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TITULO: Appendix: The Concept of Income
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Price Level)

C E N D E S

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APPENDIX: THE CONCEPT OF INCCME

1. Introduction

Income is a simple and generally familiar concept with complex ramifications. Income represents continuing command over material resources; it is a flow of receipts available to purchase net flows of goods and services. Nevertheless, income in a given period is not identical with the sum of all such receipts in that period-it may be either greater or less. It is clear that income should be considered a net concept, and that against receipts should be set an appropriate allowance for the maintenance of income potential, somehow defined. If any identifiable payments have been made whose direct effect has been to help maintain that potential, such as payments for productive services that cooperate in the generation of receipts (via production and scale), then these payments must be deducted from receipts as a step in calculating income. In addition, any change in income potential, such as an increase in productive capital equipment, must be allowed for. It is in the making of this allowance, and in particular in defining "income potential" for this purpose, that difficulties arise.

Two approaches to the problem of defining income potential particularly merit attention. The first concentrates on measurable phenomena-the flows of goods and services becoming available and the stocks of capital and other assets. The second concentrates on long-run potential flows of goods and services, which because of uncertainty are not directly measurable, while giving attention to currently available, and measurable, stocks and flows to the extent that these have a bearing on the former. Each of these approaches will be especially useful in connection with certain problems, and in connection with some problems both have to be used together. The first of these approaches gives rise to the concept of net production, or current income, depending on whether one chooses to look at it in terms of the goods and services themselves or in terms of the claims to their ownership. The second gives rise to the concept of long-run production or income potential, or more

simple, of permanent income. With either of these approaches, income may be considered to be the maximum that could be consumed in a given period consistent with the maintenance of wealth or of income potential. Alternatively, and essentially equivalently, it may be considered to be the sum of the amount that is consumed in a given period and the amount that is added to wealth, or added to long-run income potential. Complexity is minimized in this connection if one uses the former convention, speaking of the maximum that could be consumed consistent with the maintenance of whatever is to be maintained.

Certain other attributes are shared by both the above concepts of income. Meaningful measurement clearly requires that the wealth or long-run potential, as the case may be, that is to be maintained should be valued at a constant general price level, even if income itself is measured at current prices and is not prevented from fluctuating with changes in the price level. That is, real wealth or real long-term potential is to be maintained, not merely its money value measured in changing prices; otherwise the value of income would depend not only on the present price level but also on past or future price levels. If it did, it could not be interpreted solely in terms of one set of values, and its meaning would be correspondingly difficult to specify. This proposition is independent of whether income is to be deflated by a price index so as to be measured in real rather than money terms. In either case it is desirable to omit from income any changes in wealth or capital that are purely nominal, the direct or implicit result of changes in the price level of capital goods. As measured, income for certain purposes may be allowed to have purely nominal fluctuations proportional to the general price level; but nevertheless the rate of flow of income at any instant should not include any element of purely nominal changes in capital values.

This principle is difficult to follow in practice and is not in fact followed by most people who estimate income. They recognize, usually explicitly, that the income measure is often misleading because an inappropriate allowance for the maintenance of capital is being made, the allowance being an arbitrary function of historic costs rather than being true current costs

of maintenance. The practical difficulty of making the appropriate allowance generally bars them from making it numerically; instead they usually state that the error is present and sometimes indicate its order of magnitude.

The above discussion indicates a second attribute shared by both types of income concept. Both may be expressed either in current prices, the level of which varies over time, or in constant prices. In the latter case the only fluctuations in income are real fluctuations, fluctuations in the availabilities of goods and services; except of course for errors of measurement.

A third common attribute shared by both concepts is that it is taken for granted that income has a direct bearing on material welfare. This is true even if money income is considered rather than real income, although in this case its relevance is more limited. It may be used for interpersonal or other cross-sectional comparisons of material welfare but not generally for comparisons over time.

A fourth common attribute shared by the two types of income concept is that, since they are intended to measure material welfare, they are burdened with all the difficulties inherent in the notion of material welfare. Current consumption, actual or potential, is supposed to include those flows of goods and services which directly augment the utility or satisfaction enjoyed by the persons who consume them. All other goods and services, that is, the only other goods and services worth having, are valuable because they contribute to the production of those goods and services that yield utility to consumers. While this distinction is straight-forward in principle, it has to be partly arbitrary in practice. In some cases, such as some expense account items of business representatives, goods and services which are clearly consumption goods and services on any reasonable interpretation are classed as productive and are therefore omitted from the measured incomes of the persons enjoying them. In other cases, such as the costs of commuting to and from work, goods and services that almost certainly are productive, adding nothing to the satisfaction enjoyed by the persons receiving (and paying for) them, are classed as consumption and are therefore included in (not netted out of) the

incomes of these persons.

Several other problems of measurement and definition are shared by both income concepts under discussion. In general, except where the discussion below indicates otherwise, any problem of measurement or concept possessed by one type of income concept is possessed also by the other. Where these difficulties are discussed in detail, they will be discussed in connection with the context in which they are most commonly encountered. This means that most of them will be discussed in connection with net production and current income, since the vast majority of the statistical work done on income has employed these concepts rather than the concepts of long-run production and income potential. The discussion of the latter will primarily concern the problems peculiar to them.

2. Net Production and Current Income

It has long been a conventional simplification, which for many purposes is satisfactory, to regard material wealth as a measure of long-run income potential. This idea is responsible for the use of wealth maintenance as the criterion for determining net production and income in any given period, since there is no disagreement that these should be measured net of payments (that is, of productive goods and services utilized) required to maintain long-run net production and income potential. Broadly speaking a given amount of wealth should represent a given amount of income potential, so that if wealth does not change, and other things are equal, income potential does not either; if this is known to be untrue in a specific instance it may properly be inferred that either the wealth or the income has been measured incorrectly. Therefore, it appears logical, and indeed it is logical if one ignores the problems raised by uncertainty, to use the maintenance of wealth as the measure of the maintenance of long-run income potential.

This simplification enables us to concentrate on measurable, tangible goods and services to a much greater extent than is otherwise possible. Out of the gross quantities of goods and services available in a given period some will clearly be productive in nature and are necessarily contributing

directly or indirectly to the maintenance of capital. In the simplest case imaginable the capital stock at the end of a period would be identical in every detail with the capital stock at the beginning, with consumption during the period equal to net production. If so, the productive goods and services devoted to maintaining capital are exactly sufficient to do so, and business firms see fit to replace or maintain every element of capital in exactly its previous form and quantity. All other goods and services, other than those devoted to maintaining capital, contribute to the satisfactions of consumers. In practice the world is never this simple, even in those rare instances where consumption is exactly equal to net production. Some elements of capital are not kept unchanged or replaced over a period, and some are increased. It is still proper to say that capital is maintained if the value of the increased elements is in total equal to the value of the decreased ones, where both are valued at prevailing prices, since in that case their contribution to long-run income potential is the same.

Furthermore, the amount of productive goods and services will not be exactly equal to the amount required for the maintenance of capital at its previous total value; most years it is greater, and capital increases. Consumption is accordingly less than net production. In a few years capital decreases, and consumption is greater than net production. In either case net production is the amount that would have been consumed if productive goods and services had just been sufficient to maintain capital, given the total volume of goods and services available.

Whatever the amount of net production in a given period of time, it belongs to someone. The claims to ownership of the goods and services representing net production are net current income to the persons possessing these claims. In the view of each person, his net income is the total of his receipts minus the nonconsumption payments required to maintain his wealth other than cash constant. (Such payments include objective costs incurred in the process of earning the income.) Usually his receipts will be cash, which represents generalized claims to ownership on goods and services becoming

available for consumption or addition to wealth. Initially, however, his income is the share of net production which he owns because of the contribution of his productive services to its creation; subsequently he exchanges this for other forms of net production which he prefers, usually by the medium of cash.

