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PART IV

Problems of Interpretation

Before national income estimates can be interpreted properly, (a) the basic assumptions underlying them, (b) their statistical accuracy, (c) the significance of their levels, trends, and short term variations must be scrutinized. Under (a) are questions concerning the scope of activities whose results are included in national income; the distinction between their gross and net product; the basis upon which products of various description are evaluated and added; the boundaries of the nation in the definition of 'national' income; and the like. Under (b) are questions concerning the statistical approach, the character of the primary or derived data, the validity of the procedures used to approximate sectors for which data are lacking, the margin of error in the final estimates. Under (c) are the numerous questions that arise when we try to interpret the evidence of national income estimates in the light of other knowledge or processes and interrelations in the economy; the relations between changes in national income totals, their components, and other aspects of the economic system; the causes of the levels or changes, i.e., their association with factors whose effects are known from information other than national income data proper; and so on.

These three groups of questions have so far been commented upon only casually, and obviously cannot be analyzed adequately here. In choosing the few that can be, we omit questions under (b) and (c). The former cannot be discussed effectively except with the help of extensive notes and tables; and the interested student should turn to the publications containing the detailed descriptions of sources and procedures, most of which are cited in the tables or footnotes above. Questions under (c) can hardly be analyzed properly, except

in studies of some specific problem, where estimates of national income and its components are one of several bodies of relevant data. It is, therefore, impossible here to go beyond the tentative suggestions advanced above in discussing what estimates of national income show concerning its structure, long term trends, and short term changes.

Even of the questions under (a), only those are treated that seem to bear most directly upon a proper understanding of the meaning of national income estimates. Other problems are noted, but not discussed; still others are not even mentioned.

1 *The Distinction between Net and Gross*

In computing a national income total for a year, we count the products turned out, the resources put in, or the monetary counterparts of either. In such a count, a major problem is to avoid duplication. If we add commodities and services, it would obviously be duplication to include both the value of coal produced and the value of the commodity produced in consuming the coal. If we add input of resources, it would obviously be duplication to include the input of both the machine and the labor expended on its repair or replacement. If we add monetary counterparts, in the form of payments for products or resources, it would obviously be duplication to include both payments by consumers for butter and payments by butter producers to farmers for cream. National income is net in that no duplication of this kind inflates the total, so far as it can be avoided. Any total inflated by duplication is qualified as 'gross'. The distinction between net and gross hinges then upon how duplication is avoided.

The simplicity of the examples cited may mislead us into thinking that the problem could be easily resolved by applying the test of physical disappearance. We consider it duplication to include both cream and butter, because cream has physically vanished or, rather, assumed the form of butter. Hence, we could presumably avoid duplication if in adding products turned out during the year, we excluded those consumed in the production process, i. e., the ones that lost their physical identity and

became embodied, as it were, in products that were *not* so consumed.

But how shall we (a) define the production process, and (b) treat items that apparently remain unchanged, yet are said to be consumed in the production process?

a) Is the loss of the physical identity of butter consumed in the household by the wage earner and his family, and its embodiment in the health and efficiency of present and future workers consumption in the production process? Is the maintenance and increase of the country's population and of its efficiency a productive process similar to that of turning out steel or perfume? If so, we must, to avoid duplication, exclude from the total of commodities and services turned out during the year not only those consumed in producing other goods but also all those consumed in the household in maintaining and increasing the country's productive population and its efficiency; but include the value of that increase. Or do we consider consumption in households part of life in general rather than a production process, and the supply of goods to households a primary purpose of economic activity to which the latter is subordinate? If so, we must classify consumption in households as *ultimate*, consumption in the production process as *intermediate*, and include in national income the full value of goods flowing to households, even though most of them lose their physical identity.

b) In practice, consumption in the production process is allowed for even when physical destruction is not evident; e. g., for durable capital items such as a building or a machine. While some instruments have been devised to record the rate of physical destruction for long lived equipment, depreciation is based less on any observed physical deterioration than on an assumption of economic loss. Technical progress, changes in tastes, etc., tend to make equipment obsolescent before it is worn out.

The test of physical destruction or transformation in the production process does not, therefore, automatically resolve the problem of avoiding duplication in measuring national income. Of the two problems its application raises, outlined

above under (a) and (b), we discuss solely the first in the light of the goals of economic activity and the consequent distinction between ultimate and intermediate consumption (or a parallel pair of concepts, final and intermediate goods).

As we have just seen, if no ultimate goal is set to economic activity—except mere increase in the supply of goods—all consumption becomes part of the production process; to eliminate duplication, all goods consumed during the year are excluded, and national income equals the value of net additions to the population and its efficiency plus the value of net additions to stocks of commodities or of claims against foreign countries. But if we assume that the primary objective of economic activity is to provide goods to satisfy wants of the members of the nation; that national income is for man and not man for the increase of the country's capacity and national income, then ultimate consumption can be defined as the use of goods in direct fulfilment of this primary objective and measured as the sum *at full value* of all goods placed at the disposal of ultimate consumers during the year; plus such changes in the stock of intermediate goods as affect the future supply of goods to consumers—*net* changes in the stock of all commodities (outside households) and of claims against foreign countries.

This is the widely accepted definition of national income. It rests upon the basic assumption that to provide goods to consumers is the primary purpose of economic activity. It recognizes as duplication the inclusion of goods consumed in the production process alone; and defines the production process to exclude the goods consumed in maintaining the inhabitants and enabling them to grow and multiply. It includes the *gross* value of the flow of goods to ultimate consumers and the *net* value of changes in the stock of capital goods.

