

THE NATIONAL INCOME AND PRODUCT ACCOUNTS

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This article is the first of a series that will be published by this Bank under the title Macroeconomic Data: A User's Guide. That book will contain introductions to important series of macroeconomic data, including prices, employment, production, and money. It will replace "Keys to Business Forecasting," which has been distributed since 1964. Although there are many sources that describe data concepts, surprisingly few deal with practical problems that may confront users. A characteristic of Macroeconomic Data will be that its articles discuss the seemingly small points that can make the difference between successful and unsuccessful attempts to use data.

It would be hard to overstate the value of the national income and product accounts to economists. They summarize the millions of economic transactions that occur in the nation each day and present the data in a readily comprehensible form. Their important role can be observed by noting that discussions of current economic conditions usually focus on real gross national product (GNP) and its components. In addition, macroeconomic research critically depends on the hundreds of interrelated items in the accounts.

This article is an introduction to the national income and product accounts. It briefly describes the history of the accounts, explains basic concepts, details the main structure of the accounts, and reviews the movement of key elements over time. Throughout the article there are cautions for users who might expect more than the accounts can deliver. And finally, it provides suggestions for additional reading for readers who would like to learn more than is provided in this brief introduction to the accounts.

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Introduction

History National income and product accounts are a fairly recent invention. Prior to World War I they were prepared for only a few countries by individual investigators who wished to study particular questions, such as understanding the effects of government budgetary actions.

During the interwar period governments became increasingly involved in the preparation of national economic accounts. In part this was because governments had relatively inexpensive access to data such as tax returns and other documents that individuals and firms were required to file. Also, a growing interest in using government fiscal actions to influence national economic performance increased the demand for detailed information on the current state of the economy.

In the United States, the Commerce Department first prepared national income estimates in the early 1930s; national product estimates followed in the early forties. These estimates played an important role in economic planning in the United States during World War II.

The widespread intellectual acceptance of John Maynard Keynes's *The General Theory of Employment, Interest, and Money* did much to stimulate interest in the accounts. Keynes emphasized macroeconomic relationships—that is, relationships stated at a highly aggregated level, such as the relation between national investment and national product. Keynes also strongly advocated the use of national fiscal policy to moderate fluctuations of national output and to stimulate long-term growth. The major uses of income and product accounts—appraisal of current conditions, the analysis of fiscal policy, forecasting economic activity, and research concerning the relations of macroeconomic aggregates—all fit comfortably within a Keynesian framework. Many users today, however, would not label themselves as Keynesians. Use of the accounts has grown far beyond any single group.

Preparation The national income and product accounts are now prepared by the Bureau of Economic Analysis (BEA), an agency of the United States Commerce Department. The BEA has prepared estimates for most items going back to 1929. Most of the data used by the BEA are first collected by other branches of the government for purposes other than constructing national income accounts. One important source of data is the tax returns of firms and individuals. Another is the large and varied group of surveys that are conducted at regular intervals. Important examples include Census Bureau surveys of retailers and manufacturers, and Labor Department surveys of prices.

Although some data series like personal income are published monthly, most items are only available at quarterly or annual intervals. Estimates for a particular quarter are first released during the third week after the end of that quarter. At that time, the BEA has data for about two-thirds of GNP; it therefore estimates the remaining items. As the BEA continues to receive data, the preliminary estimates are revised twice at monthly intervals. Then in July of each year, further revisions are published along with estimates for series that are published annually. Finally, new information, conceptual changes, and statistical changes are incorporated by benchmark revisions, which occur about every five years.

Gross National Product Defined

GNP is the most widely followed statistic in the income and product accounts. It can be succinctly defined as the market value of current, final, national production during a specific interval of time. That succinct definition, however, requires a bit of explanation,

Value Market value means that, when possible, goods and services are valued at prices actually paid in market transactions. In some cases, such as national defense and other services provided by the government, there are no market prices available. An alternative estimate of the value of those products, such as the cost of production for goods and services provided by government agencies, is therefore substituted for market value. For another important item, owner-occupied housing, an estimated rental value is included in GNP.¹ And some transactions

¹In effect, the homeowner is treated as a business that rents the home to itself. This has several effects for the accounts, including: (1) spending for new homes is part of business investment; (2) the estimated rental value

that occur outside the marketplace are excluded from GNP. Examples include production within households and illegal activities.

