to provide a standard for the achievement of economic balance, and that the exploration of such possibilities is desirable.

In the concluding paragraph of the paper I indicated the probability that greater reliability and significance could be attained in the comparison of farm and nonfarm incomes if they were made in terms of regional and size distributions of income. Many of the comments have also pointed in this general direction, with some emphasis on the desirability of distinguishing the claims of low-income persons in each group from those of the group as a whole. It may not be out of order to conclude that a general consensus concerning the most fruitful direction for further research on the problem exists.

Part Four

SIGNIFICANCE OF INTERNATIONAL TRANSACTIONS IN NATIONAL INCOME

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Significance of International Transactions in National Income

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I   Accounting Relationships

HOW INTERNATIONAL TRANSACTIONS enter national income accounts can best be summarized by recalling the conceptual distinction between income produced in an area and the income received by (i.e., accruing to) its residents. The latter is rather inappropriately called 'income produced' in most discussions; here the term 'domestic income' is used to denote income produced in the United States; 'national income' refers to income accruing to residents of the United States.

A   Domestic income

Income produced in an area (domestic income) can be most easily defined and estimated in terms of the consolidated accounts of all enterprises operating within its boundaries. For the sake of simplicity, the consolidated enterprise is considered to include, besides farming and other business, all professional and other services sold directly to consumers, governmental activities, and the proprietorship in all dwelling houses, patents, etc., i.e., all income yielding functions of people and things in the area except labor hired by enterprise. The borderline between the enterprise accounts and the personal accounts is naturally somewhat arbitrary and conventionalized, but having once fixed it, we can speak of domestic income as comprising simply the 'payroll' plus the 'profits' of the enterprise, the latter being the amount distributed among the creditors and proprietors, plus undistributed earnings. Obviously, special problems are met in accounting for nonprofit-sharing activities such as those of the government; and some solution of these problems is implicit in the simplified summary presented here.

Profits of the consolidated enterprise are computed by deducting the following items from sales of goods and services (including sales by one unit to another within the enterprise):

Depreciation on productive assets and depletion of natural resources

Value of net withdrawals from inventories held for sale

Direct costs of current output, comprising:

a) current purchases of goods and services (including labor)

b) value of net withdrawals from working inventories

In this calculation 'sales' are taken to include the value of facilities constructed by a unit of the enterprise for its own use, 'betterments' in existing installations, and deliveries of goods and services to employees (payment in kind) or to one's self (entrepreneurial withdrawals), as well as ordinary shipments or deliveries of goods and services. Since the value of sales by one unit to another within the consolidated enterprise equals the value of intra-enterprise purchases, consolidated profits may be expressed as equal to:

Sales of goods and services to residents (national consumption, excluding tourist expenditures abroad)

plus sales of goods and services to non-residents (exports, including expenditures of foreign tourists within the area)

plus gross value of additions to or betterment of domestic equipment

plus value of net increases in all inventories   ⎫ (gross capital formation)

minus purchases by the enterprise of services rendered domestically (payroll)

minus purchases by the enterprise of goods and services from abroad (imports, excluding tourist expenditures abroad)

minus depreciation and depletion (capital consumption)

If expenditures of nationals touring abroad are added to national consumption and also to imports in the above expression, the value of consolidated profits remains unaffected. Payroll plus profits (total domestic income) may then be written:

Total national consumption

plus exports (of all goods and services)

minus imports (of all goods and services)

plus net investment (gross capital formation minus capital consumption)

B   National income

Domestic income, which thus equals domestic capital formation plus national consumption plus the balance of trade in goods and services, differs from *national* income by an amount, hereafter called 'supplementary income', composed of (1) net earnings on foreign investments, accruing directly or indirectly to residents; (2) net wages received by residents for work performed outside the income area; (3) net noncommercial remittances construed as income by the recipients.