If the recognition of a consumption process as representing the satisfaction of an ultimate goal of economic activity permits inclusion of goods so consumed in national income, recognizing other ultimate goals would lead to a larger total. Indeed, one could argue that at some periods other purposes of economic activity emerge; e.g., provision of weapons for military conflict

in time of war. If it is recognized as another primary goal, the gross value of war output must be included in national income, which would then exceed that estimated by treating war output as a species of capital formation (subordinate to the basic aim of providing goods to consumers) and therefore including only the net change in inventories of war goods.³⁰

The basic assumption concerning goals of economic activity can thus range from recognizing none except sheer increase of capacity as measured by population and capital—national income for national income's sake—to recognizing several so that the flow of several categories of products is taken at their gross value (goods to ultimate consumers, goods for the armed conflict, certain categories of public or private capital). With these variations in basic assumptions, national income would vary.

Yet, though different basic assumptions are justified for some exceptional short periods, e.g., during a major war, that underlying the customary definition of national income can be defended as the sole valid one in the longer run, on either or both of two grounds. The first is the unique relevance of satisfying men's wants to national income as an *appraisal* notion. National income is not a measure of activity, of how much effort, toil, and trouble economic activity represents; but of its contribution, of its success in attaining its goal. Viewed in this light, there is no other long standing purpose except to provide the material means with which wants of the members of society, present and future, can be satisfied.

Second, the entire pattern of economic organization in modern society seems to have the provision of goods to consumers as its primary goal. The concern various social institutions manifest for maintaining and increasing the flow of goods to its members, and the subordination of other goals to that end cannot be demonstrated statistically, but is an impression conveyed by measures taken to ensure this primary goal and to overcome any serious obstacles to its attainment. At any rate, it is difficult to formulate a different goal of

³⁰For a more detailed discussion and statistical illustration of this point see *National Product in Wartime*, Part I.

economic activity of equally primary importance for most nations in the last century and a half.³¹

Yet, in taking this position, we should consider one possible qualification. While provision of goods to consumers may be recognized as the primary goal of economic activity, and hence the flow of such goods treated as ultimate rather than intermediate consumption, is all of it wanted by consumers *qua* consumers? Is not some of it wanted by consumers in their capacity as producers? That part would represent an occupational expense—intermediate rather than ultimate consumption. If a man spends a portion of his income on bus fares to travel to and from work, are bus services a flow of goods to him as an ultimate consumer? What about education preparing individuals for their occupations, or the demand for certain goods for living at a level that facilitates the individual's success as a producer?

Unquestionably, in our industrial, urban civilization many items of ultimate consumption are chosen for the sake of productive efficiency, and could be classified as intermediate rather than ultimate consumption. But the distinction is tenuous; and carrying it too far would bring us right back to denying the possibility of ultimate consumption altogether. For if education is conceived simply as preparation for livelihood and

³¹If one entertains a social philosophy in which the criteria of economic activity are other than the satisfaction of consumers' wants (e.g., the test of contributing to the military glory of the state or the honor of the nation couched in terms of blood and soil) one would not accept the provision of goods to consumers as the primary goal. Likewise, if one's view of economic institutions leads to the conclusion that they, in fact, are not organized for the purpose of enhancing the material welfare of consumers, the second ground for accepting the latter as the primary goal in defining national income is absent. In these cases, another definition of national income is called for; and another total, if the concept is at all measurable, would result.

This has distinct bearing upon international comparisons of national income, when made for economies differing widely in the character of their social organization and goals; or for inter-temporal comparisons for one and the same country when the character of social organization and goals have altered radically. In such cases, the application of the customary definition of national product means, in fact, applying criteria that may be relevant to one term of the comparison but not to the other. Even so, there may be significance in judging the net contribution of two or more national economies by the criteria recognized by one alone.

not as the enhancement of living, and if a man's residence and its appurtenances are counted simply as the domestic equipment appropriate for the production of his income, then, since the satisfactions of the consumer are inextricably bound up in the circle of means and ends with the needs of the producer, the whole category of ultimate consumption disappears. As long as we recognize the latter as the purpose of society, we must avoid overstressing the occupational orientation that may be present in some degree in this or the other sector of the flow of goods to consumers. While the flow of goods to consumers is inflated in that it includes some intermediate consumption in addition to ultimate, the 'grossness' of the flow, and of the national product total of which it is the preponderant part, is limited.

2 *Why Gross National Product?*

If we accept the definition of national income just discussed, the total is net only in the sense that all consumption of intermediate goods is subtracted, not in that *all* consumption is subtracted. Totals that may be termed 'gross' differ from net in that they are gross of some intermediate consumption, in that there is deliberate duplication in including both the value of the final products and of some intermediate goods consumed in turning them out. The reason is that these gross totals may be useful as measures of activity, for national income measures net product or contribution alone.

This difference in purpose may be illustrated by 'gross national product', as defined and estimated in the National Bureau's studies of capital formation, and 'gross national product at market prices', as defined and estimated by the Department of Commerce. The former does not deduct the current consumption of durable capital, such as buildings or producers' equipment. Gross of that consumption, it exceeds national income by that amount. The reason for this deliberate duplication is that, in practice, the distinction between the need for durable capital for replacement and the demand for durable capital for additions is quite tenuous, in the *short* run. Within a relatively short period, the capacity of an item of durable

equipment is elastic; and in few, if any, items does physical deterioration compel replacement, leaving no discretion to the entrepreneur. If, therefore, we wish to understand short term variations in the flow of durable capital, we should measure it gross rather than net, since short term decisions, whether of private or public entrepreneurs, are more likely to be in terms of replacement and additional demand combined than between capital for replacement and capital for new additions. Likewise, the effect of entrepreneurial decisions on short term variations in volume of activity is clearer when we deal with a total that includes its determining component, i.e., gross rather than net capital formation.

