretically equal to a product's price and since GNP is conceptually the market value of final products, it follows that the sum of incomes earned during production and other charges incurred during production which are reflected in product prices should equal GNP. Using the income approach the incomes accruing to the owners of resources used in production as wages and salaries, rents, interest, and profits are summed to obtain national income.

Other charges against production that do not represent earned income, which are reflected in product prices, are included on the income side to arrive at charges against GNP. Indirect business taxes and business transfer payments are charges against output which are reflected in product prices but do not represent income of productive resources. These are added to national income to arrive at charges against net

national product. Capital consumption allowances are amortized nonincome production costs that are reflected in product prices. They are adjusted to replacement value and added to charges against net national product to arrive at charges against GNP. Subsidies, on the other hand, are deducted because they are regarded as payments to elicit productive services and hence are included in earned incomes, while the subsidized products are included in output measured as final demand at market value.

Statistical discrepancy

Using the expenditure and income approaches to estimate GNP results in two partially independent figures which differ, even though in theory the two should be equal. In practice the two approaches do not yield the same results because the data sources are different and subject to error. This difference is shown on the income side of the national income and product account framework as the statistical discrepancy, as shown on page 5. The discrepancy measures the excess of product or income. It has no meaning as an output measure but has been used to a limited degree as a measure of error as discussed in chapter 3.

FREQUENCY OF NATIONAL OUTPUT ESTIMATES AND REVISIONS

BEA produces quarterly and annual GNP, national income, and related national income and product account estimates. The quarterly estimates are computed at an annual rate to make them comparable to previous annual estimates by showing what the year's estimate would be if the remaining three quarters had the same level of activity as the quarter being measured. At the end of the calendar year, annual estimates are prepared by averaging the quarterly estimates for the year. In preparing the estimates, BEA does more than simply gather data. The estimating process which involves the use of judgment is discussed in chapter 6.

Any single preliminary quarterly or annual GNP figure is subject to at least seven revisions. Revisions are necessary to incorporate subsequently available and revised source data and changes in definitions and methodologies.

Preliminary estimates of GNP and related account components, except for national income, are first prepared for each calendar quarter about 2 weeks (15 days) after the quarter's end. Approximately 6 weeks (45 days) after the quarter the preliminary estimates are revised, incorporating firmer data from monthly and quarterly source data series. At the time of this first revision, quarterly national income estimates are initially prepared. Another revision of the quarterly estimates is done around 10 weeks (75 days) after the quarter with the exception of the fourth quarter of each year. The reason for this exception is the source data used to estimate corporate profits is available a month later than for the first three quarters.

After the calendar year, in mid-January, the revised (75-day) estimates for each of the first three quarters and the preliminary (15-day) estimate for the year's final quarter are averaged to obtain the preliminary annual estimate. This annual estimate is revised twice during the following 2 months at the same time as the final quarter's 45-day revision in mid-February and again in mid-March at the same time as the final quarter's 75-day revision. During this period the only previous year's quarterly estimate to be revised is that for the fourth quarter.

The first full set of detailed estimates for the calendar year are published in July following the reference year. The data are presented formally in the national income and product accounts' format. Also in July the year's quarterly estimates are again revised. The calendar year's annual estimates are subsequently revised two more times during July of the following 2 years. The year's quarterly estimates are again revised twice more at the same time as the two annual revisions. With preparation of the 5-year benchmark estimates from Census' quinquennial economic censuses, the annual and quarterly estimates for the calendar years since the last benchmark year are revised and are revised again for the last time with the next benchmarking. The chart on the following page illustrates the timing of the quarterly and annual estimates and revisions.

WHAT DATA SOURCES ARE USED TO MEASURE THE ECONOMY'S HEALTH?

The national income and product account is constructed from numerous general, administrative, and regulatory statistical series collected by Federal agencies and private organizations. The specific data programs used to estimate the product and income sides differ for the differently timed quarterly and annual estimates.

Product side of the national income and product account

The product side of the national income and product account is based on a variety of data reflecting changes in the value of final sales and business inventory holdings of goods and services. Although several Federal agencies and private organizations provide data for the quarterly GNP estimates, the Census Bureau is the major single data source. Census data on manufacturers, retail and wholesale trade, construction, foreign merchandise trade, and State and local governments can comprise up to 60 percent or more of the dollar value of quarterly GNP as shown on the table on page 16.

The revised quarterly and first annual estimates of GNP are derived mainly from the same statistical programs and source agencies as the preliminary estimates. These later estimates, however, employ data based on survey responses that are more complete than the advance release of the survey data used to prepare the preliminary estimates.

NATIONAL INCOME AND PRODUCT ACCOUNT REVISION SEQUENCE

	REFERENCE QUARTER QUARTERLY ESTIMATES	REFERENCE YEAR ANNUAL ESTIMATES
Monthly and Quarterly Available Source Data and Revisions	Preliminary 15-Day Estimates Revised 45-Day Estimates Revised 75-Day Estimates Revised w/1st Formal Estimate	Preliminary Mid-January Revised Mid-February Revised Mid-March 1st Formal July Estimates
Annually Available Source Data and Revisions	Revised w/2nd Formal Estimates Revised w/3rd Formal Estimates	2nd Formal July Estimates 3rd Formal July Estimates
Economic Censuses Annual Source Data	Revised w/Benchmark Revision	Benchmark Revision

NATIONAL INCOME AND PRODUCT ACCOUNT
PRODUCT SIDE – PRIMARY DATA SOURCES

Component	Percent of GNP (a) (b)	Quarterly and 1st Annual Sources	2nd and 3rd Annual Sources
Personal Consumption Expenditures	63.4		
Motor Vehicle and Parts	4.9	Motor Vehicle Manufacturers Association/ R.L. Polk & Co.	Motor Vehicle Manufacturers Association/ R.L. Polk & Co.
Gasoline and Oil	2.5	Ethyl Corp./BLS	Ethyl Corp./BLS
Other Goods	28.8	Census	Census
Housing Services	9.8	BEA	Census
Electricity	1.3	Edison Electric Institute	Edison Electric Institute/Census
Natural Gas	.7	American Gas Association	American Gas Association
Telephone	1.0	Federal Communications Commission	American Telephone and Telegraph Co.
Private Hospitals & Sanitariums	2.6	American Hospital Association	American Hospital Association/ Department of Health and Human Services
Other Services	13.5	Census/BEA/BLS/Regulatory agencies	Internal Revenue Service Department of Health and Human Services/Department of Education/BEA/BLS/Census/ Securities and Exchange Commission/ Department of Transportation/ Regulatory agencies
Gross Private Domestic Investment	16.4		
Fixed Investment	15.8		
Nonresidential	10.7		
Structures	3.8		
Buildings, utilities & farm	3.2	Census	Census
Oil and gas well drilling and exploration	.8	American Petroleum Institute	American Petroleum Institute
Other	.1	American Telephone and Telegraph Co./ Interstate Commerce Commission/ Federal Power Commission	American Telephone and Telegraph Co. Interstate Commerce Commission/ Federal Power Commission
Producers Durable Equipment	6.9		
Motor Vehicles	2.0	Motor Vehicle Manufacturers Association/ R.L. Polk & Co.	Motor Vehicle Manufacturers Association/ R.L. Polk & Co.
Aircraft	.1	Census	Census
Other	4.7	Census/BEA	Census/BEA
Residential Structures	5.1	Census/National Conference of States on Building Codes and Standards	Census/National Conference of States on Building Codes and Standards
Change in Business Inventories	.6		
Nonfarm	.8		
Manufacturing and Trade	.5	Census/Department of Energy	Census/Department of Energy
Other	.1	FTC/Department of Energy	Internal Revenue Service/Department of Energy
Farm	-.8	Department of Agriculture	Department of Agriculture
Net Exports of Goods and Services	-.3		
Exports	10.9		
Merchandise	7.0	Census	Census
Other	2.9	BEA	BEA
Imports	10.4		
Merchandise	8.4	Census	Census
Other	1.9	BEA	BEA
Government Purchases of Goods & Services	20.5		
Federal	7.3	Treasury Department/Defense Department/ Office of Personnel Management	Federal Budget/Office of Personnel Management
State and Local	13.2		
Compensation of employees	7.2	BLS	Census
Structures	1.8	Census	Census
Medical vendor payments	.8	Department of Health and Human Services	Department of Health and Human Services
Other	3.3	BEA	Census
GROSS NATIONAL PRODUCT	100.0		

Note a – 1978 fourth quarter GNP estimates.
b – Total and subtotals may not add due to rounding.

BEA's second and third revised annual GNP estimates are based upon more detailed data obtained from the Census Bureau, Internal Revenue Service and other Federal agencies. These include annual survey data on retail trade, manufacturers, housing, and detailed expenditures and receipts of State and local governments and administrative data on professional services, medical services, and regulated industries.

The GNP benchmark estimates, which serve as a reference point for other estimates because they are constructed with the firmest data, are based primarily on BEA's quinquennial input-output table. This table is produced from the Census Bureau's economic censuses data and from various data used to compile the nonbenchmark annual estimates. The input-output table provides Census-based commodity flow estimates of personal consumption expenditures and of the producers' durable equipment component of gross private domestic investment. Benchmark estimates for the remaining components of gross domestic investment, net exports, and government purchases are based on a more indepth analysis of data used for the annual estimates and the introduction of previously unavailable source data adjustments.

Income side of the national income and product account

BLS, the Federal Trade Commission (FTC),and the Department of Agriculture are the major data sources for estimating the income side of the quarterly national income and product account as shown on the table on the following page. BEA's quarterly national income estimates incorporate data from BLS' 790 program on employment and earnings to estimate private and State and local government wages and salaries, the FTC's Quarterly Financial Report to estimate corporate profits, and the Department of Agriculture's farm income data. Other national income quarterly sources include Department of Defense data, used to estimate military compensation, and Office of Personnel Management data, used to estimate Federal civilian payrolls.

The remaining income components are based on data from several sources. Nonfarm proprietors' income is estimated using monthly indicators of activity in each major industry. To estimate employer contributions to social insurance, the appropriate tax rate for each major program is applied to the corresponding monthly wage and salary aggregate. Other labor income is computed using contribution rates applied to monthly employment data. Appropriate tax rates for major programs are applied to corresponding monthly sales estimates for indirect business taxes. Subsidies are based on various budget documents. Net interest is based on movements in interest rates and estimated levels of business borrowing and personal saving. The inventory valuation adjustment is based on the monthly PPI. Business transfer payments, rental income, and capital consumption allowances with capital consumption adjustments are based on past trends.