By focusing on market values, it is indeed possible to add apples and oranges. The focus on market values is a key insight that has powerfully aided economic analysts. It allows one to combine production from vastly different activities into a meaningful aggregate.

Current Current production simply means that GNP for a year only includes production that occurred during that year,

Final The concept of final product is less obvious; its necessity can best be illustrated with an example. Suppose that one farmer grows a bushel of wheat, mills the wheat, bakes bread, and sells the bread in front of the farmhouse. Another farmer grows a bushel of wheat but sells it to a miller, who sells flour to a baker, who then sells bread. In each case the contribution to GNP is the value of the bread, the final product. Yet if the dollar value of all sales in the market were simply added up, the second example would have a higher sum than the first. In other words, simply adding all sales would overstate GNP; that error is often referred to as double counting. To avoid that error, one can focus on the value added in each step of production. In the second example, the contribution to GNP of the baker is the difference between the revenues from selling bread and the cost of the flour. The values added by the baker, miller, and farmer in the second example would sum to the value of the bread and would therefore equal the value added by the farmer-miller-baker in the first case.

National National product refers to the output of productive factors of a particular nation. Production from the labor of a nation's residents and the capital of its residents' corporations is therefore included in gross national product. Many countries prefer to focus on gross domestic product (GDP), the output of productive factors located within a particular nation. The distinction between national and domestic product is most important for locating the value added by multinational firms. The value added by overseas branches of American firms is included in United States GNP, but not United States GDP.

of owner-occupied housing is part of consumer spending; and (3) the rental value minus expenses, such as interest, taxes, and depreciation, is part of personal income.

For the United States, the quantitative difference between the two is not large; in 1985, GNP was only one percent larger than GDP.

Gross The word “gross” refers to the fact that depreciation of structures and equipment is not subtracted from the value of output. Conceptually, it might seem preferable to recognize that some part of production just replaces the capital consumed in the production process, and in fact the BEA does estimate national product net of capital consumption, net national product. There are usually no direct measures of capital consumption, however. Capital consumption is therefore indirectly estimated for each type of capital good by government statisticians who use an accounting formula. Since many analysts question the accuracy of any such formula, they prefer to focus on gross national product, because its calculation does not require a probably inaccurate estimate for depreciation.

Real The concept of market value allows different products to be meaningfully added at a particular time. But since market value is expressed in dollars, another problem arises when comparing production at different times. Changes in the purchasing power of a dollar (which are reflected in statistics of inflation or deflation) will distort the meaning and relevance of comparative dollar magnitudes.

The concept of real GNP is an attempt to allow production in different years to be meaningfully compared. It is an estimate of GNP in dollars of constant purchasing power. (Estimates of real GNP are thus often referred to as “constant dollar” values.) In most cases, the dollar value of each particular good or service is divided by a relevant price index, yielding the constant dollar value. The constant dollar values for all items are then summed to yield real GNP. The ratio of current dollar GNP (often called nominal GNP) to real GNP is the GNP implicit price deflator. It will be discussed in a forthcoming article on aggregate price data.

Components of GNP

It is often useful to think of total spending rather than total production. That is facilitated in national product accounts by the way components of GNP are defined. Anything produced is either sold to its final purchaser or else held as inventory by some business, whether producer, wholesaler, or retailer. The sum of spending for final products plus changes in businesses’ inventories is therefore equal to the market value of production.

GNP is traditionally divided into spending in four categories, or sectors : consumer, business (including inventory change), government, and foreign. Each sector is described in this section, and numerical values for 1985 are presented in the table.

Consumer The consumer sector is the largest, accounting for 65 percent of GNP in 1985.² Spending by consumers is divided into spending for durable goods such as autos, nondurables such as food and services. Services consist of a wide variety of components such as utilities, medical care, transportation, and the estimated rental value of owner-occupied housing.

Business Spending by the business sector, also labeled investment,³ is composed of three major categories. The most obvious is business spending for plant and equipment. Also included are changes in business inventories, including raw materials, work in progress, and completed products awaiting resale to their final purchaser. The third category is spending on residential construction, which includes both residential structures owned by business enterprises and owner-occupied housing.

Government Government spending is divided between federal spending and spending by state and local governments. In the national income and product accounts government spending refers solely to spending for goods and services-transfer payments, such as pensions, welfare, and interest, do not add to GNP.