The Department of Commerce's 'gross national product at market prices' is gross in that it does not allow for the consumption of durable capital in private hands; or for the part of government expenditures that represents depreciation on government owned durable capital goods or the value of services contributed by government to private enterprises and consumed by the latter in the production process. Thus, while at the final product level, national income or net national product is the sum of the flow of goods to consumers and net capital formation, and our gross national product is the sum of the flow of goods to consumers and gross capital formation, the Department of Commerce's gross national product at market prices is the sum of (a) the flow of goods to consumers, minus government services to consumers, (b) gross capital formation under private auspices, and (c) all government expenditures for commodities and services.

As indicated in *National Product in Wartime* (App. I) the essential reason for a total in which both private capital formation and government activities are taken gross lies in the usefulness, for the study of short term changes, of measuring both the demand for capital by private enterprises and government activities in terms of gross capital formation and total government expenditures. If we conceive the demand for capital by private enterprises and total government activity as two independent variables whose short term variations generate changes in aggregate economic activity, then both private capital

formation and government activity should be treated gross. And the over-all measure of activity must also include both gross private capital formation and total government expenditures, since what is in the part must also be in the whole.

This orientation of the concept to the importance, as independent variables in short term changes, of the demand for capital by private enterprises and government expenditures is evident in the basic classification of the Department's gross national product at market prices. The three main components are consumers' outlay, private gross capital formation, total expenditures by government on goods (i.e., excluding pure transfer transactions). Of these three, the last two are considered variables subject to wide, independent changes in the short run. Government expenditures especially tend to be treated as a variable that can be affected by direct action much more easily than the passive though larger consumers' outlay, and the volatile but relatively uncontrollable private capital formation.³²

Many other gross totals could be calculated by segregating other sectors in the economy deemed sufficiently strategic for their activity to be conceived as an independent variable whose short term changes affect the activity of the economy at large. If we were to assume, for example, that agriculture is a sector that could be so classified, we would get a national total gross of the consumption of durable capital and of products of other industries by agriculture. The share of agriculture

³²In addition to the use of the concept in discussion of postwar problems, an earlier use of the Department of Commerce's gross national product at market prices was in connection with the analysis of government policy in war years. War demands were estimated in terms of war production and outlay programs, at gross value. Government policy with reference to the private sector could be formulated and implemented more easily in terms of gross than of net capital formation, and of consumers' outlay than of flow of goods to consumers (which includes direct tax payments as the measure of government services to individuals). Hence, for the purpose of analyzing the proximate effects of government policy in war years, a sum of these three gross components was more useful than the more abstruse (if in the longer run, more meaningful) net national product.

Consequently, a happier name for the Department's gross total might perhaps be 'total expenditures', since it represents a sum of outlays by individuals, by private enterprises (on capital), and by governments.

would then equal agricultural expenditures on all commodities and services (including those of independent farmers) instead of the net difference between total value product and the value of materials, semifabricates, durable equipment, and services of other industries consumed in its production. The usefulness of each of the many gross national products that could be defined and measured in this way lies in the validity of the assumption that the sectors selected as strategic and best understood in terms of their gross activity are indeed determinants of changes in total output and better studied in terms of gross than of net national product.

It would take us too far afield to appraise the validity of selecting this or that area for 'gross' treatment, whether as implied in the gross totals already discussed or in others that might be devised. But two comments are appropriate here. First, as we increase the number of sectors in the economy that can be distinguished and that, conceived in terms of their gross activity, are determinants of levels and changes in national product or foci of public policy, the gross national total becomes larger and larger since the duplication is correspondingly widened. The culmination of duplication as more and more sectors of the economy are recognized as determinants may make the grossest national total the sum of the expenditures (or intake) of each single producing enterprise in the country. Such a total would naturally be vastly larger than any gross total calculated so far; and many times that of national income.

Second, we reiterate that any gross total, precisely because it is gross, contains some duplication and inflation, and should not be confused with a net product such as national income. It is the latter that attempts to gauge the net result of economic activity, and it is its size and fluctuations that are the chief criteria in judging the success with which the economy functions. There may and possibly should be a legion of gross totals, reflecting different approaches to the ways different sectors of activity affect or can be made to affect the net product. They are auxiliary and subsidiary concepts needed to build up the chain of cause-effect relations that determine

the net end product, and useful as steps in technical analysis intended to bring out the proximate causes of failure or success. Regardless of technicians' interest in gross totals, society at large is interested primarily in national income, provided the implicit basic assumptions as to goals reflect its general views concerning what economic activity is for. Large gross totals do not necessarily ensure satisfactory levels and composition of the net product. Given the latter, there is little reason to worry about the levels and composition of any gross total.

3 *National Income and Welfare*

Do estimates of national income measure the net contribution of economic activity to its primary goal—provision of goods to individuals—without errors of commission and omission? Do all commodities and services ordinarily included contribute to the satisfaction of consumers' wants, present or future? Are all the goods, i.e., all the sources of satisfying consumers' wants, made available in any year included in national income as estimated in this country today? We consider first the possible errors of commission, then those of omission.