NATIONAL INCOME AND PRODUCT ACCOUNT
INCOME SIDE – PRIMARY DATA SOURCES

Component	Percent of GNP (a) (b)	Quarterly Sources	1st Annual Sources	2nd and 3rd Annual Sources
Compensation of Employees	61.4			
Wages and Salaries	51.9			
Federal	3.6	Office of Personnel Management/ Defense Department	Federal Budget	Federal Budget
State and Local	6.4	BLS	Census/BLS	Census/BLS
Other	41.9	BLS/Department of Agriculture	BLS/Department of Agriculture	BLS/Interstate Commerce Commission Department of Agriculture
Supplements to Wages and Salaries	9.5			
Employer Contribution for Social Insurance	4.4	BEA	Department of Health and Human Services / Various Federal Agencies	Department of Health and Human Services
Old Age Survivors Disability, and Hospital Insurance	2.4			
State Unemployment Insurance	.6			
Federal Civilian Employment Retirement	.3			
State & Local Employees Retirement	.8			
Other	.3			
Other Labor Income	5.0	Various Federal agencies and private organizations	Various Federal agencies and private organizations	Internal Revenue Service/ Various Federal agencies/ private organizations
Proprietors' Income with Inventory Valuation and Capital Consumption Adjustments	5.5			
Farm	(c)	Department of Agriculture	Department of Agriculture	Department of Agriculture
Nonfarm	(c)	BEA	BEA	Internal Revenue Service
Rental Income of Persons with Capital Consumption Adjustments	1.1			
Rental Income	(c)	BEA	BEA/Census/Department of Agriculture	BEA/Census/Department of Agriculture
Capital Consumption Adjustments	(c)			Internal Revenue Service
Corporate Profits with inventory valuation and Capital Consumption Adjustments	8.0	FTC (d)/Federal Reserve Board/ Comptroller of Currency/Federal Deposit Insurance Corporation/BEA/ Department of Energy/ Public Sources	Public and trade source	Internal Revenue Service
Net Interest	5.0	BEA	Various Federal Agencies	Internal Revenue Service/ Various Federal Agencies
NATIONAL INCOME	81.0			
Business Transfer Payments	.5	BEA	BEA	Internal Revenue Service
Indirect Business Tax and Nontax Liability	8.2	Treasury/State	Federal Budget/Treasury/Census	Federal Budget/Internal Revenue Service/Treasury/Census
Less: Subsidies less current surplus of Government Enterprises	– .2	Treasury/Postal Service/Department of Agriculture/Commodity Credit Corporation	Federal Budget/Treasury/Commodity Credit Corporation/Census	Federal Budget/Treasury/Commodity Credit Corporation/Census
Statistical Discrepancy	.2			
CHARGES AGAINST NET NATIONAL PRODUCT	89.8			
Capital Consumption Allowances with Capital Consumption Adjustment	10.2	BEA	Department of Agriculture/BEA	Internal Revenue Service/Department of Agriculture/BEA
CHARGES AGAINST GROSS NATIONAL PRODUCT	100.0			

Note: a – 1978 fourth quarter GNP estimates.
b – Total and subtotal may not add due to rounding.
c – Detailed data not available.
d – FTC corporate profit data–quarterly financial reports–not available to prepare preliminary estimates.

The first formal annual estimates of national income, since data from annual surveys are not yet available, rely on some of the same data sources as the quarterly estimates but include some new data sources. These include wage and salary data from BLS' 202 program, the Department of Health and Human Services' data on employers' social insurance contributions, public and trade source data on corporate profits, and Census' data on State and local government payrolls. Additional data sources also include more recent Department of Agriculture estimates of farm income and financial regulatory agencies' reports on net interest.

The second and third annual revised estimates of national income incorporate data from the Internal Revenue Service's Statistics of Income program. BEA uses this information from a sample of tax returns to revise the annual estimates of corporate profits, interest income, proprietors' income, and rental income. New data from the Annual Housing Survey used for the rental income estimates and various data on employers' contributions for health and life insurance for estimating supplements to wages and salaries also become available. Revised annual estimates of the items reconciling national income to GNP are derived from the Internal Revenue Service's income data, the Treasury and Agriculture Departments, the Federal Budget, and Census's surveys of State and local governments.

In addition to several new data sources, many of the same data sources from which the annual income measures are estimated are used to benchmark the income side of the account. Data used in the benchmark year estimates, however, are more complete and fully analyzed than when the annual estimates were first compiled. The new data sources include the Decennial Census of Housing used for the rental income estimates, Internal Revenue Service data for corporate profits and unreported business income, BEA survey data on income from foreign investment, and the quinquennial Census of Governments data on indirect business taxes and government employee compensation.

DISSEMINATING THE DATA TO ITS USERS

The national income and product accounts data, notably GNP, are made available to users through several Department of Commerce and BEA vehicles. The most widely circulated, Commerce's monthly "Survey of Current Business," provides preliminary and revised quarterly estimates of GNP and national income and their major components. This publication, with a 15,000 monthly circulation, also provides (1) tables detailing monthly data for each of the economy's sectors, (2) the formal annual accounts published every July for the most recent and three previous years, (3) current and constant dollar estimates of GNP and national income, and (4) other national economic measures including their subcomponents.

In addition to the monthly Commerce publication, GNP estimates are made available through earlier BEA releases of the data. About 1,000 GNP press releases, widely quoted by the news media, are

distributed monthly. About 100 public and private users who want the data as soon as possible subscribe to BEA's national income and product account mailgram service, and another 100 major users in government and the private sector receive copies of the detailed account tables from BEA when the estimates are released.

National income and product data are also reproduced in the Joint Economic Committee's "Economic Indicators," the "Federal Reserve Bulletin," and Commerce's "Business Conditions Digest." Numerous private concerns also reproduce these data. Most important are economic consulting firms that provide data bank services such as Data Resources Inc., Chase Econometrics, Wharton EFA, and Townsend-Greenspan Inc.

ISSUES FOR CONSIDERATION

Our work on the national income and product accounts surfaced several broad issues. While these issues should be considered, they should not be construed to be all-inclusive. The issues that we have developed and present in the following chapters are:

--How important are accurate and reliable national income and product estimates, how accurate are they, how accurate can they be, and how accurate should they be?

--Are the accounts' source data reliable, complete, and timely, and are source data improvement efforts adequate and needed?

--How and to what extent do BEA's estimation procedures affect the accounts' accuracy?

--Are the accounts' concepts, classifications, and frequency adequate for present-day uses?

Chapters 3 and 4 address the first issue while chapters 5, 6, and 7 address the remaining issues, respectively.

CHAPTER 3

GNP'S ACCURACY IS UNCERTAIN AND THE LEVEL NEEDED UNDETERMINED

The national income and product accounts, and in particular GNP, given its important economic policymaking uses, should be reasonably accurate and consistent in representing national output and income levels and changes. BEA contends that for short term policymaking uses accurate and consistent quarter-to-quarter changes are more important than an accurate level of GNP. Due to the lack of precise error measures, how well the accounts do this, however, is uncertain. Although BEA attempts to assess the reliability of its estimates by examining past revisions, economic policymakers do not know how accurate current national income and product estimates are and therefore risk proposing inappropriate policies. Nevertheless, due to political influences, differing economic theories, and other economic data which may enter into policy decisionmaking, the impacts of policy errors resulting solely from inaccurate national income and product estimates are difficult to identify.

METHODS USED IN DETERMINING GNP ACCURACY

The problem of judging the accuracy of national income and product measures has persisted for as long as the Commerce Department has been preparing estimates of the Nation's income and output. In 1933 Simon Kuznets, who prepared the initial 1929-32 Department of Commerce national income estimates, noted that the estimates were deficient because the measure's different constituent parts were liable to errors of differing character which were therefore not comparable or addable. BEA officials have reaffirmed that error measures cannot be provided for a good reason--the total error in the underlying source data cannot be measured. Nevertheless, attempts have been and are being made by BEA and others to assess GNP's accuracy by analyzing the revisions, evaluating the statistical discrepancy, and using expert judgement.

BEA analyzes quarter-to-quarter changes in the GNP for provisional (the preliminary and first revised estimates which are subject to further revision) and later revised estimates. BEA publishes this information in its GNP press release. The GNP revision record is published to provide guidelines for assessing the likely size of the current quarterly estimates' revision. BEA's analysis shows that from 1964 to 1978 the average revision, disregarding plus and minus signs, in quarter-to-quarter percent changes in GNP and real GNP at annual rates from the preliminary to first July estimates was 1 percentage point. However, this method, rather than indicating the amount of error in the estimates, indicates only the probable size of future revisions to the early estimates. The following table shows the amount of the revisions and quarter-to-quarter percent changes for the preliminary and first July quarterly GNP estimates for the years 1977

through 1979. For the 3-year period, the average revision in quarter-to-quarter percent changes from the preliminary to the first July estimates was 0.8 of a percentage point. The limitations of analyzing the revisions as a means of assessing GNP reliability will be further examined in the following chapter.

REVISIONS AND QUARTER-TO-QUARTER PERCENT CHANGES IN PRELIMINARY AND FIRST JULY QUARTERLY GNP ESTIMATES 1977-1979

Year/ Quarter	Preliminary Estimate	First July Estimate	Amount of Revision	Percent change in GNP from previous quarter	
	billions			Preliminary	First July
1977 I	$1,792.5	$1,806.8	$ 14.3		
II	1,869.0	1,867.0	- 2.0	4.3	3.3
III	1,911.3	1,916.8	5.5	2.3	2.7
IV	1,965.1	1,958.1	- 7.0	2.8	2.1
1978 I	1,992.9	2,011.3	18.4	1.4	2.7
II	2,076.9	2,104.2	27.3	4.2	4.6
III	2,141.1	2,159.6	18.5	3.0	2.6
IV	2,210.8	2,235.2	24.4	3.2	3.5
1979 I	2,265.6	2,340.6	75.0	2.4	4.7
II	2,327.2	2,374.6	47.4	2.7	1.4
III	2,391.5	2,444.1	52.6	2.7	2.9
IV	2,455.8	2,496.3	40.5	2.6	2.1

Source: **Estimates of preliminary and first July GNP from Survey of Current Business**

The size of the statistical discrepancy resulting from estimating GNP as total expenditures and gross income is also used to evaluate possible error in the estimates. A smaller discrepancy suggests that less error is contained in the various component estimates than a larger discrepancy. However, a small discrepancy may also result from offsetting errors in both sides of the national income and product account. Since the same source data is used in parts on both sides of the account and since BEA's efforts to contain the discrepancy may result in added estimation errors, it is an imperfect error measure. The following table shows a comparison of the 45-day and first July quarterly estimates' statistical discrepancies for the years 1977 through 1979.

COMPARISON OF THE STATISTICAL DISCREPANCIES FOR 45-DAY AND FIRST JULY QUARTERLY GNP ESTIMATES 1977-1979

Year/ Quarter	45-day Statistical Discrepancy Amount (billions)	45-day Statistical Discrepancy Percent of GNP	First July Statistical Discrepancy Amount (billions)	First July Statistical Discrepancy Percent of GNP
1977 I	$9.2	.51	$3.4	.19
II	-0.7	-.04	3.7	.20
III	2.2	.11	7.1	.37
IV	-3.6	-.18	4.8	.24
1978 I	-6.7	-.34	3.0	.15
II	0.9	.04	2.3	.11
III	3.0	.14	3.9	.18
IV	3.9	.18	4.1	.18
1979 I	2.1	.09	5.8	.25
II	-0.5	-.02	0.7	.03
III	7.9	.33	2.8	.11
IV	4.0	.16	-0.7	-.02

Source: Amounts of statistical discrepancies from Survey of Current Business

GNP accuracy can also be assessed by using expert judgment in evaluating the measure's data sources and methodology. Knowledge of source data quality and the methods used provide a basis for judging the relative strengths and weaknesses of the individual components of GNP. Four data traits generally used in judging the individual components are:

--Straightforward data responses, like the value of a store's sales, are more likely to be accurate than those requiring respondent calculations, like average monthly electric power cost.