The total net foreign balance on account of goods, services, and the three items just enumerated equals the total net capital movement, or net foreign investment. National income, therefore, equals national consumption plus net investment (domestic and foreign). The expression 'change in claims against foreign countries' is ambiguous and should be avoided. Net foreign investment (capital movement) is not synonymous with 'change in net creditor position', for there may be a large discrepancy between the two owing to changes in the international balance sheet arising from:

Revaluations of directly owned physical assets

Fluctuations in the market value of securities (if valued at current market)

Revaluations occasioned by exchange fluctuations

Uni-directional remittances on capital account (inheritances, indemnities, etc.)

Change in the residence of individual property owners (whatever or wherever the property may be)

Residence, for purposes of income accounting, is based on place and permanence of abode, not on citizenship. Persons temporarily abroad for purposes of touring, intermittent employment, or service in the national army, navy, or merchant marine retain their residence status; persons working or living continuously abroad do not.

C Statistics of foreign transactions

There is an ambiguity about the notion of purchases and sales of shipping services. If merchandise imports and exports are accounted for by valuations at the national border, it is clear that no freight charges (as such) could be counted as service imports, unless foreign vessels were permitted to carry coastwise traffic; correspondingly, all freight receipts of domestic vessels for the carriage of exports and imports and for service between foreign ports must be counted as a service export. On the other hand, if imports are recorded not at the border value (as in most foreign trade statistics) but on an f.o.b. basis (the United States practice), then freight charges on imports carried on foreign vessels must be counted as a service import. The import freights received by domestic vessels must be excluded from the service exports of the latter.

Of the total expenditures of residents touring abroad, fares paid to domestic vessels must be excluded from the international service accounts, since domestically registered ocean vessels are treated as within the income area; likewise the expenditures of foreign tourists

are counted only while they are within the income area or on domestic ships.

In general, the annual balance of international payments of the United States prepared by the Bureau of Foreign and Domestic Commerce provides consistent estimates of all the important service transactions needed for computing income produced within the United States customs area. Unfortunately the area ordinarily used for income purposes differs from the customs area in that Alaska, Puerto Rico, Hawaii, and the Virgin Islands are excluded from the former but included in the latter. In addition to providing estimates of services, the balance of payments contains corrections of the ordinary trade statistics for omissions of sales and purchases of such items as ships and bunker fuel, and for estimated under- or overvaluations in customs declarations. In the summary table for each year, however, several items are included in the subtotal 'trade and service items' that belong in separate categories for income purposes; e.g., interest and dividend payments, noncommercial remittances, war debt receipts, Panama Canal profits, tax remittances to the Philippines, and various intergovernmental indemnity payments. Some of these transfers should be regarded as income payments contributing to the difference between domestic income and national income; the others might appropriately be treated as capital gains and losses to residents of the income area and so not counted at all. Royalties received from motion pictures exhibited abroad are counted as a service export. When the film remains in the possession of Americans, however, it might be more appropriate to count royalties with interest and dividends as earnings on foreign investments.

The method of reporting gold and silver movements in the balance of payments requires special attention, for earmarked holdings are treated as if they were outside the income (or customs) area, at least in the subtotal of net movements. These figures can be consistently used only if earmarked holdings are excluded from inventories in the calculation of domestic capital formation. For all other metals and materials, location rather than possession is the basis of trade and inventory statistics. It would be equally consistent, and perhaps more appropriate, to exclude the precious metals entirely from exports and imports, to include only domestic output in inventory accumulation, and thus by implication to treat gold and silver acquired from abroad as merely a claim against foreigners. The choice of treatment should obviously depend on

the use to which the data are put. To analyze fluctuations in income causally, it would seem more appropriate to treat gold as money than as merchandise. The formulas for the components of income are of course valid, whichever way gold is treated.

The compilers of the balance of payments estimate most of the 'supplementary income' items currently, but their summary table includes, for earnings on foreign capital, only amounts that are declared, or distributed, or transferred. (It is not clear which of these three criteria is the basis of the reports; in any case there is an irreducible element of ambiguity in each, especially in the case of earnings credited to inter-company accounts.) The amounts classified as 'reinvested' are currently reported in the text and subsidiary tables of the balance of payments.