Things desirable in the eyes of one individual may be matters of indifference to the group of which he is a member, or even considered deleterious by many; and things wanted by the majority may be frowned upon by the minority. In determining what are goods from the viewpoint of satisfying consumers' wants, we cannot assign both positive and negative signs to those wanted by some but deemed pernicious by others, then strike algebraic balances. Rather we must decide what, on the whole, are goods and should be included. In the statistical measurement of national income the question reduces itself to what commodities and services should be excluded because, by and large, they do not contribute to the goal of economic activity—satisfaction of consumers' wants. Specific examples may range from services, such as are rendered Mr. Smith by a professional gang of killers in disposing of his rival Mr. Jones, to commodities, such as harmful drugs or useless patent medicines.

If in such a classification needs and relevance to needs were

defined in terms of an imagined application of scientific knowledge and broad principles of ethics, we would exclude from national income many commodities and services now included. Many foods and drugs are worthless by scientific standards of nutrition and medication; many household appurtenances are irrelevant to any scientifically established needs for shelter and comfort; many service activities as well as commodities are desired for the sake of impressing foreigners or our fellow countrymen and could hardly measure up to ethical principles of behavior in relation to the rest of mankind. National income, as estimated here, is subject to errors of commission in that it includes commodities and services that are not goods, i.e., do not contribute to the satisfaction of needs, *if* the criteria are scientific standards and broad canons of ethics.

It would be instructive to estimate national income as the sum of products that are unequivocally sources of satisfying needs objectively determined from the viewpoint of mankind as a whole. The estimate could be described as a given nation's share in the world's current new supply of 'approved' goods. Such estimates would aid national groups in appraising their social activities in general and their economic performance in particular. But they would not be what national income estimates as customarily prepared are designed to be—measures of the contribution of the nation's economy to satisfying the wants society recognizes as legitimate.

We exclude all illegal commodities or services, e.g., hired murder and the manufacture and sale of illegal drugs, as far as we can with the inadequate statistical data at hand. We include commodities and services not prohibited as long as they find a buyer (presumably they would not exist without one), though they may not be useful from any objective standpoint. In short, in the absence of society's explicit declaration to the contrary, the wants of the individual buyer are the criterion. Erratic the test of legality may be (consider the prohibition years) and difficult of application to certain activities (consider a shady business deal that has not as yet been prosecuted in courts and may never be), but it is the only one at the disposal of a national income estimator unless he sets

himself up as a social philosopher and decides to ignore the consensus of society as to what are not goods, i.e., not positive contributions to the approved ends of economic activity.

There are of course numerous payments and transactions that do not represent a commodity produced or a service rendered: and whenever national income is estimated from payments (rather than from the value of commodities and services), such transfers also are omitted; e.g., gambling gains, net gains on sales of capital assets without any preceding input of resources to account for the gain, and gifts. All these transfers among individuals may greatly affect the eventual shares various members of society receive of the current net product; but they do not directly determine its size, if it is defined as the net value of commodities and services produced during the year. The distinction between transfer payments and payments that are evidence of real production is scarcely so simple, but this is another of those problems we can no more than mention.³⁸

Judged in the light of all possible ways of satisfying consumers' wants, national income as customarily measured is subject to larger errors of omission than of commission. Errors of omission arise, first, from the deliberate restriction of national income to the net product of *economic* activity proper, and hence the deliberate exclusion of activities that may satisfy wants but are not economic. Even within the area of economic activities proper, especially if broadly defined, national income estimates omit some types of product. Finally, by definition, they neglect completely any consideration of such costs of economic activity as impinge directly upon consumers' satisfaction or the welfare of the community.

Life is full of activities that lead to the satisfaction of consumers' needs and hence their welfare, only some of which can be classified as economic. In extreme cases the distinction is easy. Taking a pleasant walk or playing a game of chess with a friend satisfies certain wants, but is not an

³⁸In actual measurement, transfers are sometimes included; but only because the production sources from which they arise cannot be measured directly. An illustration is the inclusion of relief payments by governments in totals that have government savings as an offsetting item.

economic activity; working in a factory or an office is. But what about the household services performed by the housewife and other members of the family? What about cultivating one's own vegetable garden?

It has become customary to base the distinction between economic and noneconomic activities on the closeness of ties with the market. Every pursuit whose products are either sold on the market or are largely directed toward it is treated as economic; no others are, though their yield in the way of satisfying wants may be substantial. This solution has a great advantage in that it segregates the sector of life concerned largely with economic activities, and in which measurement is feasible because the yardstick (no matter how it may have to be adjusted) is the market price. In a highly developed economy the disadvantages are reduced by the fact that the majority of the activities intended to produce goods for consumers are market-bound. Even so, the magnitudes omitted are far from minor. For example, the value of housewives' services are roughly estimated at some \$23 billion in 1929, or more than one-fourth of national income.³⁴ And in countries where the market is less developed than in the United States, the limitation of economic activities to those market-bound leads to a major undercount.

The national income estimator must choose between comprehensive definition—with the consequence that large sectors of the economy either cannot be measured on a continuous basis or cannot be included with more precisely measurable sectors because the errors are so enormous—and a narrower definition that confines economic activities to those market-bound—for which tolerably reliable estimates can be made. In current national income measurement in this country, the decision is usually in favor of the second alternative. And it finds support in the argument that the activities so segregated for measurement are the ones subject primarily to economic criteria and rationale; whereas those that are not directed at the market are much more a part of life in general. One may

³⁴See *National Income and Its Composition*, Vol. Two, p. 433.

and does discharge a housekeeper for inefficiency in managing a household, but by itself this is rarely a ground for divorce.