The natural tendency of people to pay more attention to receipts rather than accruals tends to obscure the fact that current income and net production are two aspects of the same thing, and that for most purposes the two concepts are interchangeable. Their equality is as inevitable as the equality of the two sides of a balance sheet, and arises for the same reason. The equality of income and production is an equality of flows of goods and services to the claims to them, while the balance sheet equality is an equality of stocks of goods in existence at a point in time to the claims to them. The left-hand side of a balance sheet shows net assets, items of wealth; the right-hand side shows net claims to ownership of those items of wealth. The net assets must add up to the net claims to their ownership, except only for errors of addition and the like. Similarly, total net production must be the same amount as the total claims to its ownership, after due allowance for the maintenance of physical capital, when the matter is viewed from the production side, or for the maintenance of the real value of net ownership claims to that capital, when the matter is viewed from the income side.

Nevertheless, from a certain point of view production and income can be thought of as widely separated and conceptually distinct. Most finished production flows to consumption, where the flow of consumption of goods and services is drawn directly from the capital stock, for the most part; that is, relatively little labor, land, and other productive services are directly involved in the act of consumption itself. Productive services are for the most part engaged in creating capital, including inventories, mostly to replace that which is consumed. Accordingly, the accruing claims of the owners of productive services are in the first instance mostly claims to newly created capital and only indirectly through many intermediaries are claims to final net

production of consumer goods and services. In the act of consumption, the owners of productive services cancel or offset the major part of their claims to new capital, the cancellation or offsetting being effected through the process of exchange.

The intermediary firms through which owners of productive services have indirect claims to final product are engaging in offsetting transactions on capital account; in particular, the final intermediaries providing consumer goods and services are mainly releasing capital, from their point of view, which must be replaced and which to that extent is netted out of their income account. Thus the bookkeeping identity of net product and net income tends to be obscured from view, especially if one pays primary attention to the individual types of transactions, such as ultimate sale for consumption. Similarly, in the actual process of gathering and tabulating national income and product statistics the figures on income payments and accruals are in general obtained from a different set of firms from those reporting for the product accounts; and accordingly, because of differing errors and omissions on the two sides, the two accounts will fail to be exactly equal.

The identity between income and product was first remarked upon extensively at the beginning of the nineteenth century by the French economist J. B. Say, who expressed it by saying that supply creates its own demand. He noted that the community as a whole can always afford to purchase its own total net product, because its total net income is necessarily equal to it.¹ He argued this in protest to the then common usage derived from the point of view of the business intermediaries and final sellers, speaking of "overproduction"

1) These remarks give one of several possible interpretations of Say's point of view, about which there is still some debate. It appears that he himself failed to distinguish between a purely definitional proposition, such as that given here, and a factual one concerning the possibility of depression levels of income and production.

of all goods and services. Since we have not reached that state of bliss in which no one wants more consumption goods or further additions to wealth, he remarked, and since income is always exactly sufficient to buy the whole product, it is nonsense to speak of general overproduction. Overproduction can only be partial, not general. As a pertinent example of his point there might be overproduction of all consumer goods, while people were attempting to add to wealth at a faster rate than business firms had expected or intended to do. Accordingly there would be underproduction of investment goods (other than previously unexpected inventory gains) exactly equal to the overproduction of consumer goods and of inventories.

(These observations have nothing to do with observed regularities in production and sale of goods but are purely definitional, having to do with the choice of language. It says nothing about whether the outcome of the production and exchange processes at any time will be nearly the most satisfactory attainable to everyone concerned, or will be distressingly far from the most satisfactory attainable. We know from experience that the latter can happen.)

3. Components of Net Production

Economically speaking, net production has two components, consumption and addition to wealth. The measurement and accounting of net production are made more complicated, however, by the problems associated with the accounts of the various levels of government and with transactions with other countries.

Expenditures, and the use of resources, by government consist of three types of things: consumption (things having utility in and of themselves and giving satisfaction to individual households), net addition to wealth, and intermediate goods and services (necessary for the maintenance and replacement of existing wealth). The third type, intermediate goods and services, which includes both some goods and services supplied to the private sector of the economy and also the maintenance of such government-owned capital as highways and post offices, is not a part of net product, properly measured.

However, no meaningful separation of government accounts into the three types has been made, either by government statisticians or by outsiders. Accordingly, government is reported as a separate category, in addition to consumption and addition to wealth (in the private sector), and the total of net product is overstated by the amount of the intermediate services supplied by the various levels of government.

An example of the intermediate services supplied by government is police protection. This service is not carried on because of any direct satisfaction or utility it gives to households, but rather is carried on to minimize the various illegal intrusions on our private lives that would prevent us from enjoying the things that we have. Police protection is one of the regrettable costs of having the consumption and addition to wealth that are already counted separately in national product; to include it as an additional part of product is double counting. This point may be seen more clearly if we consider the effect on our welfare, and on the national accounts, if a change of circumstances (such as a serious crime wave) makes it necessary to increase the amount of police protection. The additional taxes we have to pay to finance this, and the corresponding reduction in private consumption and addition to wealth, represent a loss of welfare to the households of the community. As the accounts are now kept, this is not shown, because the reduction in the private sector is offset by the increase in the government sector, keeping the total unchanged. This is true whether product is being measured in current prices or in constant prices; double counting is there in either case.

Protective services of all kinds, including national defense, represent the biggest single element of double counting in the national accounts. Together they absorbed about half the goods and services purchased by government in the United States in 1959, and over 10 per cent of the net national product. A few other government expenditures involve similar double counting, but are relatively small.

As we have noted, the rest of the government accounts are not separated

into consumption and addition to wealth. For many purposes such a separation would be desirable; it awaits the availability of the necessary data.

The total addition to wealth in the private sector is reported in two parts: private domestic investment and net foreign investment. The latter is simply the net balance on current (goods and services) account in transactions with other countries, primarily exports minus imports. Any excess of receipts from exports over payments for imports is an addition to the wealth of nationals of this country.

The reported aggregates of private consumption and investment both include imported goods and services. In effect, the convention is followed that these are "produced" by the domestic economy by virtue of its having produced the exports to pay for them. In particular, an addition to wealth is treated as domestic investment if the physical capital involved is put in place domestically, though it may have been imported. Net foreign investment includes net additions to claims on physical capital put in place abroad (which may have been exported from this country) and net additions to monetary claims on other countries.

Besides the basic distinction between consumption and addition to wealth, net product can be separated into categories by type of product, in different ways according to the problem at hand. For example, consumer goods and services may be divided into the class of those with high income elasticities of demand and the class of those with low income elasticities of demand, i.e., necessities and luxuries. They may also be distinguished according to their short-run elasticities of supply, according to the relative factor proportions used in their production, according to the type of enterprise mainly responsible for their production, and so on.

4. Components of Net Income

Consumer goods and services are scarce, in that people are willing to make definite sacrifices to obtain more of them, and therefore the productive services that produce them are also scarce. In general, the consumer

goods and services and the additions to wealth that the owner of a productive service can command, per unit of the service he owns, bear a close relationship to the scarcity value of that productive service, which in turn is in general closely related to its marginal productivity. This is true of every productive service; the nature of the income generated, and the basis for it, is the same for every productive service and provides no basis for distinguishing between them. From the point of view of measurement and analysis, income is homogeneous, to a first order of approximation, and cannot be divided into components.