Foreign The foreign sector’s effect on GNP is given by net exports, the difference between exports and imports. Net exports include both physical commodities and services, such as insurance, transportation, tourism, and corporate earnings from foreign operations.

Income

In the previous section the equality of production and spending was mentioned. There is another basic

²The consumer sector also includes certain nonprofit institutions, personal trusts, and private pension funds. For most analysis it is probably appropriate to neglect this qualification; in the discussion below, however, it should be remembered that the words “consumer” and “person” often refer both to individuals and these institutions.

³The word “investment” in the income and product accounts only refers to spending for physical capital, or for the value of inventory change. It is therefore different from ordinary usage, in which “investment” can also refer to the purchase of financial assets.

NATIONAL INCOME AND PRODUCT, 1985

Billions of Dollars

Product		Income	
Personal Consumption Expenditure	2582.1	Compensation of Employees	2372.4
Durables	361.1	Wages and salaries	1960.2
Nondurables	912.3	Supplements	412.2
Services	1308.8	Proprietors' Income	242.3
Gross Private Domestic Investment	668.6	Farm	21.3
Business fixed investment	475.8	Nonfarm	220.9
Residential investment	185.6	Rental Income of Persons	14.0
Inventory change	7.2	Corporate Profits	296.2
Net Exports	- 76.9	After-tax profits	139.5
Exports	370.2	Profits-tax liability	85.5
Imports	447.0	Adjustments	71.2
Government Purchases	815.3	Net Interest	287.2
Federal	355.0	Other Charges Against GNP	776.4
State and local	460.3	Capital consumption	438.5
Gross National Product	3989.1	Indirect business taxes	328.5
		Other items, net	9.4
		Statistical Discrepancy	0.7
		Gross National Product	3989.1

Source: Survey of Current Business, February 1986, Tables 1.1, 1.9, and 1.14.

equality in the accounts, that of spending and income. Revenues from the sales of goods and services are collected by businesses. Payments by businesses for wages, rent, and the like are income for individuals. By definition, profits represent the difference between a firm's payments for inputs and its revenue from the sales of products. Adding up for all firms, their profits are therefore equal to the difference between aggregate revenues (spending) and costs (incomes to others); consequently, national income and national spending are equal by definition.

If all components of income and product were measured precisely, the value of production would equal the sum of incomes received. It is therefore possible to construct a national balance sheet such as the table with production on one side and income on the other. Since data collected by the government are necessarily less than perfect, errors in estimating the components of income and product are inevitable. One result is that the income and product sides of a national balance sheet are not exactly equal. The difference is referred to as the statistical dis-

crepancy. Other items on the income side are described below.

Employee compensation Compensation of employees is the largest category of income. It includes not only wages and salaries, but also fringe benefits paid by employers such as funding for pension plans and medical insurance. Also included are employer payments for social security and unemployment insurance taxes.

Corporate profits The estimated value of corporate profits is primarily derived from corporate income tax returns, but for many reasons does not precisely equal taxable profits of private corporations. One important reason is that the effect on profits from holding inventories when prices change is removed with an inventory valuation adjustment. Also, the difference between depreciation allowed by the tax code and the BEA's estimate of depreciation of corporate assets is removed with a capital consumption adjustment. In addition, Federal Reserve Banks are treated as part of the corporate sector.

Their interest receipts are treated as income ; their payments of most of their income to the U. S. Treasury are included in the BEA's measure of corporate tax payments.

Other income Proprietors' income includes earnings of individuals and partnerships from unincorporated businesses, such as physicians' practices, farms, and law firms. Rental income of persons includes items such as rental receipts and royalties. It also includes the estimated rental value of owner-occupied housing minus housing expenses. Net interest is a fairly complicated item. In broad terms, it represents individuals' receipts of interest income from businesses and from foreign sources minus individuals' interest payments.⁴

Non-income items Other charges against GNP are non-income items, most importantly capital consumption allowances and indirect business taxes. The latter includes federal excise taxes and state and local sales and property taxes.

Definitions of income There are several definitions of income that are published in the income and product accounts. National income, the total income from current production, is the sum of employee compensation, proprietors' and rental income, corporate profits, and net interest. More attention is paid to personal income, which includes wages, salaries and other labor income ; proprietors' and rental income; and personal receipts of interest, dividends, and transfer payments. A closely related measure, disposable personal income, is personal income minus personal tax payments and other payments to government agencies.