However justified, this limitation results in omitting a substantial group of activities important in satisfying the needs and wants of the members of society. Moreover, some market-bound activities are omitted largely because they cannot be measured on a continuous basis—taking boarders or lodgers, spare-time jobs, and the like. In coverage, a continuous national income series is thus always on the short side even in terms of market-bound activities, which it tends to omit if they are casual and hence elusive of measurement.³⁵

The national income estimator cannot do much about such omissions, since scarcity or lack of data is inherent in the nature of the omitted areas. But in interpreting national income movements in terms of satisfying consumers' wants, the limitation of national income largely to noncasual market-bound activities must be stressed. In this country as in many others where the market is always being extended, the relative importance of the household as a source of consumer goods is declining. Many activities formerly performed by the housewife or other members of the family and not measured (baking, sewing, canning, etc.) have progressively been taken over by business enterprises and gone into market-bound activities; other household functions have vanished without leaving a direct substitute in business activity. Hence, national income totals tend to exaggerate the upward movement in the supply of goods to consumers, if such supply is comprehensively defined as coming from both market-bound and family activities. Likewise, a comparison of the national income of two countries at different stages of the commercialization of family production must take into account the differing importance of the market sphere in the total provision of goods to consumers. The omission of casual activities also imparts an upward bias to the secular trend of national income, since their importance relative to those covered diminishes as more people move to cities and engage in regular, full time, pursuits.

³⁵For estimates of the magnitudes see, for example, *ibid.*, pp. 419-35.

The effect on the interpretation of short term changes in national income is at least as great. During any expansion, whether associated with business cycles or with wars, people move from nonmarket to market areas and from occasional to full time jobs; and in the larger net product the proportion of measurable market-bound activities increases at the expense of nonmarket activities or occasional jobs. As many of us are all too aware, during recent years, when the pressure of war needs for the expansion of market-bound production was especially intense, the number of persons available for family household work decreased materially. *Total* net production, including production within the household, increased much less than production on farms, in factories, shops, and offices. During short term contractions, on the contrary, the shrinkage of the market sphere swells the number of persons available for services both within the household and for casual jobs. Being confined to noncasual market-bound activities, national income is thus a more cyclically sensitive index than a more comprehensive total that would include the large productive sector of the household as well as occasional jobs and pursuits. Variations in it therefore exaggerate short term changes in the more comprehensive total.

We come finally to what some may consider the gravest omission—the deliberate exclusion of the human cost of turning out the net product; i.e., such disadvantages as are concomitants of acquiring an income and cramp the recipients' (and others') style as a consumer. One example would be long working hours. If to turn out a net product of a given size requires a work week that leaves little time for leisure, the producers cannot derive much satisfaction as consumers, i.e., as individuals who have certain wants and preferences. Another example would be the strain some jobs impose. If by and large a task is disagreeable, exhausting, dull, monotonous, or nerve wracking, the cost to the producer as a consumer is higher than when the task is light, instructive, diversified, or amusing. The range of illustrations is wide—from these obvious ones to more tenuous allegations concerning the costs of unpleasant features of the business-urban civilization such as blatant adver-

tising and the ruthless despoiling and defacing of the countryside.

National income is not intended to measure such costs. It gauges the net positive contribution to consumers' satisfaction in the form of commodities and services; the burden of work and discomfort are ignored. And it may well be questioned whether such costs are measurable; or if measurable, could be estimated in terms comparable to those in which net product is estimated. Nor is it easy to say whether the long term trends or short term fluctuations in these costs parallel those in net product or are in opposite directions. Some of these trends are clear. Working hours have been progressively shortened, and many of the heavier jobs, demanding stamina and endurance, are now performed by machinery. On the other hand, it is claimed that the monotony and dissatisfaction to the individual as an individual due to greater specialization and the repetition of a few motions have increased, and that so has the nervous tension. The balance of such claims and counter-claims cannot be struck.

The reason for calling attention to this aspect of economic activity, completely neglected in national income measurement, is its possible contribution toward understanding some of the longer term trends. It warns us against too easy an acceptance of the thesis that a high national income is the sole desideratum in theory or the dominant motive in fact in a nation's economy. The reduction in working hours, the decisions made by countries that discourage as rapid a growth of population and of national product as could be attained (consider immigration restrictions); the willingness of some business men to adopt a policy of live and let live when they might expect a greater net return from vigorous and aggressive competition; the emphasis some individuals put on the importance of other than economic incentives proper—are all indications that both in society at large and among the groups and individuals it comprises definite limits are set upon a maximum net product as measured in national income. Both recently and in the past a potentially larger net national product has been forfeited for the sake of mitigating some intangible costs of the type

illustrated above. Though unable to measure them, we must recognize that their omission renders national income merely one element in the evaluation of the net welfare assignable to the nation's economic activity.

4 *Consistent Valuation*

After we agree upon what to include in national income and what to exclude, the next task is to find a common denominator for the various goods so that we can add them. The thousands of commodities and services must be converted into homogeneous values and added before we can study changes in them from year to year or the shares of various sectors for a given year. The problems that arise in the attempt to devise such a common denominator are perhaps more intricate than any discussed so far: in them inhere all the questions of inclusion and exclusion, but in the more difficult form of assigning quantitative weights (which can range from zero to very large numbers) rather than just marking the items by a plus (to be included) or by a minus (to be excluded).

If the various items included could be measured in terms of some physical property by precise instruments, and if we could agree that the estimates reflect consistently (across time and space) the economic significance of the items, valuation would be easy. But neither *if* is valid. It is in fact impossible to measure the physical properties of the full contents of national income, for the simple reason that some parts have no recognizable physical identity. Thus, even on the most tangible level, i.e., product, national income includes such items as *net* construction or *net* flow of producers' equipment, which are not congeries of physically identifiable buildings or machinery. Moreover, no imaginable physical property of goods could be accepted as in any way reflecting consistently their economic significance, i.e., their importance in terms of costs and returns.