--Reported data is more reliable when respondent recordkeeping is adequate, that is, when data collection procedures are consistent and complete.

--Total universe data are more accurate than sample survey data, and large samples provide more accurate data than small samples.

--Estimates that require adjusting source data to conform to national income and product definitions, like business inventories, may be less accurate than components based on data not requiring such adjustments.

Applying the four data traits in a given analysis always involves subjective judgment; therefore, any assessment, even an expert one, may be incorrect. The data traits are used to provide guidance, not hard and fast rules. In addition, the lack of an

up-to-date handbook on data sources and methodology has hampered the use of judgment in evaluating GNP. Evaluations using these four data traits have been used to varying degrees by those whose studies we cite in the following chapters. They use this method coupled with an examination of the revisions and statistical discrepancy, rather than using an assessment based strictly on expert judgement.

INACCURATE GNP ESTIMATES HAVE OVERSTATED AND UNDERSTATED ECONOMIC ACTIVITY

Although a 1 percentage point average revision in quarterly changes in GNP expressed at annual rates may give the appearance of overall reliability, from the late 1940s through 1977 revised quarterly national income and product estimates showed the provisional estimates could have adversely affected appraisals of the economy's performance on eight occasions. Preliminary GNP estimates overstated the severity of the recessions of 1948-49, 1953-54, and 1957-58. Preliminary and first revised GNP estimates for 1965 understated the strength of the economy's expansion during that year. Preliminary and first revised estimates of the corporate profits component of national income for 1969-70 understated the impact of the 1969-70 recession on business incomes. Preliminary and revised quarterly GNP estimates for the second and third quarters of 1971 overstated the economy's recovery from the 1969-70 recession. The 1973 changes in nonfarm inventories and farm income estimates were understated and therefore understated the seriousness of the coming recession. Lastly, GNP estimates for 1975-76 understated the economy's expansion as measured by later revised estimates.

Causes of inaccurate estimates

The causes of these inaccurate provisional national income and product estimates can in most instances be traced to source data problems. Available information indicates this to have been the case for the revisions that occurred for 1965 and afterwards and highly likely to have been the principal reason for the revisions prior to 1965.

The upward revision of the 1965 GNP estimates which had understated the economy's expansion was the result of two influences, according to a BEA official. First was the incorporation of upwardly revised Census estimates of business investment spending and the change in business inventories coupled with better data on State and local government purchases. Second, the August 1965 benchmarking of the estimates changed the weights for the various detailed components in such a way as to have an upward influence on GNP.

The 1971 downward revision ($7 billion for 1969 and $5.9 billion for 1970) of the corporate profits component of national income for 1969 and 1970 arose, according to BEA officials, because BEA lacked adequate information to adjust early reported

corporate book profits to an estimate of taxable corporate income. The initial estimates were based on corporate book profits reported to shareholders. The revised estimates were based on Internal Revenue Service tabulations of taxable corporate income. BEA's provisional estimates were made assuming that the taxable income measure and the book profit measure, after certain adjustments, would show fairly parallel movements, as they previously had. However, in 1969 the two measures diverged, reported book profits increasing and taxable income declining. The early book profits data thus misled BEA's estimators.

The 1972 downward revision of GNP for the second and third quarters of 1971 ($3.1 and $7.4 billion) resulted from Census revising estimates for key source data programs, according to BEA. Census had developed new estimates of construction activity, retail sales, and retail inventories. These data all indicated less expansion in the economy than the earlier Census estimates used in compiling GNP.

BEA's 1974 upward revision of nonfarm inventories for the fourth quarter of 1973 ($6.5 billion) and first quarter of 1974 ($6.6 billion) was due mainly to the revision of data on nonfarm inventories. Census data on manufacturing and trade inventories reported at book value were revised for the third month of the quarter and made available after the 45-day GNP estimates were introduced. In addition, BEA introduced an adjustment for a bias between the monthly manufacturing and retail trade inventory series and annual surveys that become available later. The adjustment was subsequently justified and is now made on a current basis and should not cause further problems.

The understatement of 1973 farm income ($8.8 billion) resulted from the lack of current data on farmers' expenses. The estimates of farm income which are trended from annual level projections and historical relationships failed to reflect conditions that occurred in 1973.

The 1977 upward revision of 1975 and 1976 GNP ($12.5 and $14.9 billion) was due to Census revising data pertaining to personal expenditures on services, nonresidential construction, producers' durable equipment, and inventories.

Examples of the effects of misleading estimates on users

Relatively large revisions to preliminary GNP estimates appearing during critical phases in the business cycle, when economic policy options are being planned and implemented, can mislead assessments of the economy's performance and therefore mislead policy decisions. According to Council of Economic Advisors officials, who use the preliminary estimates, this occurred as a result of estimates released for 1965 and 1973-74. On the other hand, Federal Reserve officials said they have not been affected by GNP revisions.

The growth of real GNP for midyear 1965 as reported late in that year indicated the economy to be growing at a 5.5 percent annual rate. Later estimates for the same period showed the economy to be growing at an 8 percent annual rate. Arthur Okun, a member of the Council of Economic Advisors during the period, later complained that had the growth of GNP been more precisely reported, the Johnson Administration would have foreseen the inflationary impact of the escalating defense expenditures and proposed a tax increase earlier than it had. 1/ Such a tax increase if enacted, accordingly, might have curtailed total spending in the economy sufficiently to have contributed to a noninflationary economic policy at the time.

Arthur Burns, a former Council Chairman, also acknowledged the difficulties the faulty 1965 GNP data created for Federal policymakers. He, like Okun, claimed that the erroneous data had understated the economy's inflationary propensity. 2/

Inaccurate estimates of the change in business inventories component of GNP during 1973 and 1974 also misled Federal policymakers' assessment of the economy. Alan Greenspan, also a former Council Chairman, claimed that the preliminary inventory data failed to indicate the nature of the 1974-75 recession. 3/ According to another Council official, the revised inventory data for the period which was released in July 1974 resulted in the Council changing its economic forecast and policy recommendations "overnight." As a result, he said the Council is now cautious about acting on any single release of the estimates.

Federal Reserve Board officials claim not to have been affected in their policies by large revisions. Since they independently analyze much of the same information that enters into GNP, they anticipate GNP changes. As a normal practice, if the GNP estimates do not look as anticipated they wait for more information before making policy decisions. They and other major Federal users of the estimates we contacted expressed no overall dissatisfaction with the estimates' accuracy.

1/Arthur M. Okun, The Political Economy of Prosperity (Washington, D.C.: The Brookings Institution, 1970), pp. 68-69.

2/Arthur F. Burns and Paul A. Samuelson, Full Employment Guideposts and Economic Stability (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1967), p. 34.

3/Alan Greenspan, oral remarks, Conference on Income and Wealth, National Bureau of Economic Research, Washington, D.C., 4 May, 1979.

Inaccurate national income and product estimates may affect the Nation's economy. Due to the number and complexity of economic and political factors which affect economic policy decisions and the economy, it is difficult to determine how inaccurate estimates may affect the level of output, incomes, employment, and prices in the economy. Nevertheless, the impact of inaccurate and misleading data can, in general, be outlined. Data which misleads economic policies and business decisions can exact costs in terms of idle or misallocated resources.

HOW MUCH ACCURACY IS NEEDED?

GNP cannot be measured exactly. The estimates should, within reason, accurately represent the trend of and turning points in economic activity to avoid the chance of misleading economic policies. The estimates should accurately represent changes in the structure of the economic process which give rise to changes in the economy's output and income. However, how precise these data can be or must be to be adequate for economic policymaking uses is uncertain.

Department of Commerce guidelines for the release of economic indicators state that revised data should be presented so that average differences between preliminary and revised figures are small relative to average changes in the series. How this policy might apply to the GNP estimates is not specified. However, summary measures for the quarterly GNP estimates for 1977 through 1979 presented on page 22 show

--an absolute average difference, disregarding plus and minus signs, between the quarter-to-quarter percent change in GNP measured by the preliminary and first July estimates of 0.8 of a percentage point,

--an average quarter-to-quarter change in GNP measured by the first July estimates of 3.0 percent, and

--the absolute average difference of 0.8 to be about 27 percent of the average quarterly change of 3.0 percent in the first July estimates.

The timing and intensity of economic fluctuations affects the associated data needs of policymakers for accurate national income and product data. Studies questioning accuracy and reliability which are the focus of the following chapter presented conflicting views of the estimates' overall reliability in the past. One of the analysts claims that maintaining past error rates in future estimates will not be sufficient for future analysis and policymaking needs.

CHAPTER 4

STUDIES DIFFER ON GNP'S RELIABILITY FOR POLICYMAKING USES

Because of the lack of precise error measures, alternative means have been used to evaluate the reliability of current quarterly GNP estimates. The primary means used to assess the estimates' reliability include examining the revisions and judging the quality of the source data from which the GNP components are compiled. According to national accounts experts, neither of the methods used alone provide a complete assessment of the estimates' reliability, but in combination the methods provide an overall view. This chapter will focus on the major studies of GNP revisions and the following will consider source data quality.

Three major studies, 1/ using mostly the 45-day and later revised GNP estimates, present conflicting views of the estimates' overall reliability. Two studies found the current estimates adequate for economic policy decisionmaking while the third found the estimates unreliable enough that they could have misled policymakers throughout the 1947-61 period. The periods covered by these studies range from 1947 through 1961 and 1971. No subsequent major examinations of the revisions have been performed.

REVISIONS TO GNP ESTIMATES PROVIDE PARTIAL INSIGHT INTO ERROR

Part of the error contained in BEA's initial GNP estimates is removed through the revision process. BEA's estimation procedures include revising the GNP estimates as more complete data become available after the estimates are initially released. This procedure permits incorporating source data presumed more accurate than previously available data into the GNP time series. The revised estimates thus should be more accurate than the initial estimates. Furthermore, the difference between the initial and the revised estimates should provide a measure of the amount of error contained in the initial estimates. However, since the revised estimates may also contain error, the amount of the revision is only a partial error measure.

1/George Jaszi, "The Quarterly National Income and Product Accounts of the United States, 1942-62," in Studies in Short-Term National Accounts and Long-Term Economic Growth, ed. Simon Goldberg and Phyllis Deane, Income and Wealth, 11 (New Haven: International Association for Research in Income and Wealth, 1965) pp. 100-187. Allan H. Young, Reliability of the Quarterly National Income and Product Accounts of the United States, 1947-71, U.S. Department of Commerce, Bureau of Economic Analysis Staff Paper No. 23 (Washington, D.C.: National Technical Information Service, July 1974); Rosanne Cole, Errors in Provisional Estimates of Gross National Product (New York: National Bureau of Economic Research, 1969).

Summary statistical measures of the amount of the revision between initial and revised GNP estimates over a period of several years indicate the average and the range of revision that can be expected in the current estimates and may identify particular components needing improvement. These measures used alone, however, will not indicate the extent of error contained in any single release of current GNP estimates. Furthermore, since the measures are summary figures, they tend to give the appearance of accuracy over periods of relative economic stability when it is easier to predict changes in incomplete source data series used in the early estimates. The three studies discussed below each used such summary statistical measures in their evaluations.