The second item of 'supplementary income', international wage payments, is apparently negligible in the United States. In certain other countries it would probably be an important element in the income of seamen and migratory farm laborers. Some types of wage remittance should be, and are, counted as service imports (e.g., remittances to diplomatic and military personnel stationed abroad) and have been debited against domestic income. Since the recipients, as a rule, are classified as nonresidents, no further adjustment is needed.

The third item of 'supplementary income', voluntary contributions of individuals and institutions, seems adequately covered in the balance of payments. Indeed, the coverage may be too adequate. There is some justification for excluding items that both donor and recipient regard as a transfer of capital, e.g., inheritances.

The compilers of the balance of payments attempt to make a direct and independent annual estimate of the net capital movement, based largely on reported transactions in currency, banking funds, bills and securities, and on reported payments between American corporations and their foreign branches or subsidiaries. Because the data are incomplete, particularly for transfers of short term capital, this direct estimate of capital movements cannot be considered very accurate; a substantial discrepancy, or 'residual' usually exists between it and the indirect estimate based on merchandise, services, etc. The indirect estimate is ordinarily considered more reliable; it would in any case be preferable for national income purposes since it can be completely itemized without including unallocable elements. If a relatively accurate direct esti-

mate of capital movements is ever made, it should be reconciled with the indirect estimate by suitable adjustments of the more uncertain components of the latter.

II   Significance of the Foreign Component of Income

To illustrate the position of international transactions in national income, a summarized account for 1938 is presented herewith.

		MILLIONS OF DOLLARS
1) National consumption		62,500
2) Net domestic capital formation, incl. accumulation of gold & silver		3,686
3) Trade balance in gold & silver	−1,864	
4) Trade balance in other mdse	1,152	
5) Trade balance in services	−337	
6) Total trade balance		−1,049
7) Total domestic income		65,137
8) Net earnings on foreign capital	413	
9) Net noncommercial remittances	−150	
10) Total net supplementary income		263
11) National income		65,400

Because the net foreign investment, or capital movement (the algebraic sum of items 6 and 10), is negative, national income was apparently $786 million less than it would have been had the United States been economically isolated and produced for consumption and capital formation the amounts indicated in items 1 and 2. Since this negative contribution was largely due to the importation of gold, one might interpret it by saying that national income was less than it would have been had all domestic capital been formed from domestic output (rather than in part from imported gold). According to this interpretation, national income was diminished as a result of foreign transactions.

On the other hand, if this gold and silver had been accounted for as a claim against foreigners rather than as an imported increment of inventories (i.e., as money instead of as merchandise), there would have been a *positive* increment of claims against foreign countries in 1938 amounting to $1,078 million, but domestic capital formation would have been only $1,822 million. This would give the impression that national income was appreciably augmented as a result of foreign transactions. Evidently the notion of a foreign component of income or of capital formation is ambigu-

ous, if the method of accounting is not explicitly indicated. In Figure 1 and subsequent discussions gold is treated as money, rather than as merchandise.

In any case, *fluctuations* in such a component would afford a better measure of its *importance* than would its absolute magnitude; and they could conceivably generate parallel fluctuations in other components that would make total income far more dependent on international transactions than any static description would ever suggest.

Fluctuations in foreign trade greatly influence profit prospects and business plans. Aside from this indirect influence through the possible repercussions on the rate of domestic investment, foreign trade obviously contributes sufficiently to national income, through the foreign component of total investment, to merit special attention during periods such as the present when fluctuations in this component threaten to be large and unpredictable.