Another simple way to deal with the problem would be to accept market prices at their face value. One good reason for confining national income to products of market-bound activities is the availability of market prices, which surely

approximate the relative economic significance of various goods more closely than any physical property. If we could assume further that market prices reflect the relative economic significance of different categories of goods consistently as between two years or within the same year among distinctly different types of market, consistent, that is, with the input of real resources such as labor and the satisfaction consumers derive from the product, the problem would vanish. All we would have to do would be to find market prices for any given year, weight the various items that enter national income, and add.

The problem exists precisely because market prices are not consistent from period to period, and at a given point of time in different types of market. Prices of a physically identical commodity change from year to year. Even if the change is due to shifts in real costs or tastes, not to a general price inflation or deflation, we cannot use changing price totals and derive a comparable national income series. We still have to use prices at some point of time, i.e., the weights expressing the relative economic significance in a fixed base period. But most price changes over time are due to the general imperfections of our money mechanisms which create widespread movements in the price level. And society itself acknowledges this defect in trying to improve the mechanism and to curb the more extreme variations or trends.

Nor are market prices a consistent valuation base at a point of time. For example, a surgeon charges his private patient \$1,000 for an operation he performs free in the hospital clinic. Such differentials in prices of physically identical commodities and services abound. While they may correspond to differences in the value of the monetary unit to would-be purchasers, a fixed base is as essential for different categories of goods as for changes over time.

These two aspects of the valuation problem—changes over time and differences in pricing bases among several sectors of the economy at a given time—are distinct. Treated differently in the historical development of quantitative economics and of national income measurement, they are kept separate even in the brief discussion below.

The problem of adjusting for changes in prices over time has long been recognized; and the availability of series for many groups of commodities has facilitated statistical solutions. Though difficult questions remain, their character is well known. All we need stress here is that to adjust national income for temporal changes in prices is far more difficult than to adjust any one component. Because of the very comprehensiveness of national income totals, they cannot be estimated directly in terms of quantities, then weighted by some constant prices; and the 'deflation' of the current price totals for changes in prices over time requires price indexes of a comprehensiveness virtually impossible. It is difficult enough to get comparable prices for groups of commodities fairly standardized in quality, such as steel or cotton of specific grades. But when one visualizes the variety of goods included in national income, and the importance in it of services or commodities subject to rapid qualitative changes, the difficulty of 'deflating' the current dollar totals precisely seems insurmountable. National income totals in constant prices are consequently rough approximations, though always measuring net product more accurately than unadjusted totals in current prices.

Although the second aspect of the problem—the differentials in price bases among the various sectors of the economy—has also long been recognized, few statistical attempts have been made to solve it, chiefly for lack of proper data—prices of identical goods in different markets; e.g., prices of meat of the same grade to consumers in lower and higher income neighborhoods; or prices for an identical service paid by governments and by corporations. Rich though our price data are, comparison is possible for merely a few items. Precisely because of the different characteristics of markets, the share of common, identical goods is likely to be small in each, and that of different (though comparable) goods large; hence, for just the categories for which price differentials may be large, prices cannot be compared except through analytical experiments designed to render two qualitatively different goods truly comparable.

Whatever the reason, national income totals, even in constant prices, are not adjusted for differences in price bases of the component sectors. Consequently, the weights assigned components at any given period may be affected by differences in price bases; i.e., the components would be weighted differently were an attempt made to put them on a comparable price basis. And whenever the relative weights of components characterized by different price bases change materially, the movements of national income in constant prices are also affected.³⁶

The far reaching effects of this failure to adjust for differences in price bases may be illustrated by the perennial bundle of problems arising in measuring the share of government.³⁷ Unlike business enterprises and individuals, governments sell most of their services on a compulsory basis—setting the volume, composition, and price by legislative fiat. On the buying side too, governments are not subject to the same rules as private firms or individuals, incurring deficits without the economic penalties attached to them in the world of private enterprise. Government is not unique in this respect—some public utilities also exercise compulsion in their selling and are likewise, for brief periods, immune to the fateful consequences of deficits. But the far higher degree to which government possesses these peculiarities than any other sector of the economy puts several stumbling blocks in the way of national income measurement. First, to differentiate between intermediate and final products of government activity is exceedingly difficult. Were enterprises free to buy and pay for government services as they do coal or services of legal firms, their payments could be considered the value of intermediate services rendered by government. But the government exacts a compulsory price in the form of taxes; and in the organization and accounting of its activities does not separate services to enterprises from those to ultimate consumers. Likewise, were

³⁶See the effect of the attempt to adjust for such price differentials between the war and the nonwar sectors in recent years in *National Product in Wartime*, Part II.

³⁷Some of these could be more appropriately discussed in other sections; e.g., in connection with the distinction between net and gross. But it seemed best to note the whole array of questions at one place in the discussion.

individuals free to buy and pay for services of governments as they do those of physicians or of domestic servants, their payments could be considered the value of the final product of government activity. But the element of compulsion and the difficulty of a functional classification of government activity exists here also.

Second, are the prices paid by government for productive factors engaged under its auspices similar to those paid by business firms to their employees, capital, etc.? Third, should the government be treated like a corporation, and its undistributed profits and losses considered compensation to the factor of enterprise engaged in the government 'industry'?