In practice, there are several ways to divide income into components, depending on the problem at hand. One long-honored convention is to divide it according to the type of productive service whose owners receive it, where the "types" are defined in terms of certain distinguishing economic characteristics of the services. First, we may distinguish between human and non-human productive services. Outright permanent ownership rights to nonhuman productive services can generally be transferred by sales, whereas these rights to human productive services cannot generally be legally sold. The distinction between human and nonhuman is not an economic distinction per se, of course, and the characteristics of outright salability as against the ability to hire, contract, or lease is of little economic importance, from an analytic point of view. (It can be important from various practical points of view, of course.) This distinction is therefore more a conventional than an economic one.

Productive services may also be distinguished according to whether their supply is directly determined by economic choices or is affected only in incidental and indirect ways by economic choices, if at all. Thus the physical wealth that supplies productive services can be divided into capital and "land"; the supply of the former is the direct result of purely economic decisions (based on relative prices) to reproduce and maintain it; whereas the supply of the latter, correctly interpreted, is incapable of being altered by direct individual action. The land component of a piece of property is its intrinsic superiority, in its best economic use, over alternative pieces

of property employing the same capital in the same economic use; it is the value associated with a location or site as such. Mineral deposits and original soil qualities, which can be exhausted and not precisely reproduced, but whose rate of exhaustion and semireproduction are the direct results of economic decisions, represent an awkward intermediate category between land and capital. There are economic problems in connection with which these distinctions are of central importance; but such problems have little to do with the analysis of income. In connection with income analysis, therefore, the distinction between land and capital is more a conventional than an economic one.

It is also conventional to divide human productive services into labor and entrepreneurship. The latter is responsible decision making governing the organization and conduct of productive processes, for the account and risk (with respect to income received) of the entrepreneur; labor is any physical or mental productive service not involving ultimate responsibility for the organization and conduct of productive processes. This distinction has in recent years been losing its conventional sanction, partly because of the difficulty of applying it to business organizations having salaried management. In any case, it is of little importance for income analysis.

Certain other ways of classifying income are of more interest and importance for income analysis. From the practical standpoint of data collection, it happens to be convenient to classify incomes according to whether they are received as contractual payments or as residual "profits," and in part according to other criteria partly related to some of the ones previously discussed. Contractual payments, express and implied, primarily make up the three categories of wages and salaries, rents, and interest incomes; the first of these is mainly income of labor; the second, of hired or leased properties (including both land and capital); and the third, of money loaned out. Residual, noncontractual incomes are divided into the net incomes of incorporated enterprises and the net incomes of unincorporated enterprises, a distinction of very limited economic interest.

Income may also be classified according to the type of product from which it originates. As in the case of net product, there are different ways, for different problems, in which it may be useful to classify types of product for this purpose. It may also be classified by the stability over time of its source, which conveniently tends to depend on whether the income is contractual or not. These various distinctions and classifications will be useful at times, but are not of fundamental importance. There is no basic classification of incomes, by source, type, or characteristic, as fundamental as the distinction on the product side between consumption and addition to wealth.

5. The Measurement of Net Income

In practice, national income is estimated by summing up the total incomes in various convenient accounting categories. Data on the compensation of employees, i.e., wages, salaries, and supplements such as payroll taxes, are available for a large fraction of contractual wage payments because they are reported to the Social Security Administration in connection with Social Security taxes. Wages and salaries not covered by these taxes have to be estimated in direct ways. Rental and interest income of persons (intermediate transactions between business firms being concealed out) are estimated partly from the amounts of these on income tax returns and partly by indirect methods. The same is true of the incomes of unincorporated enterprises (which include most farms, and include independent professionals, such as doctors and lawyers). Corporate net incomes are estimated from income tax returns.

Enterprise income in general is estimated net of the cost of maintaining capital (wealth) intact. As customary accounting practices, and the tax laws, require each business to do this on its own, ready-made accounting data provide us with national data on net income after provision for the maintenance of wealth. Neither accounting practice nor the tax laws require that these estimates be economically meaningful or accurate, however. A true estimate of depreciation would be what it costs at current prices to maintain total wealth intact. In practice, what is estimated by and

large is what it costs to maintain constant the money value of total wealth, using the original cost of the wealth (rather than at its current replacement cost). Further, for this purpose the fraction of the original value of a piece of property that is lost each year through use and the passage of time is estimated in an arbitrary way having little relation to its true loss of economic value. Occasionally an attempt is made by private researchers to obtain more meaningful estimates of the amount required to maintain wealth constant, but no systematic information on this is available from any source.

The estimates of enterprise income are inconsistent with these general rules, and with the maintenance of wealth approach, in one major respect: all capital gains on resale of property are excluded from income. If a machine is bought at low prices and is later used until it wears out producing valuable products that make it more valuable than its original cost, the resulting gain appears in the ordinary profit figures and in national income. If the machine is sold at a profit before it wears out, on the other hand, the capital gain will in general be excluded from national income. The purchaser, by taking higher depreciation allowances based on the price he paid for the machine, will reduce the national income estimates below what they would have been had the original owner retained the machine and used it in the same way to generate the same true income. Since a large proportion of capital equipment is kept by its original purchaser until all or most of its economic value is exhausted, the main effect of this combination of procedures is that misleading depreciation figures are used.

On the other hand, a serious attempt is made to exclude from net income any element of capital gain on inventories and goods in process, that is, on any capital other than that classified a long-term (depreciable) capital. This exclusion is attempted through the inventory valuation adjustment. The data on inventories are obtained from sample surveys, and the estimates of capital gains are based on price indexes matched as closely as possible to the types of goods involved. The procedures and results will differ according to the type of inventory accounting procedures used.

On the whole the parts of the national income accounts dealing with inventories, that is, the change in inventories (product side) and the inventory valuation adjustment (both the product and income sides), are the most volatile and the most unreliable of all. They change sharply from one period to the next; the estimates frequently are drastically revised in the transition from preliminary to final values.

It would appear that if a similar adjustment were made for long-term capital, the results would be entirely consistent with the maintenance of wealth approach to income estimation. This is approximately correct, but certain reservations must still be noted.

First, capital values and their depreciation should ideally be adjusted not only for changes in the price level but also for variations in maintenance expenditures. Maintenance costs are treated as current expenses and in effect are assumed to be exactly equal to the amounts required to keep capital equipment depreciating at the rates stated in the depreciation accounts. If a firm chooses to alter its maintenance expenditures, however, this will alter the true economic rate of depreciation of the firm's equipment. An important example of this phenomenon occurred during the Second World War. Because of the scarcity of all types of capital equipment for replacement, most capital equipment (including consumer durables, such as automobiles) was much more assiduously maintained than during peacetime. There was therefore a sharp rise in maintenance expenditures but no corresponding drop in the figures reported for depreciation. On the contrary, wartime tax regulations permitted increased allowances for depreciation, for the purpose of stimulating investment by tax incentive. (Also, many purchases of new producers' durable goods were paid for by the government, or were written off as current expenses, and so were not counted as private additions to wealth.) For these reasons, additions to wealth during the Second World War were grossly underestimated. Then, they were probably overestimated just after the war, because of a reduction of maintenance to levels below normal.

Second, as already indicated, even apart from the effect of changes in the price level, no systematic attempt is made to estimate true economic depreciation where it differs from accounting depreciation.

Third, the notion of the maintenance of wealth, valued at current prices, is subject to the paradox of apparent self-contradiction. If the notion is consistently applied in every period, it can paradoxically occur, for example, that after the passage of several periods, during which prices change but ultimately return to their original values, the total of wealth will have obviously changed in spite of the apparent maintenance of wealth at a constant level in each period. This phenomenon is closely analogous to that of "drift" in a price index made up of linked index relatives with different weights in each period. It is discussed further below in section 8, case (e).