During 1919-38 fluctuations in net foreign investment were never very large compared with fluctuations in other components of capital formation (see Fig. 1). But this relative stability has in the past been due largely to a synchronization of major United States business cycles with cycles in foreign countries that caused imports to vary approximately with exports. With the interruption of this synchronization, the balance of trade has become more unstable; it increased, for example, from $33 million in 1936 to $1,395 million in 1940. In view of present uncertainties, one might even measure the potential variability in the export surplus in terms of total exports, whose value in 1940 was almost twice the average annual value of total net capital formation during the decade 1929-38.

As previously suggested, the separation of total capital formation into foreign and domestic components is a rather arbitrary accounting procedure; interpretation depends on the methodology. One might, for purposes of analyzing fluctuations, account for national income as follows:

1) National consumption
2) minus imports of services and merchandise other than gold and silver
3) plus government capital formation (including domestically produced gold and silver)
4) plus consumers' capital formation (e.g., in dwellings)
5) plus business capital formation

6) plus exports of services and merchandise other than gold and silver
7) plus supplementary income (interest from abroad, etc.)

For purposes of studying the dynamics of change, it is inappropriate to combine imports with exports into a net item. When condensation is needed, it is more logical to combine imports with

FIGURE 1

Components of Capital Formation as Percentages of Income, 1929 Prices
1919 – 1938
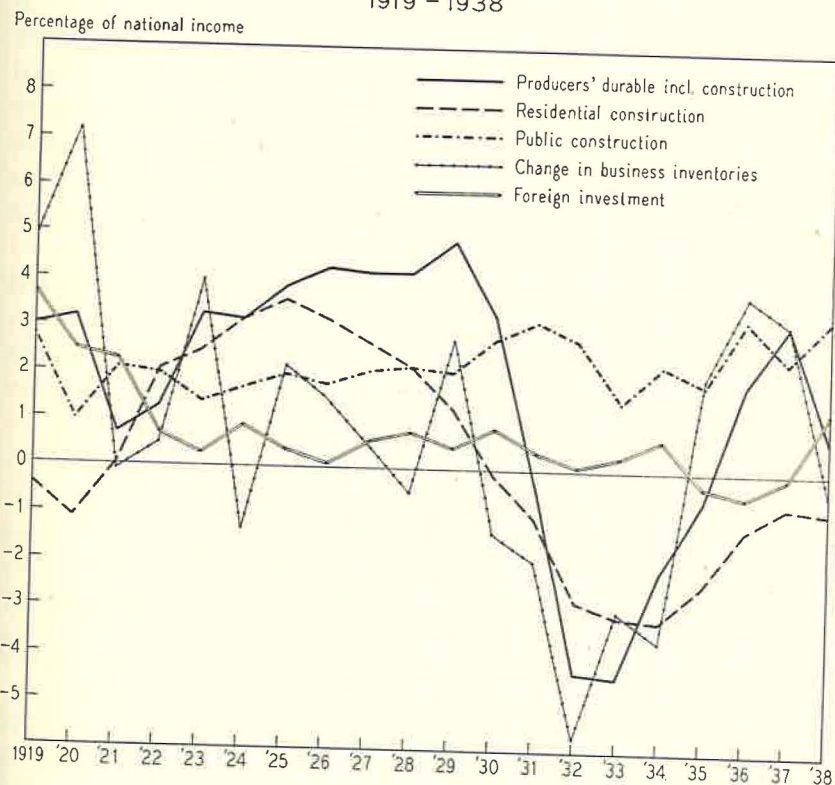
SOURCE: Simon Kuznets, *National Income and Its Composition*, Table 38.

consumption, with which its fluctuations are more closely correlated. 'Strategic' variables should be selected on the basis of homogeneity with respect to variations. The most effective are aggregates that are relatively homogeneous internally but relatively independent among themselves. Application of this criterion to the seven income components listed above has led some economists to treat items 3-6 as 'strategic' variables, to ignore item 7 as negligible, and to treat items 1 and 2 as dependent variables.