The mode of settling these various problems will affect the size of national income, its composition, and changes in it over time. As a greater or smaller allowance is made for intermediate services of government, there is a greater or smaller allowance for duplication, with corresponding effects on national income as a net total. If we adjust for the differences between the prices government and business firms pay for the things they buy, we will get one national income total; if we do not, another. If we recognize the validity of the concept of net government savings, national income will be larger when the savings are positive and smaller when the savings are negative. And there will be corresponding effects on the share of government in national income, as well as on temporal changes in both.

The arbitrary solutions given these questions in the national income estimates prepared at the National Bureau in recent years were, in our judgment, the least unsatisfactory for what is essentially an insoluble problem. It was thought that because of the joint character of most government activities (e.g., national defense, provision of justice), services by government to business enterprises cannot be differentiated from direct services to individuals. The simplest way seemed to be to take payments by business firms to government as measuring intermediate services by the latter, thereby including in the calculation of national income (at the payments level) net business profits after all taxes. Likewise, direct payments by individuals

to government were taken to measure final services, i.e., services by government to individuals as ultimate consumers. This meant including in national income (again at the payments level) all payments to individuals, gross of direct taxes paid by them.

Differences between the prices paid by government for the goods it purchased and those paid by other sectors of the economy were not adjusted for, except in the case of war products in *National Product in Wartime*. This is in line with the failure to make similar adjustments for price differentials among other sectors of the economy (e.g., between pricing on farmers' and on urban industries' markets).

Finally, it was deemed consistent to treat government as if it were a business corporation, and allow for its net savings or losses. This is tantamount to measuring the total value of government services by the taxes paid for them, rather than at cost—a basis exactly parallel to that applied in valuing the total output of other industries in the economy.

These answers leave plenty of room for doubt and contention,⁸⁸ and as the character of government activity changes and its functional characteristics are better analyzed, a less arbitrary approach may become feasible. But the essential difficulty will remain, viz., governments (and related semipublic sectors) and the private business sectors (both firms and individuals) do not and cannot operate under the same rules, any more than do or can the business and what may roughly be called the family sectors. The difficulties in handling the latter are reduced by excluding it almost completely from national income; but national income includes both the private business and the public sectors. The fundamental difference in the principles on which these sectors operate means that some arbitrary decisions will always be called for in order to put the two together—

⁸⁸For extensive and repeated discussion of these problems, see *Studies in Income and Wealth* by the Conference on Research in Income and Wealth, particularly Vol. One (1937, pp. 175-248); Two (1938, pp. 269-342); Three (1939, Preface); Six (1943, pp. 1-44). For modification of the assumption in war years see *National Product in Wartime*, Part I.

by applying the private market or public economy base to both, or by devising some common denominator.

Though the bearing of differential pricing upon international comparisons of national income is obvious, we cannot end without stressing it. Differences in price bases among the several sectors of a nation's economy reflect differences in institutional characteristics and principles of operation. Even an industrially advanced nation with a democratic social system cannot be described as virtually one free business market. If the family and its economic life is omitted, there is still the farm sector, the public utility, the government—each with its peculiarities. When we consider more than one national economy, differences in the relative importance of various sectors within each are perhaps most prominent. Failure to adjust for price differentials among the several sectors in each country means that international comparisons cannot be made properly unless it is assumed that the relative distribution of national income among these various sectors as well as the extent of the intra-national price differentials are similar. Obviously, such an assumption is not valid. Hence international comparisons of levels, composition, and even changes in national income cannot be sound until some advance has been made toward adjusting for price differentials within each country. The customary basis for international comparisons of national income, exchange rates or market prices for a few commodities, is obviously so crude that only the biggest differences can be deemed significant.

5 Directions of Future Work

We have discussed some problems in the definition and interpretation of national income and of related totals, merely noted others, and not even mentioned quite a few (e.g., in measuring *national* income what constitutes a 'nation'; types of allocation, such as by industrial source). The reader may well be disturbed by the contrast between the quantitative definiteness of the estimates in Parts I-III and the challengeable character of the assumptions upon which they rest. Our critique of the bases of estimates may easily create the impression that they are shifting sand, and that the edifice built on them, with its impres-

sive structure of quantitative precision, is unsound, a precarious indicator of the net contribution of the economy; indeed, that while judicious and cautious use of the estimates might serve a purpose, their appearance of finality and accuracy is likely to offset this service, so that it would be better to abstain altogether from such assessments, or at least to restrict them to academic cloisters.

Such counsel of despair is hardly warranted. First, we have harped upon the thorny problems and moot questions in national income definition and interpretation to the neglect of the wide sectors and many aspects that can be defined simply, measured properly, and interpreted easily. Second, agreement on certain basic assumptions, e.g., that concerning goals of economic activity and the corresponding distinction between gross and net, and the limitation of economic activity to narrower boundaries than all activities leading to the satisfaction of individuals' wants is widespread. Alternatives were discussed in order to ensure awareness of the character of the underlying assumptions and to caution the reader not to stretch the estimates beyond their bases. Third, if these assumptions concerning goals and the distinction between economic activity proper and life in general are accepted, the remaining questions are often of minor quantitative import. Except in years of violent changes and shifts (such, for example, as those of a major war) temporal changes in price can be tolerably well adjusted for; price differentials do not shift violently from year to year; the share of government and other nonfree market sectors is small, no matter how measured; illegal activities and transfers can easily be excluded, and the boundaries of a nation as an economic entity set. Of the remaining problems, some are theoretically not soluble, but even highly arbitrary solutions can have no more than a minor quantitative effect on the national income totals and their distributions.