6. The Measurement of Net Product

The principal sources of information on production of consumer goods are censuses of business, manufacturing, and agriculture, available only for certain years. Movements outside these years are estimated from other data, such as sample surveys of retail sales. In general, it is necessary to estimate the fraction of total production and sales that go to ultimate consumers as against the fraction going to other business firms to be absorbed in current production, and to government. Wherever the estimates come from a manufacturing or wholesale source, it is also necessary to estimate the final prices to consumers as well. Data from trade associations, sample surveys, and many miscellaneous sources are also employed.

Methods of estimation of private domestic additions to wealth are basically similar to those for consumption. Machinery, equipment, and other obvious long-term investment goods are estimated from production figures obtained from censuses and surveys of manufactures, with adjustments and subtractions similar to those for consumer goods. Inventory changes are estimated from sample survey data. Construction estimates come from a wide variety of sources of differing completeness and reliability.

Data on government purchases of goods and services are derived from government budget accounts by removing transfer payments and grants-in-aid, and by various other adjustments, all derived from the government accounts themselves.

Net foreign investment is estimated from official balance-of-payments data and from other official sources. This figure is estimated both as the balance on current merchandise and service transactions with other countries and as the accumulation of claims on other countries. The former estimate is used for the national accounts.

7. Imputed Production and Market Transactions

Generally speaking, accounting data are relatively plentiful and valuation is relatively easy for those economic acts and transactions that pass through a market exchange process. It is obvious that many flows of valuable goods and services are not exchanged through the market, and it is difficult to place a valuation on them that makes them comparable to goods and services that are exchanged. This difficulty has led official estimators of national income and product to lay down the rule that they would primarily concern themselves only with market transactions, except where this leads to incongruously large omissions from true income and product that are relatively easy to include.

The main exceptions, i.e., inclusions of nonmarket flows of goods and services, are food produced and consumed on farms, the rental value of owner-occupied housing, and the services of commercial banks and other financial intermediaries. The first two of these items are goods and services consumed by the owners of the enterprises that produce them and so not sold or hired through the market. The third item refers to services not sold directly for a price but bartered, as it were, for an offsetting service.

A commercial bank in effect converts illiquid assets into liquid, readily transferable ones, and incurs costs in the process. These costs are covered by the excess of its interest receipts over its interest payments, as the

bank pays relatively little interest on its deposit liabilities. In exchange for its services in connection with deposits, and for their comparative liquidity, it receives these deposits at low interest compared with what the depositor could earn on alternative, less liquid assets. (The bank may also make some service charges, but in practice these are of little importance.)

Now ordinarily when an enterprise receives capital from the public and transfers it to other enterprises, neither product nor income from that capital would be thought of as originating in the firm that passed it on. Hence it is reasonable to follow the general rule that the income and product originating in a firm shall depend only on its net interest payments, i.e., interest paid minus interest received. If this rule were applied to banks, however, their contribution to income and product would be negative, because they pay much less in interest than they receive. From a product standpoint, they must be thought of as supplying deposit services to consumers in exchange for interest not paid on the deposits.

In practice the way this anomaly is handled is to assume that banks supply gross product, or "sales," equal to their service charges plus the difference between their interest receipts and their interest payments. The part of this going to consumers is counted in the consumer goods and services part of national product.

The question naturally arises, are there any other major omissions and anomalies, or departures from an ideal measure of income and product? Even without profound scrutiny and analysis of present income concepts, it can be seen that there are. The main anomalies can be considered under a single heading, that of the allocation of human and other resources between leisure and paid employment.

The direct enjoyment of one's leisure is similar in principle to using one's personal resources to produce goods not sold on the market (such as food produced and consumed on farms). That leisure is regarded by people as valuable is beyond question, since they sacrifice cash income (which they

could obtain by taking paid employment in their leisure time) to have it. Changes in the proportion of their time that is available for leisure (i.e., that is not spent in paid employment) therefore affect economic welfare in the same way as do changes in cash income or in the quantities of material goods and services available.

There are several ways in which leisure may vary. The hours of the working week can be shortened; vacations and holidays can become longer and more frequent; retirement can occur earlier in life. All these changes have in fact been taking place with the passage of time in most countries. These are additions to leisure as this is understood in the normal sense.

In addition, changes can occur in the amount of unpaid productive activity, relative to paid employment. Housewives enter and leave the paid labor force, with offsetting variations in the amount of housework they do; young people prolong their education, staying out of the paid labor force for a longer time. These changes will often not be regarded by the persons involved as changes in leisure but merely as worthwhile changes in the ~~nature of the~~ nature of the work they are doing.

In all these cases of changes in leisure and in unpaid productive activity, the changes in money income that occur are a completely misleading indicator of changes in economic welfare. If money income goes down because of a voluntary increase in leisure or in unpaid employment, the change must be advantageous or the persons involved would not voluntarily have done it. The logical corrective for this problem would be to impute value to leisure in the same way that value is now imputed to an owner-occupied house and to food produced and consumed on farms. An owner-occupied house is credited with the rent it would command in the rental market; food produced and consumed on farms is credited with the sale value it would have to the farmer, if sold. Similarly, leisure and unpaid employment of persons (and other resources) should be credited with the wages or other income they could earn if they entered paid employment.

Corresponding entries should be made in the product accounts. Leisure

enjoyed for its own sake, and those forms of unpaid employment that yield products or services of direct utility, should be counted in consumer goods and services at the valuation just indicated. The income sacrificed by the student in school, and his direct school expenses, are primarily investment in future earning power, however; they should accordingly be counted in addition to wealth. (The using up of existing human resources with the passage of time should be counted as depreciation, as a partial offset to this.)

As all the suggested imputations could be made with an accuracy comparable to those now being made, by using prevailing wages for the services of the persons whose leisure is to be valued, it is surprising that little has been done about them. One possible reason is the difficulty in handling those year-to-year changes in "leisure" that are not comparable to the ones being discussed here, e.g., unemployment. If a worker is dismissed or laid off from his job, at a time when this is happening to many others, both the value to him of the spare time this gives him and the wage he could expect to earn if he persisted in seeking employment will be much less than at a time of normal, prosperous employment conditions. Similar problems exist in valuing the time of workers on strike. Equally difficult problems are in fact disposed of in one way or another in the current national income estimates, however, and presumably these could be also.

8. Some Complex Problems of Imputation

The problems of imputation that have been discussed so far have the comparatively simple solution of comparing a nonmarket good or service with an identical market one, for purposes of valuation. Several other problems of imputation exist that are not so easily solved, usually because a direct market comparison is difficult to find or is nonexistent. The solution in principle to these problems is to make indirect or residual comparisons of the values of other goods in association with the things to be valued, or in some cases to estimate what the relevant market comparison would be if it existed. Examples of these problems are discussed in the next six subsections.

(a) Instrumental Goods and Services Mislabeled as Consumer Goods and services. Many goods and services are purchased by consumers, and are counted as consumption in the national product estimates, that very well may in whole or in part be instrumental goods and services yielding no utility. For example, time spent commuting to and from work is not the same thing as leisure time spent at home, or spent on a Sunday drive, and the cash expenses of commuting do not have the same effect on the consumer's welfare as money spent on entertainment. In general it may be expected that a person would accept a lower-paying job if it involved less commuting time and expense, and was in every other respect identical. Direct evidence of this is the lower level of rents and residential land values in suburbs than close in to cities; the person closer in must sacrifice income, in effect, by paying a higher rent or a higher price for a house. Accordingly, commuting costs should be deducted from income, and commuting time should be deducted from leisure, in whole or in part.