EXAMINATIONS OF THE REVISIONS PRESENT CONFLICTING VIEWS

The three major studies judged the reliability of the national income and product data, and GNP in particular, primarily by comparing early released estimates to later revised estimates. 1/ Two of the studies' authors are associated with BEA. George Jaszi and Allan Young performed their studies while with BEA and are its current director and deputy director. Rosanne Cole performed her study with the National Bureau of Economic Research, a nongovernmental research organization, and is now with International Business Machines. More recently she served as a member on the Advisory Committee on GNP Data Improvement which we discuss in chapter 5.

In analyzing different estimates for similar periods, the three evaluators differed in their conclusions on the accuracy of the data for policy users. Jaszi and Young found the estimates to be adequate for economic analysis and policymaking uses while Cole concluded that the preliminary and 45-day revised GNP figures were erroneous enough that they could have misled economists using GNP as an indicator of the severity of contractions and the strength of expansions in the economy. She further concluded that the estimates, when used for economic forecasting, impaired the accuracy of the forecasts. Young did acknowledge the need for improved estimates for future uses which if not brought about would hamper policymaking and economic theory improvements. The three evaluators did agree that error in the GNP estimates has been reduced over the years since 1947, the initial data period used in their studies.

1/The error measures cited from these studies are not directly comparable to BEA's analysis of the revisions noted on page 21. Aside from the different time frames and the differently timed estimates analyzed, the 1 percentage point on page 21 refers to the average revision of quarterly changes in GNP while the 11 and 35 percent measures noted in Jaszi's study and those noted in Young's analysis are average revisions of quarterly changes taken as a percent of the average quarterly change measured by the revised estimates.

George Jaszi compared the 1947-61 quarterly changes in the 45-day national income and product estimates with the latest available revised estimates in his 1963 study of the quarterly estimates. He computed overall summary measures of quarterly percent changes in GNP, national income, and their components. Jaszi found the 45-day estimates understated the quarter-to-quarter change in GNP as measured by the revised estimates by 11 percent. The average absolute error, that is, regardless of positive or negative sign, was 35 percent of the absolute change in the later estimates. In addition, he found that 8 percent of the total number of directional changes, that is, from an increase to decrease or vice versa, in quarterly GNP differed for the 45-day series compared to the revised estimates.

Allan Young analyzed the GNP revisions in 1974 for the period 1947-71 and also looked at the subperiods 1947-63 and 1964-71. Young used basically the same method as Jaszi. His analysis of the earlier period 1947-63 used the 1958 benchmark estimates that were released in 1965 which were not available at the time of Jaszi's study as the basis for comparing the quarterly changes. For the 1947-63 period, he found the 45-day GNP estimates understated the average quarterly change in GNP in the latest estimates by 15 percent. He measured absolute average error in the early estimates as 43 percent of the absolute change in the latest estimates, and he found 12 percent relative directional misses between the series.

Young found the estimates for the 1964-71 period improved considerably. He found the 45-day estimates of quarterly GNP change understated the latest available estimates by 8 percent and the absolute average error in the 45-day estimates as 13 percent of the absolute average change in the revised estimates. He found no directional misses. However, the 1964-71 period was a period of relative economic stability compared to the 1947-63 period, thereby making the estimation process for the period easier.

Young's analysis of the GNP subcomponents for 1964-71 found several subject to large revisions. He found the 45-day estimates of quarterly change to either understate or overstate later estimates. On the product side, large changes included nonresidential structures (-26 percent), residential structures (-17 percent), producers' durable equipment (+12 percent), and nondefense Federal expenditures (-23 percent). On the income side, the earlier estimates of unincorporated business and professional income (-37 percent), farm income (+59 percent), rental income of persons (-39 percent), and corporate profits (+43 percent) were indicated as being the most erroneous.

Rosanne Cole's 1969 analysis focused primarily on the 45-day GNP and related major components for the 1947-61 period. Although she considered the same period as Jaszi and analyzed the same estimates as Young for 1947-63, her error measures cannot be directly compared to those of the two earlier studies. Her basis for comparing 45-day and revised GNP estimates was the 1958

benchmark estimates released in 1965 which were not available when Jaszi did his study; the benchmark data was used by Young. Furthermore, her techniques for measuring error used the dollar amount of revisions and quarterly changes rather than the quarterly percent changes used by Jaszi and Young.

For the 1947-61 period Cole found that the 45-day GNP estimates understated the latest available estimates by an average of $600 million. She measured the absolute average error in the 45-day GNP estimates at $3.2 billion.

Cole also found that:

--BEA's preliminary GNP and major component estimates were considerably more accurate than forecast estimates for the same period from the private sector.

--The revision process was effective in reducing errors contained in initial estimates, and error in the initial estimates had reduced over time.

--Preliminary and 45-day estimates understated the extent of expansions in the economy and overstated the extent of contractions throughout the period examined.

--Estimates of the value of nondurable goods, producers' durable equipment, new construction, change in business inventories, Federal spending, and net exports were the most erroneous GNP components.

In summary, the three major studies present conflicting views of the GNP estimates' overall reliability and differ in their conclusions on the accuracy of the data for policy users. The three evaluators do agree that error in the GNP estimates has been reduced over the years covered by their studies and one noted that there remains a need for improved estimates for future uses.

CHAPTER 5

RECOMMENDATIONS OF THE ADVISORY COMMITTEE ON GNP DATA IMPROVEMENT: DO THE BENEFITS JUSTIFY THE COST?

The accuracy and reliability of the national income and product estimates are affected by the quality of the data with which they are compiled and the procedures used to estimate the components. A recent evaluation of the underlying data base performed by independent national accounts experts found many areas in need of improvement and recommended many changes. However, implementation of the improvements recommended in the experts' 1977 report has fallen behind schedule. It also appears that the need for the improvements in terms of improved economic decisionmaking ability has not been adequately demonstrated.

ADVISORY COMMITTEE FORMED TO EVALUATE UNDERLYING GNP SOURCE DATA

Motivated by substantial revisions to GNP estimates in the early 1970s, the Statistical Policy Division of the Office of Management and Budget--the predecessor to the Office of Federal Statistical Policy and Standards, 1/ Department of Commerce--established an advisory committee in 1973 to evaluate the quality and timeliness of the underlying data used to prepare the national economic accounts and to recommend improvements to the data. The Advisory Committee on GNP Data Improvement's official assignment was to focus on the statistical shortcomings of the GNP estimates, the most widely known measure of the economic accounts.

The advisory committee was formed because the Statistical Policy Division wanted an outside evaluation of data problems which were the most pressing along with feasible solutions. This was the first such comprehensive study of the underlying data used to estimate the accounts. The last outside review of the national economic accounts by an advisory committee was made in 1957 by the National Accounts Review Committee, which we discuss in chapter 7. That committee concentrated on the conceptual issues of the accounts.

1/The Office of Federal Statistical Policy and Standards is the general statistical coordination agency of the U.S. Government. Its work consists of planning priorities for the statistical system's development, facilitating efficient methods for meeting data users' needs, reducing burdens imposed on respondents, and acting as a liaison among the various Federal statistical agencies. The Paperwork Reduction Act of 1980 (P.L. 96-511) transferred the Office's functions to the newly created Office of Information and Regulatory Affairs within the Office of Management and Budget effective April 1, 1981.

Six nongovernmental national accounts experts were selected as committee members. Included were Daniel Creamer of the Conference Board, Rosanne Cole of International Business Machines whom we noted in chapter 4 as conducting a study of the revisions, Edward Denison of the Brookings Institution (now with BEA), Raymond Goldsmith of the National Bureau of Economic Research, Alan Greenspan of Townsend-Greenspan Inc., and John Kendrick of George Washington University. The committee also had a working staff of four.

The advisory committee's evaluation of the source data base used to compile the estimates appears to be a broad and detailed study of the reliability and coverage of the data. The committee looked at the complete data base used for estimating GNP and its individual subcomponents.

The advisory committee's study and subsequent report 1/ in 1977 focused primarily on the data needs for the quarterly, annual, and 5-year benchmark, and constant dollar GNP estimates. The committee recommended about 150 data improvements to more than 20 Federal agencies to be implemented over a 6-year period at an estimated cost of roughly $25 million in 1976 prices. The total cost was based on very elementary estimating techniques, including considerable reliance on rules of thumb. To allow for underestimation, the cost estimates were increased by 50 percent to arrive at the $25 million. The objective of the recommendations was to improve the accuracy and timeliness of the national income and product estimates by improving the underlying data at a reasonable cost.

FINDINGS AND RECOMMENDATIONS OF THE ADVISORY COMMITTEE ON GNP DATA IMPROVEMENT

The advisory committee's findings and recommendations address problems involving the coverage and detail of specific areas of economic activity provided by source data programs and the accuracy and timely provision of the data. Other recommendations regard the frequency at which BEA provides its estimates and accompanying documentation of estimation procedures and reliability analysis. The recommendations generally pertain to the data used to estimate quarterly and annual GNP and national income and the quinquennial input-output table used in benchmarking the estimates. Improvements to data sources from which farm sector, rest-of-the-world (exports and imports), and constant dollar estimates are prepared were recommended separately, but nevertheless those data are used to compile the quarterly, annual, and benchmark estimates. The table on the following page shows the number of recommended improvements by type, estimates affected, and status.

1/U.S. Department of Commerce, Gross National Product Data Improvement Project Report (Washington, D.C.: GPO, 1977).

SCHEDULE OF THE ADVISORY COMMITTEE ON GNP DATA IMPROVEMENT'S

RECOMMENDATIONS BY TYPE, ESTIMATES AFFECTED, AND STATUS a/

ESTIMATES AFFECTED	TOTAL	ACCURACY	COVERAGE/ DETAIL	TIMELINESS	METHODOLOGY/ DOCUMENTATION	FREQUENCY
Quarterly Nonfarm						
Total	41	14	13	11	1	2
Not Implemented	23	9	8	6	0	0
Implemented	12	4	4	1	1	2
Partially Implemented	6	1	1	4	0	0
Annual Nonfarm						
Total	22	2	12	5	3	0
Not Implemented	20	2	11	5	2	0
Implemented	1	0	0	0	1	0
Partially Implemented	1	0	1	0	0	0
Benchmark						
Total	38	2	30	1	5	0
Not Implemented	26	2	19	1	4	0
Implemented	10	0	10	0	0	0
Partially Implemented	2	0	1	0	1	0
Farm						
Total	19	1	15	3	0	0
Not Implemented	16	0	14	2	0	0
Implemented	3	1	1	1	0	0
Partially Implemented	0	0	0	0	0	0
Constant Dollar						
Total	21	3	12	2	4	0
Not Implemented	13	3	7	1	2	0
Implemented	6	0	3	1	2	0
Partially Implemented	2	0	2	0	0	0
Rest-of-the-World						
Total	14	5	9	0	0	0
Not Implemented	14	5	9	0	0	0
Implemented	0	0	0	0	0	0
Partially Implemented	0	0	0	0	0	0
Total b/						
Recommendations	155	27	91	22	13	2
Not Implemented	112	21	68	15	8	0
Implemented	32	5	18	3	4	2
Partially Implemented	11	1	5	4	1	0

a/Based on GAO's analysis of the committee's recommendations and information provided by the Office of Federal Statistical Policy and Standards as of February 1980.

b/Does not include 11 recommendations made on the Federal Reserve Board's flow-of-funds accounts.