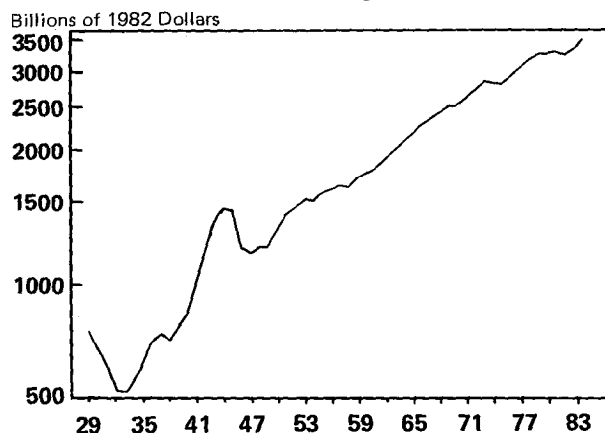
Movements over Time

Countless books and articles containing studies of long-term growth, cyclical change, and shifting patterns of economic life have been based on data from the national income and product accounts. Only a few broad features will be mentioned in this section.

A striking feature is the amount of economic growth that is revealed. Chart 1 illustrates the movement of real GNP from 1929 to 1985. Despite the Great Depression and other fluctuations, real GNP increased fivefold during that interval—a 2.9 percent compound annual rate of growth. Chart 1 also il-

⁴Some arcane adjustments for households' dealings with financial institutions are also included. Those adjustments also affect estimates of consumer spending for financial services.

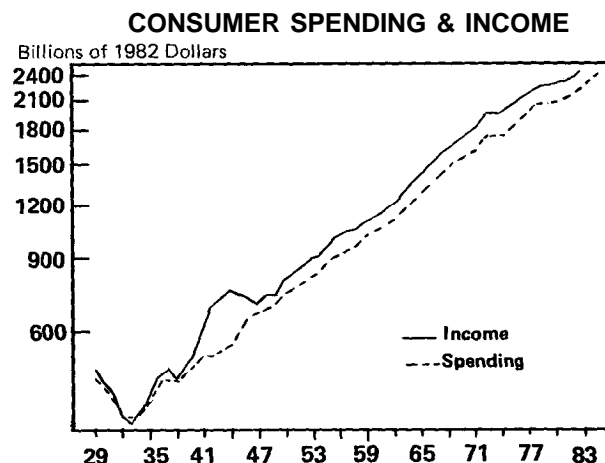
Chart 1
REAL GNP



lustrates the massive decline of real GNP during the Great Depression, the equally massive expansion during World War II, and the smaller fluctuations of output in the postwar period. Chart 2 reveals similar growth, but less fluctuation, in real consumer spending and disposable income.

The accounts also reveal some important changes in the structure of the economy. The expanded role of government is illustrated by its spending for goods and services, which has risen from less than 9 percent of GNP in 1929 to more than 20 percent in 1985. Foreign trade also plays a more important role in the economy than it has in the past, with exports rising from about 5 percent of GNP in the 1930s to 11 percent in the 1980s.

Chart 2



Cautions

Considering the amount of data consistently measured over time and the complex interrelations revealed among disparate items, the national income and product accounts are a remarkable achievement. In part because the accounts do so much so well, users can be tempted to expect more of the accounts than they can deliver. A few potential problems have already been mentioned; in this section other potential pitfalls are discussed.

First, it should be emphasized that the national income and product accounts only measure production, spending and income. They were not designed to measure economic welfare—that is, how highly individuals evaluate the economic rewards they receive minus the cost of obtaining them. Despite the limited focus of the accounts, it is still common for some observers to see differences in national product between nations as evidence of different standards of living. Such comparisons should be discounted for many reasons, a few of which follow:

(1) Some items included in GNP do not directly raise individual welfare. For example, military spending is like intermediate product—it can provide necessary protection that allows other economic activity to proceed, but is not valued for its own sake. Citizens of a nation that is able to obtain adequate defense for 1 percent of GNP can consume and invest more, thus having a higher standard of living, than citizens of a nation with the same GNP who had to spend 10 percent of GNP for defense.

(2) Some items are not included in GNP that do make people better off. For example, unpaid household work may be highly productive but is not included in the national income and product accounts.

(3) There may be unmeasured external effects that result from productive activity. For example, the production of electric power may involve an unmeasured damage of pollution from burning coal. Two countries could have the same GNP but differ in the cleanliness of air and water.