Corresponding to this, the person who lives close in should have deducted from the estimate of his true income the extra rent he pays in order to save time and expense commuting to work. This extra rent does not represent additional satisfaction but is an offset to a saving in other expenses.

The difference in rents between the suburbs and the city will reflect not only differences in commuting costs but other factors as well. These other factors represent a second example of the distinction between instrumental goods and consumer goods, which arises because some goods can be bought only in bundles, not separately. Living in the city permits closer access to some goods than in the suburbs and the country but also requires paying higher transportation and distribution costs on goods originally produced outside the city. Thus some prices of goods of a given utility will be higher, and some lower, in the city than in the country. The balance is on the side of higher cost in the city. (Also, the environment in the city is intrinsically more pleasant than that in the country to some people, and just the reverse to others. See case (c) below.) Generally speaking, a peach or a tomato sim-

ply cannot be bought in the city without including some transportation and distribution that they do not possess on the farms where they are produced.

These differences in cost do not produce differences in satisfaction from a given amount of the good consumed; they are simply part of the cost of living and working in one place rather than in the other. When a person moves from the country to the city, he generally earns a higher income; but this is in part offset by the higher cost, on balance, of a representative bundle of identical consumer goods in the city than in the country. This difference in cost ought properly to be deducted from the estimate of income.

(b) Consumer-goods Elements in Conditions of Employment. Just as some things labeled as consumer goods are instrumental goods without intrinsic utility, so also some instrumental goods (e.g., human services as employed under a particular set of conditions) have a consumer-goods aspect that is generally not accounted for. This is true whenever a job had incidental benefits for which the employed person would be willing to pay if he had to. The classic example of this is that of the Kaiser's lieutenant. It is said that when the Emperor of Austria went to the opera, he was accompanied by one or the other of two aides. One of them enjoyed opera very much; the other detested it. The first would gladly have paid for the occasions he was asked to accompany the Emperor to the opera; the second would have paid to avoid them.

Similarly, many jobs have particularly pleasant or unpleasant characteristics. A moderate amount of job-connected travel to worthwhile places would be considered by most people to be an advantage; continuous travel probably would not. Some jobs involve unusual danger or other unpleasantness, for which extra compensation must be paid to get people to do the job. Some jobs include very obvious elements of income in kind, such as restaurant meals and entertainment on an expense account. (Some of this is already given an imputed value in the national income, e.g., employee meals supplied by the employing firm as part of the wage.)

(c) Investment-goods Elements in Conditions of Employment. Besides the possibility that a job offers amenities of a consumer-goods nature, there is the possibility that it partly represents an investment to the person holding it. This will be true, for example, if the job he holds has excellent chances of promotion, or otherwise prepares him for an increase in income, and where because of this he accepts a lower current income than he could otherwise obtain. This circumstance is essentially the same as that of the addition to wealth involved in education and should be handled in the same way. (Here, however, a relatively small part of one's potential current income is sacrificed, rather than all or most of it.)

(d) Environment as a Good. Many aspects of the environment will make one place more attractive in which to live and work than another. An obvious example of this, frequently mentioned in discussions of income, is difference in climate; in a mild climate less expenditure on fuel is needed for heating homes and factories than in a cold climate, and people are more comfortable. Another example, mentioned earlier, is the relative attractiveness of living in the country or the city.

This does not necessarily imply, however, that an imputation should be made for differences in climate and the like. A tendency for people and for enterprises to crowd into the more attractive areas will be reflected in higher site rents and hence included in national income. To the extent that workers accept lower wages to work in the more attractive areas, this also will be reflected in higher site rents or "profits" (which sometimes include a rent element), as will differences in fuel costs.

One possible exception to this general rule merits consideration, however. Productive services are not generally mobile between countries, and their prices are not "equalized" because of barriers to trade, so that a comparison of income between the two countries may need to take account of differences in attractiveness of the climate (and other such factors). Here the rents for properties comparable in every respect except the climate will generally not differ by an amount that reflects the differences in advan-

tages of living in the two countries; and an imputation would ideally be made for this.

(e) Capital Gains and Speculation. Generally speaking, it is desirable to exclude from income any purely nominal changes in wealth due to changes in the price level. That is, realized capital gains are generally not income arising from claims to current production and therefore not income in the sense used here. However, some capital gains do arise from what is a productive activity, e.g., from speculation that transfers goods from consumption at a time when they are plentiful and cheap to consumption at a time when they are scarce and expensive.

This may be illustrated with an example using two commodities A and B. Suppose that the producers of these commodities own fixed inventories totaling 1,000 units of each commodity, regardless of prices and the volume of sales. When period-to-period price fluctuations (and fluctuations in sales) occur, the exclusion of capital gains implies that no entries will be left in the income account that arise from capital gains and losses on the inventories. Over a series of periods, it would not matter if they were, as long as inventories are held constant and prices ultimately return to their original values. In this case the total capital gain over the series of periods would be zero, so that the only effect it would have on income if capital gains were counted as net income would be that income would be redistributed among periods. Total wealth would be correctly stated as unchanged for the series of periods as a whole, in either case.

Now suppose that a successful speculator enters the picture, Mr. J. Mr. J knows how to forecast the price changes of commodities A and B, occurring, say, because of foreseeable changes in supplies of raw materials. In period 1, suppose that each commodity's price is 100; but Mr. J foresees that in period 2 commodity A will sell at 133 and commodity B at 67. He therefore bids up slightly the price of A, reducing its consumption and obtaining some new inventories (additional to those owned by producers of A); and he arranges with producers of B to lease from them some of their owned invento-

ries, at a fee compensating them for doing without their physical presence from period 1 to period 2, which he then sells at a slightly reduced price, inducing their consumption. If he does these things for 10 units of each commodity, total inventories are unchanged, but are now made up of 990 units of B and 1,010 units of A, both valued at (about) 100 per unit.

In period 2 Mr. J's price expectations are borne out. He then sells off his 10 units of A, slightly reducing the tightness of its supply and increasing its otherwise constricted consumption, at a profit (capital gain). Since the price of A is about double that of B, he can apply the total proceeds of sale to buying 20 units of B, which is in plentiful supply, causing a slight reduction in its otherwise increased consumption; 10 units of these he uses to return to producers as per his "lease," and the other 10 are approximately his profit in this period. As he expects prices to return to their original levels in the third period, he now leases and sells 10 units of A, as he had done with B before, and he purchases 20 additional units of B, both changes producing changes of the same size in consumption. None of these actions in period 2 alters the total of inventories, as valued in prices of period 2; his total sales for consumption of 20 units of A are just equal in value to his purchases and addition to inventory of 40 units of B. As a result of his actions 990 units of A and 1,030 units of B are carried as inventories into period 3, when prices return to 100 for both commodities.

At equal prices for A and B, Mr. J can sell 20B to obtain 20A (altering total consumption by these amounts). After returning the 10 units of A that were "leased" to him by its producers, he owns 10 units of each commodity, which are his profit (except for his expenses, which for simplicity. I assume are negligible). Total wealth has been increased to 1,010 units of each commodity, and prices are the same as they were in period 1. However, when capital gains are excluded from income, each of his operations is deemed to have maintained wealth constant. The wealth of each period was held constant at the prices of that period; Mr. J's creation of new wealth occurred only by virtue of his having transferred some consumption of each commodity from a period in which it was relatively plentiful and cheap to a

period in which it was relatively scarce and expensive. Such transfers result in capital gains.