Quarterly nonfarm data

BEA's 15-day and 45-day quarterly estimates of current and constant dollar GNP, current dollar national income, and their component estimates are the most important of the national accounts data for short term Federal macroeconomic fiscal and monetary policymaking uses. Based on its evaluation of the data underlying these estimates, the committee recommended 41 improvements. Fourteen would improve the data programs' accuracy, 13 their coverage and detail, and 11 the timeliness that the data are available. Major programs found problematic include Census' surveys of monthly retail trade, selected services receipts, and manufacturers' shipments, inventories, and orders; BEA's plant and equipment survey; and BLS' 790 program. If implemented, the recommendations directed at these and other statistical programs are expected to improve the accuracy of the quarterly estimates.

Examples of problems the committee identified with the nonfarm monthly and quarterly surveys were:

--Census' Monthly Retail Trade Survey failed to produce consistently accurate initial estimates of the level and change in retail sales and estimates of retail inventories.

--Census' Monthly Selected Services Receipts Survey failed to provide reliable initial estimates of consumer services and did not adequately cover private education services.

--Census' Survey of Manufacturers' Shipments, Inventories, and Orders deficiencies reflected the lack of a full probability sample for small firms and inadequate reporting of defense orders.

--BEA's Plant and Equipment Survey problems included the lack of a full probability and updated sample.

--BLS' 790 survey of company-reported payrolls and employment had poor response rates, lack of sample updating, and inadequate processing of survey data.

Annual nonfarm data

Since BEA's annual estimates are used as control totals for estimating the quarterly figures, improving the coverage, accuracy, and timeliness of annual source data would also improve the quarterly estimates. The advisory committee recommended 22 improvements to data programs used for the annual estimates. It recommended 12 coverage and detail, 5 timeliness, and 2 accuracy improvements to annual data. Major programs affected by these recommendations include Census' surveys of retail trade, wholesale trade, manufacturers, State and local governments, and a proposed survey of nonprofit organizations; BLS' 202 program; and a proposed FTC survey of annual corporate profits.

Examples of weaknesses the committee found with the annual nonfarm data were:

--Data from Census' Annual Retail Trade Survey, Wholesale Trade Survey, and Government Finances program and BLS' 202 program were not being provided in time for the first annual estimates.

--Data from Census' Annual Survey of Manufacturers were not provided in adequate detail by industry for annual updating and determining the distribution of goods in the input-output table.

--Existing data on income and expenditures of nonprofit organizations were limited in coverage and detail; therefore, a Census annual survey of these organizations was proposed.

--Existing data on corporate profits are inadequate and not timely; therefore, an FTC annual survey of corporate profits was proposed.

Benchmark data

Since the current quarterly and annual estimates are extrapolated from the benchmarks which for major GNP components are derived from the input-output table, improving the 5-year benchmark estimates would also improve the accuracy of the current GNP estimates. The advisory committee recommended 38 improvements to input-output and benchmark data. Thirty of the improvements relate to coverage problems, 5 to methodology and documentation, and 2 to accuracy. These recommendations are largely directed at the Census' economic censuses which are conducted every 5 years. Improving the quality and timeliness of the data coming from these programs should improve the quality and timeliness of the input-output table and likewise the benchmarks. The censuses cover manufacturers, retail trade, wholesale trade, services, construction, transportation, governments, and mining and materials.

To provide more detailed measures of economic activity in the benchmark years, the committee recommendations included expanding the coverage of the censuses to include all activity in each census field. It also recommended that the Census conduct censuses of the real estate industry and nonprofit organizations to further expand the coverage of economic activity.

Farm, constant dollar, and rest-of-the-world data

In addition to the many data sources used to compile the nonfarm domestic economy output and income measures, the advisory committee separately examined data sources relating to the farm sector, prices, and exports and imports. The committee recommended 19 improvements to farm data, mostly involving the coverage of Department of Agriculture's statistical programs on farm output

and income. The committee found that the farm programs inadequately covered the agricultural sector for GNP use, particularly quarterly measures of income from crop and livestock operations. The committee further recommended 21 improvements to the constant dollar estimates' source data programs, mostly coverage, primarily affecting BLS' CPI and PPI programs and Census construction prices. The price indexes, while found generally good, need to be expanded to fill gaps and, in some instances, redefined to be consistent with the GNP subcomponents. It recommended 14 improvements concerning exports and imports, mostly affecting the coverage of Census and BEA data programs on merchandise trade, transport, and travel. The committee found data programs covering merchandise exports, travel, and transport suffering from poor response and inadequate coverage.

HAVE THE ADVISORY COMMITTEE'S RECOMMENDATIONS BEEN ADEQUATELY CONSIDERED AND IMPLEMENTED BY THE AFFECTED AGENCIES?

Implementation of the 1977 Advisory Committee on GNP Data Improvement's recommendations has not proceeded as planned. The committee, working with the agencies, developed a 6-year program for implementing the recommended improvements. The latest available data, as of February 1980, show that 32 recommendations have been implemented and 11 partially implemented. Although current updated information is not available, an Office of Federal Statistical Policy and Standards official told us that few changes have been made since February 1980. Eighteen of the 56 improvements scheduled to be implemented during 1978 and 1979 had been implemented. Several additional improvements directed at 1977 economic censuses were implemented before the commission's work was completed. The number and February 1980 status of the recommended improvements by agency are shown on the following page.

The committee's recommendations are directed mostly at the Federal agencies responsible for collecting the data. The Federal agencies' acceptance of the recommendations is strictly at their discretion; however, implementing many of the improvements is subject to the budget process. Implementation of the recommendations is being coordinated by the Department of Commerce's Office of Federal Statistical Policy and Standards.

Acceptance and implementation of the improvements to the statistical programs do not hinge on any one factor. Cost, response burden, and feasibility of implementation are prime factors. Statistical improvements which can be easily implemented, impose little or no additional burden on respondents, and incur minimal budget increases are readily being implemented. For those not meeting these conditions, the additional funding requirements compete with other higher priority demands on the Federal budget. This results in more stringent tests in justifying the data improvements for which the benefits are difficult to quantify. For example, improvements for Census' economic

NUMBER AND STATUS OF THE ADVISORY COMMITTEE ON GNP DATA

IMPROVEMENT'S RECOMMENDATIONS BY FEDERAL AGENCIES

Federal Agencies	Number	Status	
		Implemented	Partially implemented
Department of Commerce			
Census Bureau	65	13	2
Bureau of Economic Analysis	27	8	1
Office of Federal Statistical Policy and Standards	5	1	
Industry and Trade Administration	1		
Department of Defense	4		
Department of Labor			
Bureau of Labor Statistics	11	1	2
Other	2		1
Department of the Treasury			
Internal Revenue Service	6		1
Comptroller of the Currency	2		1
Other	3		
Department of Agriculture			
Economics and Statistics Service	18	3	
Department of Health and Human Services	5	2	1
Interstate Commerce Commission	2		
Federal Reserve Board	4	1	1
Federal Home Loan Bank Board	1	1	
Office of Management and Budget	1	1	
Federal Energy Administration	1		
Federal Power Commission	1	1	
Federal Trade Commission	3		
Securities and Exchange Commission	1		
Federal Deposit Insurance Corporation	2	—	1
Total Federal Agencies	165	32	11
National Bureau of Economic Research a/	1		
TOTAL b/	166		

a/Non-governmental private research organization.
b/Includes recommendations for the Federal Reserve Board's flow-of-funds statement.

surveys slated for fiscal year 1980 were declined funding by the Congress due to (1) Census' inability to show the improvements to be realized and (2) the already high cost of the 1980 census. The Congress also rejected funding the data improvements which were included in Census' fiscal year 1981 funding request. Additionally, several other Federal agencies have cited increased burden on respondents as the reason for rejecting the recommended improvements.

ARE THE GNP DATA IMPROVEMENTS REALLY NEEDED?

Determining whether or not the advisory committee's recommendations should be supported and implemented hinges on assessing the relative benefits and costs of implementing them. The total costs of implementing the improvements are presently unknown and the benefits which could be realized are uncertain. With an awareness of GNP's policymaking importance, the advisory committee considered the benefits of implementing the recommendations to have a high payoff relative to their cost. BEA, the producer of the estimates, and major Federal users of the data, especially the Council of Economic Advisors and the Federal Reserve Board, generally feel that the improvements would produce more accurate estimates and should be implemented. On the other hand, data source agencies vary in their willingness to increase statistical budget requests and to additionally burden respondents; therefore, some may prefer not to implement the recommended improvements.

Benefits which could result from implementing the recommendations appear to be plentiful. More accurate source data with improved coverage and provided in a more timely manner to BEA would improve the accuracy of the GNP estimates and should aid economic and business analysis and decisionmaking. The improvements should also add to the quality of the individual statistical programs and thus benefit all users of the data series. The benefits from implementing the recommendations would thus spill over to improve the quality of a large part of the output of the Federal statistical system.

The qualitative nature of the committee's recommended improvements makes the benefits received difficult to measure. A dollar value is not readily apparent for improved understanding of the economy or better economic and business decisionmaking.

The costs of implementing the recommendations would be easier to estimate than the benefits. Even though the $25 million cited in the committee's report is a rough estimate of cost to improve the data, firmer cost data can be obtained. Respondents likewise can reasonably determine the dollar cost of answering statistical inquiries.

Problems similar to those encountered in assessing the benefits and costs of implementing the recommendations are encountered in assessing the effects of not implementing the

recommendations. Since several variables may enter into policy and decisionmaking, it is difficult to assess how using less than the best statistical information will affect policies and decisions. Equally difficult is the task of valuing output and income losses due to inadequate information.

CHAPTER 6

IMPACT OF BEA'S METHODS ON THE ACCURACY OF NATIONAL INCOME AND PRODUCT DATA IS UNCERTAIN

While inaccuracies and gaps in the source data affect national income and product data's accuracy, procedures used by BEA may also have an impact. However, how much and to what extent the procedures affect accuracy is uncertain. BEA states that its methods are selected to minimize error and are deemed to be the most satisfactory based on past experience, knowledge of the data, and consistency of results. These methods include procedures to (1) benchmark the data every 5 years, (2) measure quarterly and annual changes during the intervening and subsequent years, (3) estimate the individual components, (4) seasonally adjust the quarterly measures, and (5) provide constant dollar GNP estimates. The judgment of BEA officials also enters into the estimation process and may influence the estimates.

With the lack of a complete and up-to-date handbook of methods (the last such publication was in 1954), detailed information on BEA's present estimating methodology is not readily accessible to users. The Advisory Committee on GNP Data Improvement recognized this as an overriding need and recommended the preparation and publication of a new handbook detailing concepts, sources of data, estimating methodology, and their limitations. Although BEA has described its estimation methods in the 1954 publication and in various subsequent "Survey of Current Business" articles and staff papers, these efforts apparently do not satisfy user needs. The advisory committee cited users' frustration on the need to know the actual procedures. BEA is currently working on the updated handbook which it expects to complete in 1982.