At any rate the choice is not between retaining national income estimates and discarding them; and it is not even between not having and having widespread public discussion of these and related estimates. Society has always needed and searched for a commonly agreed upon yardstick by which to measure

the success of its economic activity; the demand for such a yardstick became more intense as economic success was given a high place in the scale of social values, and sharp fluctuations occurred in economic activity. National income has not always been that yardstick. In this country before 1900, national wealth estimates were more numerous than national income—possibly reflecting the race to accumulate capital and attain an adequate level of industrial capacity. But in recent decades national income, with its emphasis on current contribution to both consumers and capital accumulation, has been used increasingly as the most convenient measure of economic progress, of even short term fluctuations. The more the estimates are so used, the greater the likelihood that they will be widely discussed—and properly so since their significance for public policy lies in widespread agreement concerning their underlying assumptions and their suitability as criteria of economic achievement. In an authoritarian regime national income could be made taboo as a subject of public discussion and the concept declared illegal or defined by dictatorial fiat. Its free acceptance in a democratic society gives it meaning as an appraisal based upon widely accepted criteria tested by discussion.

The choice is then between (a) letting national income estimates be taken at their face value and misinterpreted because of incomplete awareness of the underlying assumptions and (b) attempting to have them used and discussed in terms of their relevance to this or that specific problem or issue of public policy in full cognizance of the assumptions upon which the concept rests and the compromises in measurement forced by lack of data. There is no question of discarding them because they may be misused. The alternative is between trying and not trying to ensure their intelligent use. Critical probing of the basic assumptions and exposition of the limitations of the estimates, despite the acute intellectual discomfort entailed, serves both to encourage the valid use of the estimates and to indicate the directions of further investigation.

So far, national income measurement has been most successful in recording the contribution of the business area, least in the public and family sectors. Future study lies largely in the

latter—both within a single economy and for several—because international comparisons cannot mean much unless the relative weight and relations of the three sectors in each economy are known.

The public sector especially should be analyzed more carefully and in greater detail. Government activities must be classified functionally, the comparative pricing of factors or products in government and private spheres reviewed, government current and capital expenditures differentiated. Taking total government expenditures on goods gross, as the Department of Commerce does, is useful for some immediate purposes but does not solve the cardinal problem of measuring the government's share in the *net* product of economic activity. Study of the different types of relation between the government and private spheres in different economies will reveal major problems and facilitate the development of common bases upon which activities in the private and the public sectors can be consistently measured, compared, and combined.

The family sector also should be studied more thoroughly. The interest in recent years in the size distribution of income among individuals and households and in consumers' expenditures is a step toward linking the family and business sectors. As these studies of size distributions and of consumption-savings patterns progress, it will become increasingly possible to take account of household nonmarket activities of an economic character; to extend national income estimates over more of these nonmarket activities; and to adjust dollar totals for price differentials among various groups of consumers. Again, as other countries are covered, the ground will be laid for comparative studies of economic growth and change in national economies differing in social organization.

The more intensive analysis of the government and family sectors will not only add to the reliability of estimates for some components of national income; it will also permit types of allocation not feasible at present. But we should not overlook the other tasks that remain within the framework of the national income estimates as they are currently prepared. The reconciliation of the estimates made by the flow of pay-

ments and the final product approaches, both with respect to the over-all totals and the apportionment between consumption and saving, is one. The extension of measurements to various gross product totals, to a point of approximating the total volume of transactions is another. The translation of estimates for different countries to as comparable a set of bases as is possible with the present data is a third. And there are always the tasks of continually refining the measures, and establishing them for finer classifications and more frequent time intervals.

Much progress will undoubtedly be made in all these directions within the next twenty-five years. Moreover, the estimates will prove more revealing and useful simply because of the mere cumulation of data and experience. Yet we cannot hope ever to resolve fully the conceptual and statistical problems. At any time, conceptual problems in national income measurement are colored by conflicts concerning the purposes of economic activity, the relative importance of various sectors of the economy, and of economic and other useful activities. Unless such conflicts cease, either by suppression or by some improbable stabilization of economic and social life in fixed channels, definitions of national income and its components will reflect compromises made in the interest of consistent and continuous measurement. And such compromises will always be subject to critical scrutiny and to challenge as less good than others for specific uses. Likewise, statistical problems arising from lack of data will continue to hamper the estimator until society becomes more cognizant of the need and takes the initiative in seeing that they are gathered currently. Because of the huge cost of collecting nationwide data, they have been gathered in the past (usually by the government) only when society became convinced that the problems for whose solution they seemed essential were crucial. Consequently the accumulation of data has lagged behind the emergence of problems calling for quantitative analysis. The statistical expedients that will continue to be resorted to and the consequent approximations will give rise, as they should, to different procedures and judgments concerning the reliability of the sever-

al estimates. Some sectors it would be desirable to measure will still be omitted because no procedure for reaching even satisfactory approximations can be devised.

Like all social measurement, national income estimates will never be beyond criticism on the score of reliability or completeness of coverage, or beyond dispute as to the validity of underlying assumptions. But this, of course, is no reason for not using them now, or for not continuing work on their extension and improvement in the future. Despite all their imperfections, the estimates are indispensable for taking a broad view of the economy; and for testing in the light of a record of the past and the immediate present the ever changing theories of economic behavior, diagnoses of economic problems, and pleas for economic reform. It is not unreasonably sanguine to hope that continuation, extension, and refinement of these estimates will assure an even greater contribution to a better understanding of economic life and to a more intelligent handling of the various problems that find their roots in the workings of the economy.