Similarly, Mr. J would have incurred capital losses had he bought dear and sold cheap; and there would be a corresponding destruction of wealth not recorded in the income (and product) accounts. The paradox would then occur that wealth was reckoned to have remained constant, in the calculation of net income, yet wealth would be less in the third period than in the first, valued in the common prices of the two periods.

To the extent that wealth is created or destroyed by the transfer of consumption from one period to the next (i.e., by changes in inventories carried over) this is on a par with any other creation or destruction of wealth, and ignoring it ought not to be considered consistent with the maintenance-of-wealth criterion for defining income. On the other hand, apparent changes in wealth arising from price changes affecting given (fixed) inventories are not changes in wealth at a single set of prices, such as current prices. It has been shown, however, that these two statements are contradictory.

The problem posed by capital gains would seem to be the more complicated because in practice there is no way to distinguish between speculation and the holding of stocks to facilitate current production. Producing enterprises do in fact vary the quantities of stocks held, thinking of it not as speculation but as prudent management. In general, if their foresight is comparable to Mr. J's, they will vary stocks, and cause consumption to vary, in substantially the same way he does. Consequently capital gains from successful speculation will be associated with purely nominal capital gains and will be indistinguishable from them in any specific instance.

Finding a solution to this problem requires some reflection on the measurement of changes in wealth. Apart from a physical addition to wealth, a change in the total market value of existing wealth may occur (1) because of a change in the general price level of consumer goods, (2) because of a change in the rate of interest and in the marginal productivity of capital,

(3) because of a change in the relative prices of consumer goods. There is no question that a change in the market value of wealth due to a change in the general price level of consumer goods should be excluded from income and from addition to wealth in current prices. It is also clear that a change in the market value of wealth due to a change in the rate of interest should be excluded from income. If after a certain point the marginal productivity of capital falls sharply, the community is definitely worse off, and in a relevant sense has less wealth, than if the marginal productivity schedule for capital remains high, being otherwise identical over the range of the existing quantity of capital. Since in the former case the market value of wealth would rise because the rate of interest would fall, and in the latter case it would not, counting the rise in the market value of wealth in the former case as income and addition to wealth would be highly misleading and inappropriate. All that remains to be considered, therefore, is a change resulting from a change in the relative prices of consumer goods.

Such a change is what was involved in the cases of commodities A and B, in which Mr. J speculated. He had altered the composition of inventories toward a relative increase in the amount of that commodity whose relative price was about to rise, and a reduction in the amount of the one whose price was about to fall. The subsequent change in relative prices, operating on this change in inventories, increased the total market value of wealth. (The example was set up in such a way that the supposed change in relative prices would have produced no change in the total market value of the original inventories existing before his intervention.)

Now consider the more general problem of whether a change in the market value of wealth from this cause should be considered a true change in wealth, valued in current prices. Suppose that for entirely fortuitous reasons a capital-intensively produced commodity, commodity C, rose in price from 100 to 133, while commodity D, produced with little capital, fell from 100 to 67. When both commodities originally had the same sales volume by value, a base period weighted price index would be unaffected by this change. Since C is produced more capital-intensively than D, however, the value of wealth would

change.

In the case, the result is entirely reasonable if we consider the change in wealth to be a genuine change. If the community is fortunate enough to have relatively much capital tied up in the production of a commodity that has become more scarce and valuable, and relatively little tied up in the production of a commodity that has become more plentiful and cheap, then its total capital will in fact generate more income than before. There is no paradox in letting this change in wealth be counted in income and addition to wealth.

In fact, where the change in relative prices has been unexpected, the changes in marketable wealth will be offset by opposite changes in other resources. Where education and other net additions to human productivity are accounted for in income and addition to wealth, as it has already been suggested that they should be, the relatively larger losses of income suffered by noncapital resources (which are used relatively much in the production of commodity D, since by hypothesis it is the opposite of capital-intensive) should be fully reflected in income and in addition to wealth in a way exactly symmetrical to the treatment of capital wealth. Wholly unexpected changes in relative prices would therefore produce no change whatever in the total of all kinds of wealth, if all kinds of resources are treated symmetrically in the ways that have been suggested here.¹

Therefore the only time that a change in total wealth will result from a change in relative prices will be when resource patterns have been deliberately altered in anticipation of it, as in the case where Mr. J took a long position in one commodity and sold the other one short. It follows

1) This discussion ignores national gains and losses from changes in the terms of trade in international exchange. Such changes will create capital gains and losses that quite properly should be counted in national income, and they would be under the rule suggested here.

that an appropriate way to distinguish between nominal capital gains and those that should be counted as income and addition to wealth is to include in the latter only those capital gains that result from changes in the relative prices of consumer goods, and in the former those that result from changes in the general price level of consumer goods and from changes in the level of interest rates. Similar treatment is indicated for gains and losses in value or in prospective income-generating power of other resources, such as land and human resources.

(f) Conventional Goods, Differences in Tastes, and Interpersonal Subjective Effects of Consumption. It may be said in anticipation of the next section that most problems of valuation and imputation are solved by taking values at the margin, given the quantities available. These values at the margin apply uniformly to all persons and enterprises engaging in transactions in the goods involved. Values attached to "intramarginal" or "extramarginal" units are not considered.

A possible exception to this rule concerns goods consumed by conventional necessity, where the consumer himself in some cases gets no satisfaction from them. A man may not particularly enjoy being clean-shaven, for example, but feels he has to be. In a society that was wholly indifferent about this, some men would take the trouble to remain clean-shaven and some would not; for the latter, the time and out-of-pocket cost absorbed by shaving are instrumental goods to other people's consumption rather than consumer goods, and should ideally be deducted from their estimated net incomes.

One might here argue the contrary view that the prevailing convention should rule as to whether a good is intrinsically desirable or not. If most people in the community feel definitely better off when nearly all the men are clean-shaven than when they are not, then it adds to consumer utility for a man to shave whether he himself likes it or not. In so far as being clean-shaven is required for this job it would be double counting to treat his shaving as a consumer good, just as it is double counting to count as consumption the cost of commuting to work. The handling of this case has

been outlined in case (a).

A more serious objection is that it is hard to distinguish between cases where we conform to custom gladly and those where we do so without enthusiasm. The distinction can be made in principle, however, in terms of what we would do if other people were wholly indifferent about our choices regarding the good in question. Many examples of this are familiar to all of us, of which the problem of "keeping up with the Joneses" is only one of the most talked about.

From the standpoint of positive economics, there is little difference between cases where one person's consumption pattern attracts other people's approval or disapproval for the subjective reasons of custom and tastes, on the one hand, or for more objective and universally agreed reasons, on the other. For example, little or no economic basis can be found for distinguishing between most people's unfavorable reaction to the nuisance caused by jet-engine noise around an airport and some people's disapproval of jet air travel because they think it wicked and unnatural to travel so fast. Again, the ill feeling some people get in a crowded elevator if several men therein are smoking cigars is not economically distinct from the irritation some people feel when they see a woman smoking a cigarette while walking down the street.

In many cases, external economies and diseconomies of production and consumption are automatically reflected in the national income and product estimates. Jet noise around an airport or the smoke emitted from a factory tends to depress surrounding property values and rents; an attractive public park will tend to raise surrounding property values and rents. Here the changes in rents translate into measured income the external economies and diseconomies involved.

External economies and diseconomies of consumption connected with differences in tastes, social custom and the like are not translated into measured income in many cases, however. The costs to an individual of grudging conformity, and the costs to others and himself when he does not conform,

are generally not reflected in income because the community and its markets do not offer alternative places to live and work in sufficient variety for everyone to escape the costs or to translate them into higher and lower rents.