BENCHMARKING AND THE QUARTERLY AND ANNUAL ESTIMATION PROCESS

The GNP, national income, and related component benchmark measurements are the result of efforts to actually measure the level of the Nation's income and product every 5 years. Current quarterly and annual estimates are extrapolated or projected on the basis of current information beyond the benchmark measures. The later revised estimates are interpolated or inferred on the basis of information from mostly the same data sources between two benchmark measures.

Benchmark measurements

The GNP, national income, and related component benchmark measurements are built up from voluminous statistical information pertaining to the value of economic production. Benchmark measures for the major GNP components of personal consumption

expenditures and producers' durable equipment are derived from the quinquennial input-output table. The table is based on detailed production data provided by the economic censuses which are conducted every 5 years. The benchmark measures for other GNP and national income components are valued from various source data.

The input-output table is a matrix in which the flow of output is traced through intermediate production stages until it is tranformed into finished producer and consumer commodities. For each industry the disposition of output to intermediate use and final demand is tabulated. Since GNP is total final demand, the input-output table provides a suitable means for deriving the value of the Nation's output of final goods and services.

The method used in preparing the input-output table is called the commodity flow method. It is the most sophisticated and complex means of measuring gross industry output. Measuring output using this method requires detailed information from suppliers, manufacturers, wholesalers, and retailers on the cost of goods purchased for resale and the total cost of resources employed in output's production and distribution. This information is used to provide an analysis of the distribution of each industry's output among other industries and final consumers and producers.

The input-output analysis provides benchmark totals for the detailed GNP components of personal consumption expenditures and producers' durable goods purchased. These estimates are also used to establish the weights for the detailed categories of personal consumption expenditures and producers' durable equipment which are maintained from one benchmark to the next. The accuracy of the benchmarks, therefore, will affect the accuracy of all quarterly and annual estimates for subsequent and intervening nonbenchmark years.

Other GNP components, construction expenditures, government purchases, and net exports, are benchmarked directly from the input-output table but do not utilize commodity-flow techniques, except for the detailed breakdown. These components are valued using data from the economic censuses and sources used for quarterly and annual estimates.

Benchmark estimates for charges against GNP, the income side of the national income and product account components, are not derived from the quinquennial input-output table; they are valued from the same data sources used for the annual estimates. This procedure of estimating the two sides as independently as possible permits the statistical discrepancy to be derived as a residual which signals possible estimation errors.

Quarterly and annual estimation process

Quarterly and annual estimates of GNP, national income and their components are prepared as changes over time from and between the benchmark levels. Current levels of quarterly and annual GNP and national income are extrapolated from the most recent benchmark level. Quarterly and annual levels for years between established benchmark years are interpolated. These methods, used in conjunction with BEA's revision procedures are used to develop the continuously updated national income and product time series.

How BEA develops its quarterly and annual national income and product estimates can be explained by an example of how a GNP time series might be developed. Assuming that benchmark estimates exist for 1947 through 1977 for years ending in the numbers 2 or 7, this set of seven benchmark estimates can be used as a base for estimating quarterly and annual GNP for the period 1947 through the most recent year and quarter. The estimates for the years and the quarters between the benchmarks will be interpolations of the benchmarks while estimates for the years after 1977 will be extrapolations of the 1977 benchmark.

Available information from monthly, quarterly and annual statistical series that reflect consumer purchases of goods and services, construction, producers' purchases of equipment, government purchases of goods and services, and exports and imports of goods and services would be appropriate for estimating the annual and quarterly GNP. However, since this information would be less detailed and complete than that used to prepare the benchmark estimates, rather than use it to determine GNP's level, it would be used to determine annual and quarter-to-quarter percent changes from the seven established benchmark estimates. The annual changes between any two benchmark years and the quarterly changes between two annual estimates would be interpolated using information on economic activity during the particular years and quarters. The annual changes since the most recent benchmark estimate, 1977, and the quarterly changes since the most recent annual estimate would be extrapolated using appropriate available information. This example in very summary fashion describes how BEA produces its national income and product account time series.

BEA does not estimate quarterly and annual GNP, national income, or other related components in aggregate form as the above example may suggest. Various data are used to extrapolate or interpolate changes in the detailed subcomponents of these measures. For example, Census retail trade data is the extrapolator for retail sales of various consumer goods which are a component of personal consumption expenditures. The component estimates are summed to obtain GNP and related totals.

BEA's process of benchmarking every 5 years and interpolating and extrapolating during the intervening and subsequent years produces a time series reflecting business cycle

fluctuations. A disadvantage of the process, however, is that errors made in the benchmarks will be interpolated and extrapolated to the other years' estimates. Errors made in preparing the annual estimates will be interpolated or extrapolated to the quarterly estimates.

ESTIMATING AND ADJUSTING THE NATIONAL INCOME AND PRODUCT COMPONENTS

Extrapolation, interpolation, and revision characterize the process used to prepare the national income and product time series. Preparing the particular quarterly and annual estimates, however, involves many procedures for estimating the various subcomponents' extrapolators or interpolators. Adjustments are also made to remove seasonal and price impacts from the data. The procedures used in estimating the various components, especially the quarterly estimates, are described in detail in the "Report of the Advisory Committee on Gross National Product Data Improvement" and a BEA staff paper "Quarterly GNP Estimates Revisited in a Double Digit Inflationary Economy." These estimates are prepared using data from various sources. We listed primary sources on pages 16 and 18 of this report.

Precisely how the many procedures and adjustments used to estimate quarterly and annual GNP may affect the estimates' accuracy is uncertain. According to BEA, adjustments are made and standard procedures are not always relied on in order to improve accuracy. On the other hand, experts acknowledge that components requiring adjustments are potentially less accurate than those based directly on reported data.

Estimating the individual components

There are many detailed procedures for estimating the individual components and subcomponents which are aggregated to arrive at the total GNP and related estimates. The following examples indicate some of the procedures used.

Source data for the various subcomponents may differ in character and therefore are applied differently in the estimation process. Census retail trade data, for instance, is reported at current dollar value and likewise used. On the other hand, the extrapolator BEA uses for quarterly automobiles sales is reported in units sold and is converted to retail value by multiplying it by the average unit value of new cars. Similar to automotive sales, the extrapolator for quarterly wages and salaries is estimated using BLS' 790 program data on employment, earnings, and hours worked.

The basic data used to estimate the components may also be adjusted to (1) account for items valued by other means or (2) conform to BEA's concepts. An example of using alternative means to value items is the estimate for consumer goods. BEA uses Census retail trade data for most of the consumer goods, but values the automobile, gasoline, and oil sales' portion

using other data; therefore, their value is deducted from the Census retail trade total used to estimate the value for other consumer goods. In conforming to BEA's concepts, an example is the distinction for the distribution of automobile sales among consumers and businesses. Automobiles sold to consumers are placed in the personal consumption expenditures component and those sold to businesses are placed in the producers' durable equipment component. While the adjustments noted appear to be fairly simple, there are others that are complex and require detailed steps to be performed.

Certain nonmarket activities included in the accounts have values which cannot be directly measured as defined. Such values, like the services of owner-occupied housing, are estimated from related information. GNP includes eight imputed items which amount to roughly 9 percent of its value. The principal imputations are the rental value of owner-occupied housing, the value of food and fuel produced and consumed on farms, food furnished employees, and free services provided by financial intermediaries. Figures for the value of owner-occupied housing, for instance, are estimated with housing stock data from the Decennial Census of Housing, the Annual Housing Survey, and the CPI for residential rents.

Seasonal adjustments

Seasonal adjustment is designed to remove seasonal impacts from monthly and quarterly series to highlight business cycle changes and trends. Each quarterly GNP component is seasonally adjusted individually by using seasonally adjusted source data to estimate them. Census and BLS adjust their data series before BEA receives the data and BEA adjusts the data from its surveys as well as many other data obtained from various sources.

The Census Bureau, BLS, and BEA use the X-11 Variant of the Census Method II Seasonal Adjustment Program. The method generally involves estimating seasonal adjustment factors which are applied to monthly or quarterly data to eliminate the seasonal component of total monthly or quarterly variation in a time series. The adjustment factors which are periodically revised are based on past experience of seasonal activity in a series. They are estimated using moving averages of time series data to isolate fluctuations due to the time of the year.

BEA's analysis of seasonally adjusted quarterly GNP suggests that seasonal adjustment contributes to the error in quarterly GNP. It found the seasonal adjustment factor revisions a major contributor to the size of the GNP revisions. It concluded that since the process of seasonally adjusting data introduces error into the source data, seasonal adjustment constrains efforts to improve the national income and product estimates' reliability. Revised seasonal factors, however, are necessary to account for changing patterns in seasonal behavior.

Constant dollar estimates

A final principal adjustment made to the GNP data involves developing constant dollar or real GNP estimates. This adjustment is done to eliminate the effect of price changes on the GNP time series. During periods of inflation, or its less common opposite deflation, this adjustment is important because it removes the impact of price changes from the current dollar value measure of output.

Constant dollar GNP estimates are typically developed by dividing the subcomponents of the major GNP components by the appropriate detailed consumer or producer price indexes. For example, the furniture and household equipment category of personal consumption expenditures is deflated by the BLS' CPI for furniture and bedding. 1/ A byproduct of this process is the implicit price deflator which is derived as the ratio of current dollar to real GNP.

BEA's procedure of estimating real GNP by deflating the GNP subcomponents, as opposed to GNP in total, picks up both changes in real output and changes in output's composition. The implicit price deflators calculated for each of the subcomponents also reflect changes in spending patterns. This procedure thus results in output measures which show how the value of output would have changed over time had prices remained unchanged.

In addition to elements affecting the quality of the current dollar estimates, the constant dollar estimates are affected by the quality of the price indicators used in the deflation process. Inaccurate price measures will result in inaccurate real GNP estimates. Furthermore, the price data must account for quality changes in products which will also affect the real GNP measures. Many studies on the effects of quality changes on prices have been done, and BLS adjusts many of its detailed price series for certain types of quality change.

Besides the real GNP estimates produced by BEA, the only other current major comparable measure of change in the physical volume of output is the Federal Reserve Board's monthly index of industrial production. The index is confined to the output of factories, mines, and utilities which comprise a major portion of total output as defined by GNP. The index's current estimates are derived using physical volume of output data and electric

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1/ The rationale behind the method of deflating GNP is based on the conceptual definition of GNP as a measure of the market value of current output. The market value of GNP is the total quantity of goods and services produced times their prices. Deflating GNP to some base year's prices is to value the current quantity of output in the base year's prices. This is done by dividing current dollar GNP by a price index which measures price changes from a base period to the current period.

power inputs to industries and employee hours, both adjusted for productivity change. Similar to GNP, the index is benchmarked to the economic censuses.

While there are differences between the two measures, that is, concept and data sources, comparative analyses have been made of the movements of the two series. The comparisons, although performed on an irregular basis, have shown the two series to be generally parallel measuring change, but in a few instances there were substantial differences. As a result, the advisory committeee on GNP Data Improvement recommended that the two agencies jointly analyze the two output measures and explain the differing movements between the series publicly.