(4) Other countries may use different data sources or even different concepts to produce income and product estimates. Socialist countries, for example, will lack many market prices used in the U. S. accounts. Also different governments may not have access to similar quantities or qualities of data.

A second caution is that it is possible that the definition of an item in the accounts may not be the best definition for a particular study.

For example, many economists have studied the relationship between consumer saving at one time and consumer spending during later time periods. The definition of saving in the accounts is probably not appropriate for that question, however, since capital gains and losses are excluded from personal income and saving (because they do not result from current production). Their potential importance is illustrated by rising stock and bond markets in 1985, which added hundreds of billions of dollars to consumer wealth but were not income or saving as defined in the income and product accounts.

Third, the construction of the national accounts requires choosing among alternatives that each has drawbacks. One example is converting nominal expenditures to real magnitudes. The decision to estimate constant dollar values has greatly enhanced the utility of the accounts. There are side effects, however.

The BEA's approach is to define one year as a base year and to compare conditions in other years with the base year. That is, "real" magnitudes in other years are hypothetical values, such as quantities exchanged in 1960 valued at prices paid in transactions in 1982. Constructing those hypothetical values allows the tracking of changes in volumes of particular items over time, but can also distort relationships in the accounts. For example, from 1958 to 1973 net exports in current dollars were positive each year, averaging over \$7 billion. When measured in 1982 dollars, however, net exports were negative in 15 of the 16 years, averaging -\$18 billion. The actuality of a trade surplus was therefore converted into a "real" deficit by using 1982 as a base period.

Fourth, the data that the BEA receives from other government agencies may not be accurate.

For example, to the extent that individuals or firms file inaccurate tax returns in order to reduce their tax liabilities, the tax collectors will give the BEA inaccurate data. Moreover, if someone has given false information to one government agency, the likelihood of that person giving false reports to other agencies is increased. Census surveys, therefore, could also be affected by tax-induced misreporting of income and expenditure. Although

the BEA does attempt to estimate tax-induced misreporting, there is no way to determine the accuracy of those estimates.

These cautions should not prevent one from using the accounts. Rather, the cautions should prompt the user to think about the problem and the data before simply assuming that the data are appropriate. The limitations of the accounts are real, but should be kept in perspective. The accounts provide consistently estimated data for more than fifty years for hundreds of items. They provide an unsurpassed picture of economic performance. As the longtime head of the BEA George Jaszi put it, the income and product accounts "are eminently useful in macroeconomic analysis if they are not regarded as a precision instrument and . . . may be lethal if they are."

Suggestions for Additional Reading

There is a large literature on the subject of national income and product accounts. Rather than attempting to survey the whole field, a few sources are mentioned which should be especially helpful to readers who wish to pursue the subject.

The *Survey of Current Business* (SCB), published monthly by the Commerce Department, contains recent estimates of items in the income and product accounts and articles on selected topics related to national income accounting. One of the most useful publications on the subject is the *National Income* supplement to SCB, 1954 edition, parts II-IV. It contains 132 large format pages of detailed definitions and discussion of the methodology for

estimating components of the accounts. More recent discussions are contained in "The National Income and Product Accounts of the United States: An Overview," SCB February 1981, and "An Introduction to National Economic Accounting," SCB March 1985.

For many readers, less technical summaries of the accounts may be useful. Introductory economics textbooks usually contain descriptions of the accounts ; a particularly good presentation is contained in Paul Samuelson's *Economics*. Also, *The U.S. Economy Demystified* by Albert T. Sommers has a clear, user-oriented description and discussion of the accounts.

Building on the framework of the BEA's accounts, Robert Eisner has constructed a set of statistics that attempt to narrow the gap between national product accounts and statistics that more directly attempt to estimate economic welfare. "The Total Incomes Systems of Accounts," SCB January 1985, contains a discussion of his approach and detailed tables of data for selected years.

Finally, it may be of interest to study the history of national income accounts. A prime source is John W. Kendrick, "The Historical Development of National Income Accounts," *History of Political Economy*, Fall 1970. A more narrow focus on U. S. accounts is given by Carol S. Carson, "The History of the United States National Income and Product Accounts," *Review of Income and Wealth*, June 1975. Further insight into the design of the U. S. accounts can be found in George Jaszi's "An Economic Accountant's Audit," *American Economic Review*, May 1986.