An accidental exception, in part, is the consumption of alcoholic beverages and tobacco. Since the consumers of these goods tend to have mixed feelings about the benefits of doing so, and since their consumption attracts vigorous disapproval from a very vocal and effective minority, legislatures have found it politically easier to levy excise taxes on alcoholic beverages and tobacco than to levy other taxes, such as income taxes. By chance, for entirely arbitrary reasons, excise taxes are not included in national income and in net national product "valued at factor costs"; an increase in excise taxes offset by a reduction in income taxes therefore reduces the measured value of national income, other things equal. To the extent that the excise taxes on alcoholic beverages and tobacco correctly measure the offense given to other people by their consumption, it may therefore be said that this particular external diseconomy of consumption is translated into the measure of national income. (Similar reasoning does not apply to most other excise taxes, however.)

If some external economies and diseconomies are automatically translated into differences in income, a case can be made for imputing values to all of them and adjusting income accordingly. This is not a proposition based on ethics but one that follows from the desirability of consistency in the treatment of essentially similar things. It might or might not be thought ethically significant that carrying out these imputations would result in showing lower economic welfare where social pressure and intolerance in economic matters (e.g., consumption) are present than where they are not, for given differences in tastes (or where differences in tastes are considerable, for given patterns of social pressure and intolerance).

(g) Summary, Further Remarks, and Conclusions on Imputations. A great many things, both tangible and intangible, have the characteristic that in their presence either people are willing to sacrifice income or they require

additional income. In general, this provides a basis for placing a value on these things for measurement of true income from the point of view of economic welfare. If two jobs are similar in every relevant respect except the one aspect whose value is to be estimated (such as commuting time and cost), the difference in wages for the two jobs provides us with an estimate of the value of this aspect as an advantage or disadvantage of the job which has it. This is a residual method of estimation.

Direct estimation is possible only where the thing or aspect to be valued is sometimes bought and sold in its own right, as for example is the case with the rental value of owner-occupied homes and food produced and consumed on farms. (An arbitrary valuation that seems reasonable, but has no market basis, may also be made, as is the case with the imputation for financial intermediaries.) Residual estimation makes possible a whole range of imputations that could not otherwise be carried out, because the things to be valued are in the nature of the case tied as complements to other goods and services.

Direct estimation is possible for the valuation of transportation and distribution and some other cases of instrumental goods now counted in consumption, some cases of consumer goods that are part of the conditions of employment, and true economic depreciation. Residual imputation is required for most instrumental goods now counted in consumption and for most consumer and investment goods that are part of the conditions of employment.

More complex imputation procedures are required for the income element of capital gains. The steps in estimating the income element of capital gains, after adequate adjustments have been made for true economic depreciation, would be (1) to deflate the proportionate change in the market value of previously existing wealth by the proportionate change in an appropriate index of the prices of consumer goods, and (2) to deduct from the remainder the total change in capital values that is the result of a change in the level of interest rates. The balance remaining after these adjustments is the true income and addition to wealth element in capital gains.

All the imputations mentioned up to this point in this section have the element in common that existing market prices are to be used as the basis for imputation. This is the rule generally followed in the national income and product accounts, and in other cases where the total of a product or class of products is to be valued. That is, every loaf of a given kind of bread sold under given conditions is valued at the same price (the price at which it is sold), even though, for example, if less bread were sold that smaller amount would command a higher price. In doing it this way we ignore consumers' surplus and producers' surplus and value everything at the margin.

There is no pretense that even approximately this procedure measures the contribution to income and product of each good and service on an all-or-nothing basis; that is, the procedure followed tells us nothing about how much better off we are to have a given good or service than we would be if we did not have any of it at all. Indeed, trying to measure this latter all-or-nothing value would be pointless as far as income and product accounts are concerned. Although we would be willing to allocate more of our incomes to any one product than we now do, if necessary, in order to avoid going without it altogether, we could not possibly simultaneously allocate a larger share of income to everything (including additions to wealth) at once. As income and product must add up to the same total, the only problem is how to allocate it among its component parts. The marginal rule, i.e., valuation at market price, is far and away the simplest one to follow and is the only one worth considering in most cases.

A possible class of exceptions consists of those cases where an all-or-nothing situation does exist, that is, where the market does not afford everyone the opportunity to buy as much or as little of a good or service as he likes. In such a case valuation at the price he pays is actually in conflict with the marginal rule, since the price he would be willing to pay for a little more (or would accept for giving up a little) of the good or service is significantly different from the average price paid for the amount bought. Here the argument in favor of the marginal rule is an argu-

ment against the use of market price; and consistency in the overall methodology calls for an adjustment for the discrepancy.

The most important example of this kind of thing arises in connection with external economies and diseconomies of consumption and with the unmeasured consumption element in different environments. These are identical problems from an economic point of view. We wish to place a value on a difference in climate, be it social or meteorological, where the community and its markets do not afford the opportunity to make unlimited choice among the alternatives considered. It offers only a relatively small range of all-or-nothing bargains. Hypothetical controlled experimentation, which in practice means an arbitrary "reasonable" valuation, or possibly extrapolation of value differences from actually available alternatives, offers the only solution. Methods as tenuous as this are already employed in some parts of the income accounts; in particular the imputation for financial intermediaries has much in common with the problem now under discussion. Where this is done the problems and magnitudes involved can always be openly stated, so that those persons dissatisfied with the procedures can rework the data to their own specifications.

If all the imputation suggested here were made, national income and product would be reported as a larger figure than is now the case, primarily because of the imputed value of leisure. A way of keeping this within bounds, without significantly affecting the meaning of the results, would be to make the allowance for leisure by adjusting actual employment to a standard work week, such as forty hours. For all persons with less than forty hours paid employment per week, such as most students and housewives, an imputation would be made for what they would have earned if they had been paid for forty hours work per week. For all persons working more than this, a deduction from income would be made for the imputed value of the leisure lost.

The overall result would be a national income and product total only moderately larger than the one calculated by present methods, say about 40 to 50 per cent larger. This would have no very great significance by itself;

it would merely make explicit the mental adjustments and qualifications we now make on ordinary income figures. It is the changes in income over time, especially the decade-to-decade changes, and the international and inter-regional comparisons that would be significantly affected. Comparisons of economic welfare of several different kinds would become more accurate and meaningful.

9. Permanent Income and Production Potential

The distinction between permanent income and current income, and between the corresponding production concepts, is illustrated by the Biblical story about the seven good years and the seven bad years. A community with leaders gifted with foresight stored up grain during seven years of unusually good harvests and was thereby enabled to live reasonably well during seven subsequent years of crop failure. Current income and production were unusually high in the first seven years, unusually low in the second seven. Because of their foresight, however, the community's leaders were under no illusions about the level of living they could afford to enjoy while the harvests were good.

During the years when they were storing up grain, their tangible wealth was increasing; but their true wealth position was not improving because the coming crop failures were getting ever nearer as the supplies increased. From a long-run point of view, therefore, their production potential and the amount they could prudently consume were no higher during the seven good years, nor any worse during the seven bad years, than at other more normal times. It can be said that their permanent income and production potential were constant over the whole period. It can also be said that their true, or permanent, wealth was also constant, except in so far as they may have made additions to wealth that remained after the seven bad years.

Assuming its consumption followed the same pattern it would have followed had all the years' crops been about average, it can be said that this community's addition to wealth was no different, year by year, from what it

would have been in that case. Apart from transitory changes in consumption, the delimitation of the permanent component of total current income is equivalent to the delimitation of the permanent component of total current additions to tangible wealth.