BEA OFFICIALS' JUDGMENT IN THE ESTIMATION PROCESS

Although the procedures outlined above may suggest that estimating GNP, national income, and related components simply involves plugging numbers into established formulas, judgment also enters into the estimates, especially the current estimates. Since judgment is used during the estimation process primarily to fill gaps in missing source data, considerable judgment is used in the current estimates. For instance, out of 44 key data series entering into preliminary quarterly GNP estimates, 31 of the series data for the third month of the quarter are source data projections prepared by BEA. For the second month of the quarter for the same preliminary estimates the number of projected series reduces to 10. For the first month, only 2 series are projected. The projections are made available to the public on request, and BEA officials stated that from this information judgments made by them can be determined.

Judgments made by estimators responsible for the particular GNP and related component estimates are reviewed twice during the estimation process. The National Income and Wealth Division Chief reviews the component estimates and compiles the data into the GNP and charges against GNP framework. He reviews the component and total estimates for their reasonableness, consistency, completeness, and the size of the statistical discrepancy. BEA's Director also reviews the estimates prior to their release. During these two reviews information assumptions used and judgments made are presented. However, according to BEA, the reviews rarely result in the estimates being changed.

BEA views the process of estimating current GNP as a mixture of science and art or standard procedures and judgment which should be used flexibly since the economy and available data sources are subject to change. Since the preliminary GNP, national income, and related component figures are based on incomplete and preliminary data on economic activity with judgment compensating for the data gaps, the figures, rather than being actual measurements, are truly estimates of the current situation. BEA notes this characteristic of its preliminary estimates in its GNP press release.

In addition to the use of judgment during the GNP estimation process, judgments of BEA officials are further reflected in the estimates. BEA officials are responsible for selecting the national income and product accounts' concepts and classifications and for selecting the methods and data sources used to estimate the accounts.

CHAPTER 7

UNRESOLVED ISSUES OF NATIONAL INCOME AND PRODUCT CONCEPTS, CLASSIFICATIONS, AND ESTIMATION FREQUENCY

What national income and product should measure is a subject that has been debated for some time. Controversy over how national output and income should be defined evolved with the development of national accounting and modern economic theory during the 1930s. More recently issues involving national income and product concepts have reappeared in studies of the national accounts. How much detail the accounts should provide and how often the measures should be presented also continue to be questioned.

The last broad review to look at the accounts' conceptual aspects was done in 1957 by the National Accounts Review Committee of the National Bureau of Economic Research at the request of the Office of Statistical Standards, the Office of Federal Statistical Policy and Standards' predecessor. The latest review of the accounts, that of the Advisory Committee on GNP Data Improvement, completed in 1977, as covered in chapter 5, dealt primarily with the underlying data used to produce the national income and product estimates rather than what the concepts should be.

Besides the 1957 Review Committee's study 1/, the National Bureau of Economic Research has subsequently held periodic conferences (in 1971, 1973, 1974, and 1979) which have further dealt with the issues. In addition, individual national accounts' experts have studied the issues.

Controversy over measuring national output has occurred because the experts differ on output's definition for measuring national income and product. These differences do not address the statistical accuracy of GNP as defined and measured by BEA, but rather seek to change what is being measured. National accounts experts outside of BEA are not unanimous in their support of what changes should be made. The major unresolved issues of national income and product concepts, classifications, and frequency are presented in this chapter.

1/National Accounts Review Committee of the National Bureau of Economic Research, The National Economic Accounts of the United States: Review, Appraisal, and Recommendations (Washington, D.C.: GPO, 1958).

NATIONAL ACCOUNTS REVIEW COMMITTEE CREATED TO EXAMINE AND EVALUATE THE NATIONAL ECONOMIC ACCOUNTS

The National Accounts Review Committee was established by the National Bureau of Economic Research, a nongovernmental economic research organization, at the request of the Bureau of the Budget's Office of Statistical Standards to undertake a review of the national economic accounts. The review's objective was to provide a thorough examination and evaluation of the accounts and to make recommendations for improvement, with specific emphasis on the conceptual matters that would serve Government and private users more effectively.

The review committee's 1957 study of the national economic accounts of the United States included the national income and product accounts, the international balance of payments statement, the flow-of-funds statement, the input-output table, and the national balance sheet. The committee made 29 broad recommendations to improve the national economic accounts. Twenty-one of the committee's broad recommendations directly or indirectly pertained to the national income and product accounts. Recommendations were made affecting the accounts' basic data, structure, definitions, detail, and frequency.

BEA has made major changes to the national income and product accounts as recommended by the review committee. It has simplified the accounts' structure, expanded the detail of the quarterly and annual current and constant dollar estimates, increased the estimation frequency of the constant dollar estimates, and integrated the national income and product accounts with the input-output table, the flow-of-funds statement and other economic accounts.

Although the National Accounts Review Committee's 23-year-old study was the last broad review of conceptual issues, subsequent examinations have been made of the accounts' concepts and classifications. 1/ The changes to the accounts considered in subsequent examinations are more radical than those recommended by the 1957 review committee and could, if adopted, affect the definition and use of the GNP and other national income and product components. These studies which incorporate other experts' research in national accounts are the basis of the following discussion of national income and product conceptual issues.

1/Nancy Ruggles and Richard Ruggles, The Design of Economic Accounts (New York: National Bureau of Economic Research, 1970); F. Thomas Juster, "Alternatives to GNP as a Measure of Economic Progress," in U.S. Economic Growth From 1976 to 1986: Prospects, Problems, and Patterns, 10 (Washington, D.C.: GPO, 1977), pp. 12-24.

CONCEPTUAL CHANGES COULD IMPAIR GNP AS A PRODUCTION MEASURE

The GNP has only limited usefulness in assessing real long term economic growth and economic well-being according to some national accounts experts because GNP as presently defined excludes nonmarket production, the services of household and government durable goods, and intangible investment from the accounts. The distinction presently made between intermediate and final products in the national income and product account also limits GNP's usefulness, and according to one economist the exclusion of much of the subterranean activity in the accounts' framework presumably misrepresents the measure of economic activity. Changing the accounts' scope to include these items, however, would alter the market activity character of GNP.

Nonmarket production

Some economists believe nonmarket production of households could improve GNP's usefulness. Household operation and maintenance and personal care activities performed by household members, while never recorded in market transactions, affect their physical welfare and thus according to many economists should be included in the measure of economic output. Including such nonmarket production would entail measurement problems and would impair GNP, national income, and related components as measures of activity in the Nation's product and resource markets. Since activities performed by household members do not involve market transactions and the setting of prices, the value of these activities cannot be directly measured. Including them in GNP would therefore require that their values be estimated from other related data. This added imputation in the accounts could weaken it as a measure of market activity. However, estimates of the value of nonmarket production would not affect GNP's present concept if they were presented as addendum items in the accounts which users then could add to or subtract from GNP as they see fit. BEA presently has a program underway to develop such measures.

Services of durables

Including value of services provided by consumer and government durable goods could, like nonmarket household production, improve GNP's usefulness. The value of consumer durable goods purchases is presently measured in GNP. However, since these goods yield services for years after they are purchased, many economists feel that the value of these services, beyond the original purchase price, should also be included in GNP. One example would be the services provided by a washing machine. Only the machine's purchase price is included in GNP if it is purchased by a consumer, while for a commercial laundry's purchase both the machine's purchase price and the revenues received from its use are counted in GNP. As with nonmarket production, the value of such services from household durables cannot be directly measured; they have no market value and would have to be imputed.

This imputation could impair GNP as a measure of market activity. In addition, the imputed flow of services from government capital formation, such as structures or durable equipment which provide services for years beyond the year they were purchased, is a desired addendum to GNP. It would present problems similar to measuring the services of household capital.

Intangible investments

Spending on intangible investments is another area that economists feel should be included in measures of capital formation in the accounts. Expenditures on items like education, health care, and research and development are presently represented as current production. Since these types of expenditures are similar to tangible capital investment in that they contribute to future output, some national income experts feel that they should be reclassified as capital formation and that the flow of services from such spending should be imputed to current output.

Reclassifying household, business, and government expenditures on intangible investments within the accounts should not have any overall effect on the GNP measure, but imputing the value of the flow of services from such spending to current output would alter GNP. Like other imputations the imputed flow of services from intangible investments would add another component to the accounts which would not be based directly on reported data. The added imputation could weaken GNP as a measure of activity in the Nation's marketplaces.

Furthermore, imputing the flow of services from intangibles would probably also entail estimation problems. Because the benefits from education, health care, and research and development expenditures may never be realized, determining how to value the services presents a problem. In the present accounts, the benefits of such spending are included in the output and income measures as they are realized.

Intermediate and final goods distinction

Another area of controversy involving the accounts which affects GNP as a measure of economic growth and economic well-being is the distinction between intermediate and final goods. Presently, the distinction between intermediate goods and final goods is clearly defined for business output. This distinction, however, is not made for the government and household sectors.

Many government services, rather than being supplied to final users, are supplied directly to businesses. Since these services represent inputs to business output, they are intermediate goods rather than final output. Including the services in government spending and then also including in GNP the full market value of business products, the prices of which are presumed to cover the tax cost of providing the government services, thus amounts to double counting the services value. For this reason, the

handling of government spending in the accounts has been the subject of discussion among economists since their inception. This controversy has not been resolved due to the lack of a feasible means of estimating what proportions of government spending directly benefits businesses versus that which benefits final consumers.

Some economists also feel that certain household expenditures should not be included in GNP because they are a cost of earning a living, similar to the expenses associated with operating a business. Such expenditures include transportation, clothing, and food costs associated with individuals going to work and earning a living. Although estimating these expenses should not present a difficult measurement problem, the desirability of excluding particular living costs from GNP remains questionable. For analytical purposes the total spending of households, in general, is a more useful indicator of the economy's performance than household spending less certain living costs.

Subterranean economy

Many activities occurring in what has been referred to as the subterranean economy do not enter into GNP. For the purpose of our discussion, the subterranean economy includes illegal and legal incomes which are not reported. Illegal activities include such areas as gambling, prostitution, narcotics trafficking, loan sharking, business theft, and white collar crime. Legal activities such as barter and other income that are not reported or underreported for tax purposes would also be included in the subterranean economy.

As presently defined, GNP excludes income from illegal activities but includes income from legal activities in the subterranean economy. According to BEA, illegal transactions are omitted from GNP primarily because there is no feasible method of estimating the extent of such activities. The GNP concept does include income from legal activities in the subterranean economy but all such income cannot be measured. BEA does make adjustments for underreported taxable legal income in GNP, but it does not have sufficient information to adjust for unreported legal income.

Estimates of the size of the subterranean economy vary widely. For 1976 the subterranean economy was estimated to range from $100 to $369 billion, 1/ which amounts to 6 to 21 percent of that year's GNP. For 1976 BEA roughly estimated that $6 to $10 billion--about 1/2 of 1 percent of GNP--was missed from its GNP estimates as a result of unreported legal income.

1/Peter Gutman, "Statistical Illusions, Mistaken Policies," Challenge, Nov.-Dec. 1979, pp. 14-15.

Excluding a large part of the subterranean transactions from official output and income statistics has been noted to misrepresent activity in the economy and bias economic decisionmaking. 1/ Effects of this exclusion include: overstated effective tax rate calculations; understatement of the rate of economic growth; and erroneous ratios of savings and consumption to income. These distortions are thus great enough to mislead economic policy prescriptions.