This delimitation is generally not so easy as in the example of the seven good years and seven bad years. Our foresight is not as good as was that of the community leaders in that ancient example; a considerable range of uncertainty surrounds our estimates, as individuals and as a community, of how much we can expect to earn and produce in the long run. To the extent that we wish to base our consumption on our long-run prospects rather than on our current income, however, we are obliged to make the best estimates that we can. It is evident from actual experience that people are making these estimates and are determining their consumption accordingly; to the extent that this is true, it helps to explain actual consumption behavior if we can successfully estimate what they estimate their permanent incomes to be.

The use of the adjective "permanent" for this concept of income does not imply that estimated permanent income never changes. Permanent income is the estimate at any given moment of long-run income potential, given the resources available at that moment. Income in this sense is the maximum rate of consumption that could be maintained permanently; and if one does not choose to consume at this maximum rate, choosing to add to wealth instead, this increases the permanent income of future periods. Besides such deliberate, intentional changes in permanent income, changes occur because of revisions in long-run expectations, as a result of new and unexpected experience.

For example, a farmer will generally have a fairly accurate idea of the crop yields he can expect to get from his land on the average. He is able to recognize an unusually good or bad year for what it is and will in general let such a year be reflected much more in his additions to tangible wealth than in his consumption. A series of very good or very bad years, compared with his previous expectation, will probably result in a revision

in his expectation, however. He is unlikely to be so sure that the climate never changes, and that his understanding of the climate is so perfect, that his expectation is completely unaffected by experience. Similar remarks apply to the estimates other people have of the long-run income potential of the claims and resources they possess.

10. Imputations in a Framework of Permanent Income and Production

The basic distinctions between consumption goods, instrumental goods, and net additions to wealth apply equally within a framework of current income and one of permanent income. The nature of the imputations that should be made will also be exactly the same within either framework.

At the same time, the distinction between current and permanent applies equally to each class of income account. Some items of consumption and some instrumental items are part of a permanent, or long-term pattern; others are transitory and are recognized as such. In a framework of permanent income analysis, the components of income and the imputations made to arrive at them should include only their permanent parts and not the transitorities.

For example, the cost and time absorbed in going to and from work is greater if the main highway one uses is torn up for repairs. If in a short while the repairs will be completed and the highway improved compared with its previous condition, this cost will fall below its previous value. Accordingly, this temporary inconvenience is not a deduction from permanent income; on the contrary, the prospect of the successful completion of the repairs implies an increase of permanent income over what it was before the repairs were expected. Similar remarks apply to other imputations, and to other parts of the income accounts.

To some extent the imputations that have been suggested in the previous sections would tend to reduce the aggregate transitorities in income and consumption. For example, the suggested adjustment for variations in leisure would remove from calculated income a transitory increase due to the acceptance of temporary overtime employment; and it would remove at least part of

the transitory fall in income due to unemployment in a temporary recession. This leaves transitory elements in the composition of income and consumption, however, which for some purposes it would be desirable to remove. (In any case, some important transitorities would remain in the aggregates, such as crop fluctuations.)

Many, if not most, of the imputations considered here would show very little fluctuation from year to year in the national aggregates, because transitory elements in them for different individuals would mostly cancel out. Exceptional circumstances do not always cancel out, however; a whole society can have exceptional circumstances in this as in other matters. A major flood or other national disaster would no doubt entail exceptionally high transportation costs—the costs of getting food and supplies into the stricken areas. A war will have many transitory effects, on imputations as on other things: there is heavy and costly migration of people to new jobs, more women enter the labor force, and so on.

Similar but not identical remarks apply to the directly measurable components of the national income accounts. For the most part it is preferable to regard consumption as being determined solely by people's estimates of their long-run income positions. To the extent that this is true, all consumption is permanent. An individual's consumption pattern is not always completely stable, however, even when his income position remains in agreement with his expectations. He may save for a long period in order to finance a long and expensive vacation trip, or he may take a temporary job under very attractive conditions (constituting a kind of consumption) at a low salary, expecting to make up the loss of income later in his regular employment and maintaining his tangible consumption at its previous level.

Thus consumption can have a transitory component also, unrelated to transitory or other changes in income. This is unlikely to be of any significance in the national aggregates, but it will sometimes be important

for smaller groups and for individuals.¹

11. Permanent Income as a Practical Working Concept

The measurement of current income, discussed in previous sections, primarily presents problems of statistical method and imputation; the measurement of permanent income, on the other hand, primarily presents problems of inference. Although in principle we might imagine a direct measurement technique for permanent income, such as experimenting to find the incomes people would accept under long-term contract in exchange for their existing prospects, in practice it must be inferred from objective information about past and present values of current income and about consumption behavior. The past behavior of income, including the typical patterns it follows over a person's lifetime, is the best information a person himself generally has about his long-term prospects; it is also the best information the outside observer generally has. Since different people will conclude different things from the same information, their consumption behavior also provides evidence on what they consider their long-term income prospects to be.

Proceeding in this indirect way necessarily required taking some propositions for granted; that is, it requires making arbitrary assumptions. In particular, some assumption must be made about how observed variations in consumption are to be interpreted; for example, one may choose to assume that all variations in consumption either are the result of variations in permanent income or are random (unrelated to any observable variable, such as transitory incomes). The arbitrariness of this procedure, and the uncertainty it implies concerning the true evaluation of permanent income, can be narrowed down by studying a wide range of different evidence on income and consumption; but it cannot be eliminated entirely.

1) Purchases of consumer durable goods are undoubtedly correlated with transitory income; however, these purchases should properly be considered a part of investment.

This discussion implies, among other things, that current income as ordinarily defined is an essential part of economic analysis, even where permanent income is the relevant variable. Accurate and conceptually sound measurement of current income and of its components is a prerequisite to even approximately accurate and conceptually sound measurement both of permanent income and of its components. Permanent income and the corresponding concept of permanent production potential, are interesting not because they simplify measurement problems (just the opposite) but because they aid the interpretation of economic behavior.

12. Concluding Notes: Money Income and Real Income

The preceding discussion has been concerned with the problem of how to define income and to measure income in such a way as to make differences in income correspond to real differences in economic welfare. The discussion has concerned points having to do both with comparisons between individuals and groups in different circumstances or locations at the same point in time and with comparisons between the same individuals or groups at different points in time.

For completeness this discussion must include some further mention of changes in the general price level over time. Even if the problems for depreciation accounting created by changes in the price level are appropriately disposed of, changes in income over time will in general represent the combined effects of changes in real economic welfare and nominal changes due to changes in the price level. For many purposes it is useful and desirable to separate the two kinds of changes.

Accordingly, it is necessary to devise a measure of movements in the general price level, or alternatively to devise a direct measure of how income would change if the general price level did not change. Either of these procedures implies a decomposition of changes in income into the two component parts, the real changes and the nominal changes. A direct measure of one of the components implies the other as a residual, when the total change in income is known.

The procedure usually followed in this connection is to divide measured income by an index of the general price level. (In the case of Real Gross National Product of the United States, this operation is performed separately on consumption, investment, and so on, and the resulting estimates are added to give the total. This is an intermediate procedure between the two alternatives just mentioned.) The construction of such an index poses problems of its own, of course; these are outside the scope of the present volume.

It should be borne in mind that for the most part when we talk about changes in income we mean changes in real economic welfare, not nominal changes resulting from changes in the price level. At times, however, the contrary is true, and it is important to specify what we mean. Usually the words "production" and "output" are taken for granted as referring to real magnitudes, but "income" can be taken in either sense. For clarity, one can either refer consistently to real income, where that is what is meant, or assume at the start of a discussion that the general price level remains constant, so that changes in money income are real changes.

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