Due to the difficulty of collecting data on unreported legally and illegally earned taxable income, roundabout means must be used to estimate the size of the subterranean economy. The questionable accuracy of these estimates, like other imputed items, would increase the likelihood of error if they were included in GNP.

CLASSIFICATION CHANGES COULD IMPROVE GNP'S USEFULNESS BY PROVIDING GREATER DETAIL

Aside from changes in the accounts discussed above that would alter the GNP's conceptual definition, changes to how the data is presented could enhance the accounts' usefulness without affecting the GNP concept. However, according to BEA officials, GNP's usefulness would be improved only if accuracy were not unduly impaired. Two major changes that reviewers of the accounts have recommended involve the presentation of the value of the output of nonprofit organizations and the presentation of government spending. Both these changes in presentation would require additional data.

The accounts could be improved if services provided by nonprofit institutions were measured separately. Currently the output of nonprofit institutions providing services to households is included in the services component of personal consumption expenditures along with services provided households by the business sector. Recognizing that activity among nonprofit institutions differs from businesses in that such institutions do not operate under the profit motive, critics of the accounts claim that services provided to households by nonprofit institutions, such as hospitals, colleges and universities, unions, and trust funds, should be presented in a separate classification.

Expanding the level of detail and presentation of government purchases also would improve the accounts' usefulness. Presently, in the detailed accounts, Federal and State and local government spending is classified by type (services, structures, etc.) and function (defense, education, etc.), but information about purchases of goods and services by product group is not available on a current basis. This information, which would be useful for analyzing the impact of changes in government spending on industries, is, however, planned for future presentation.

1/Ibid., pp. 16-17.

QUALITY IMPROVEMENTS WOULD MAKE MONTHLY GNP FEASIBLE

BEA estimates GNP and national income and related components quarterly (at annual rates) and annually. BEA has been estimating monthly personal income since 1938 and recently began estimating monthly disposition of personal income including personal consumption expenditures and its deflator. Although many users would like to have GNP estimated monthly, an interagency committee of the Office of Management and Budget has determined that source data quality and timeliness are inadequate for accurate monthly GNP estimates. However, should the quality and timeliness of key data programs on construction, producers' durable equipment, inventories, foreign transactions, and government spending improve, monthly GNP, like monthly personal consumption expenditures--a major GNP component--may become feasible.

CHAPTER 8

FOCUSING ATTENTION ON GNP ISSUES

Prior efforts in addressing the issues surrounding the GNP's accuracy and reliability, methods, and concepts have brought changes to the estimates. Most notable are the efforts of the Advisory Committee on GNP Data Improvement and of the National Accounts Review Committee. Nevertheless, issues and problems concerning the estimates still exist. Our study identifies several broad issues and some specific concerns with the GNP estimates centering on the accuracy and reliability of the estimates and the methods and concepts used. We hope that this study will act as a catalyst to focus attention on matters requiring further study.

The current state of the economy demands that Federal policymakers, those in the Congress as well as the executive branch, have reasonably accurate data on which to base decisions affecting the country's welfare. The GNP and related national income and product component estimates are a key part of this data base. Their importance would be difficult to overemphasize.

The National Accounts Review Committee noted in its 1957 report that national economic accounts estimates and projections are necessary for the formulation of successful economic policies, just as accounting information is necessary for the intelligent operation of a business firm. Although the national economic accounts, and more specifically the GNP and related components, are not the only ingredient necessary for successful economic policies, data which are statistically inaccurate and conceptually inadequate can result in badly designed economic policies. Poorly designed policies can result in wasted or misused resources and serious inflation.

Given the widespread impact which policymaking uses of the estimates may have on the Nation's economy, their accuracy and reliability are of obvious concern. The lack of precise error measures for the estimates--even though there are valid reasons why they cannot be provided--limits users' and researchers' capability to judge how accurate the estimates are and should be. Alternative means have been used to evaluate the reliability of the estimates, but no conclusive agreement was apparent, as we noted in chapter 4 on the studies of the revisions.

With the lack of precise error measures, the need to improve the underlying data sources is difficult to demonstrate. Improvements to the data sources that input into GNP should make the data more accurate and reliable. But, to complete the discussion, information is also needed on how good the estimates need to be and what reliance is presently placed on them.

Another pertinent issue is the estimation procedures used in developing the GNP and related estimates. The procedures used to estimate the detailed components and adjust source data are selected by BEA to improve the estimates' accuracy. Adjusting the underlying source data and using judgment in the estimation process, however, may increase the opportunity of introducing error into the estimates. Detailed up-to-date information on BEA's methods is presently not available in a comprehensive handbook. To understand the estimates' limitations users need to know the actual procedures used and how these procedures might impact on the estimates.

Aside from the issue of statistical accuracy, the relevance of the accounts' concepts and classifications to users' needs is also of consequence. The GNP measure is used to indicate both the economy's performance and the national well-being. Redefining GNP to improve it as a measure of economic well-being, however, could detract from its usefulness for purposes of analyzing the market economy's performance. Improving GNP as a well-being measure need not impair GNP as a measure of economic performance. Information needed to assess well-being could be presented as a supplement which could be added to or subtracted from GNP to suit particular users' needs.

The aforementioned issues are the results of our limited study of the national income and product accounts and are not presumed to be all-inclusive. Given the size and complexity of the accounts we are not certain if the questions surrounding the issues can ever be fully answered. Our intent in this study is to draw attention to this highly technical and complex subject, focus attention on the issues, and encourage others to express their views.

NATIONAL INCOME AND PRODUCT COMPONENT DEFINITIONS

Business transfer payments	Income of persons from business for which no goods or services are received in return. Such items include consumer bad debts, corporate gifts to nonprofit institutions, and personal injury payments to persons other than employees.
Capital consumption adjustment	Difference between depreciation reported at historical cost for tax purposes and depreciation at replacement cost based on the estimated service life of the asset.
Capital consumption allowances	Estimates of wear and tear, obsolescence, destruction, and accidential losses of physical capital at their historical cost. Capital consumption in the accounts includes depreciation charges by businesses and nonprofit institutions, depreciation of owner occupied dwellings, and accidental damage to fixed business capital. Depletion of natural resources are not included.
Charges against gross national product	Cost incurred and profits earned in the production of gross national product.
Compensation of employees	Income accruing to employees as remuneration for work. It is the sum of wages and salaries and supplements to wages and salaries, such as employer contributions to social insurance, private pension, health and welfare funds, and injury compensation.

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Corporate profits	Earnings of corporations organized for profit. Profits are reported without deduction for depletion and exclude capital gains and losses. Earnings are adjusted for inventory valuation and capital consumption.
Government purchases	Goods and services purchased by the three levels of government--Federal, State, and local--and gross investments of government enterprises. Purchases include compensation of government employees, construction expenditures on highways, bridges, and schools, and purchases of equipment, supplies, and services.
Gross national product	Expresses in dollars the market value of goods and services produced by the Nation's economy within a specific period of time, usually for a calendar year or a quarter of a year at an annual rate.
Gross private domestic investment	Fixed capital goods purchased by private business and nonprofit institutions and the value of the change in the physical volume of inventories held by private business. Purchases of dwellings are included as fixed capital.
Indirect business taxes and nontax liability	Tax liabilities paid by business, other than employer contributions for social insurance and corporate income taxes. Sales taxes, excise taxes, and real property taxes paid by business are the principal types of indirect taxes. Nontax liability represents business payments for fines, copyrights, royalty payments, and penalties.

Inventory valuation adjustment	Gains or losses included in book profits due to differences between replacement and original cost of goods taken out of inventory.
National income	Total earnings of labor and property from the production of goods and services.
Net exports	Exports less imports of goods and services. Exports are part of national production and imports are not, but imports are included in the components and are therefore deducted.
Net interest	Excess of interest payments made by the domestic business sector over its interest receipts plus net interest received from abroad.
Net national product	Gross national product less capital consumption allowances with capital consumption adjustment, which are deducted from gross private domestic fixed investment to express it on a net basis.
Personal consumption expenditures	Goods and services purchased by individuals and nonprofit institutions which render services principally to individuals. The value of food, fuel, clothing, rent of dwelling, and financial services received in kind by individuals is also included. The rental value of owner-occupied dwellings is included, but the purchase of the dwellings is classified as gross private domestic investment.
Proprietors' income	Earnings of unincorporated business--proprietorships,

APPENDIX I

	partnerships, and producers' cooperatives--from their operations. Capital gains and losses are excluded and no deduction is made for depletion. Supplementary income from rental property to individuals is included in the rental income component.
Rental income of persons	Earnings of individuals from renting real property, such as a house, store, or farm. Also included are the imputed rental value of owner-occupied dwellings and royalties from patents, copyrights, and rights to natural resources.
Statistical discrepancy	Amount by which gross national product differs from charges against gross national product. It arises because both estimates are made independently by a methodology subject to error.
Subsidies less current surplus of government enterprises	Subsidies are monetary grants provided by Government to business. Current surplus of Government enterprises is the excess of sales receipts over operating costs. Such enterprises include the U.S. Postal Service, the Commodity Credit Corporation, and the Tennessee Valley Authority. These are distinguished from other Government activities by the fact that they are financed by the sale of a product or service rather than through general taxes.

APPENDIX II

GNP, NATIONAL INCOME,
AND CONSTANT DOLLAR GNP
1929 - 1980
(billions)

Year	GNP	National Income	Constant Dollar GNP (In 1972 Dollars)
1929	$ 103.4	$ 84.8	$ 315.7
1933	55.8	39.9	222.1
1939	90.9	71.4	319.8
1940	100.0	79.7	344.1
1941	125.0	102.7	400.4
1942	158.5	135.9	461.7
1943	192.1	169.3	531.6
1944	210.6	182.1	569.1
1945	212.4	180.7	560.4
1946	209.8	178.6	478.3
1947	233.1	194.9	470.3
1948	259.5	219.9	489.8
1949	258.3	213.6	492.2
1950	286.5	237.6	534.8
1951	330.8	274.1	579.4
1952	348.0	287.9	600.8
1953	366.8	302.1	623.6
1954	366.8	301.1	616.1
1955	400.0	330.5	657.5
1956	421.7	349.4	671.6
1957	444.0	365.2	683.8
1958	449.7	366.9	680.9
1959	487.9	400.8	721.7
1960	506.5	415.7	737.2
1961	524.6	428.8	756.6
1962	565.0	462.0	800.3
1963	596.7	488.5	832.5
1964	637.7	524.9	876.4
1965	691.1	572.4	929.3
1966	756.0	628.1	984.8
1967	799.6	662.2	1,011.4
1968	873.4	722.5	1,058.1
1969	944.0	779.3	1,087.6
1970	992.7	810.7	1,085.6
1971	1,077.6	871.5	1,122.4
1972	1,185.9	963.6	1,185.9
1973	1,326.4	1,086.2	1,255.0
1974	1,434.2	1,160.7	1,248.0
1975	1,549.2	1,239.4	1,233.9
1976	1,718.0	1,379.2	1,300.4
1977	1,918.0	1,546.5	1,371.7
1978	2,156.1	1,745.4	1,436.9
1979	2,413.9	1,963.3	1,483.0
1980	2,628.8	2,121.4	1,481.8

Source: Survey of Current Business

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