Whatever the merits of this approach, it would seem at the outset greatly to enhance the importance of exports in income. If, for example, exports should be reduced to one-half of their 1940 level (Britain alone took almost one-fourth of the total in that year), and if this reduction in this source of income, by reacting on consumption, should induce a threefold drop in total income, then the final loss in national income would amount to about $6 billion, greater than the gain in income between 1938 and 1939.

The type of hypothesis just described, commonly known as the 'multiplier' principle, needs more careful examination than it has ordinarily received. According to most interpretations (and there are many), the multiplier is the ratio between changes in national income and in the sum of the strategic variables enumerated above (or any one of them, the others being given). And according to most theories, this multiplier is supposed to be fairly constant, as a consequence of a supposedly simple dependence of imports and consumption upon income.

If, for example, it were found (e.g., by regression analysis) that consumption equals a constant h plus a constant k times income; and that similarly imports are determined by the formula m plus n income; then, by substituting these formulas in the equation defining income as a sum of its components, we would obtain

$$\text{income} = \frac{h+m}{1-k+n} + \frac{\text{sum of strategic variables}}{1-k+n}$$

(The small 'supplementary' income is ignored here, for the sake of simplicity.) The coefficient $\dfrac{1}{1-k+n}$ is then called the multiplier since it apparently determines the amount by which income will change per unit of change in the sum of the strategic variables.

There is also an alternative, simpler, and less interesting form of multiplier, one applicable to total investment rather than to the strategic elements used above. In its derivation, imports, instead of being treated as a dependent variable, are considered implicitly as 'given', since the net foreign balance is one element in total investment. This multiplier, equal to $\dfrac{1}{1-k}$, is derived as a coefficient of total investment by substitution of the formula, consumption $= h + k$ income in the equation, income $=$ consumption $+$ total investment.

The supposition of a functional relationship between consump-

tion and income is fundamental to either type of multiplier. In the above illustration a linear equation was given merely for convenience. If a curvilinear relation had been assumed, one would obtain the same formulas for the multipliers; k would then have to be interpreted as varying with the size of income, and a multiplier computed for any given level of income would be relevant solely for small changes in the vicinity of that value. This hypothetical curve relating consumption to income is called the (schedule of) propensity to consume, in Keynesian terminology. The coefficient k is called the marginal propensity to consume and can be pictured as measuring the slope of the curve. Like other economic coefficients, such as elasticity of demand, it may be supposed to vary either with a shift along the curve or with a change in the shape of the curve through time.

In other words, in estimating the current magnitudes of k (and of n, for that matter) it need not be assumed that they have remained fixed over a period of years. In regression analysis, however, an improvement of apparent 'goodness of fit' by prior elimination of trends does not necessarily lead to greater confidence in the estimate of the coefficient.

An alternative method of estimating the marginal propensity to consume (not applicable to imports) involving no assumption about trend (or lack of it) uses records of consumers' expenditure (in a recent year) by income classes. Implicit in it are the assumptions that the members of one income class would behave like the members of the next higher class if their incomes were raised to the higher level and that the percentage distribution of national income by size is fixed (or is a function exclusively of total income).

Finally, the proportion of their incomes that people choose to consume is governed by 'real' income rather than by mere money income, so far as any defensible *a priori* theory is concerned. Therefore, the shape of the propensity curve and the value of its coefficient k should be estimated, strictly speaking, from data deflated by a cost of living index and expressed on a per capita basis.

Attempts have been made to estimate the multipliers as defined above for various countries by using one or another of the methods outlined. Investigators working with United States data seem to have confined their attention to the 'simple' multiplier $\dfrac{1}{1-k}$. A summary of the results can be found in Colin Clark's *The Condi-*

FIGURE 2

Changes in National Income and in Investment, 1929 Prices
1919 – 1938

Change in national income
(billions of dollars)

SOURCE: Simon Kuznets, *National Income and Its Composition*, Table 37.

tions of Economic Progress, Chapter 15.[1] He quotes estimates of $\dfrac{1}{1-k}$ for the United States (four methods were used) ranging from 3.08 to 3.3. The close correspondence between the estimates based
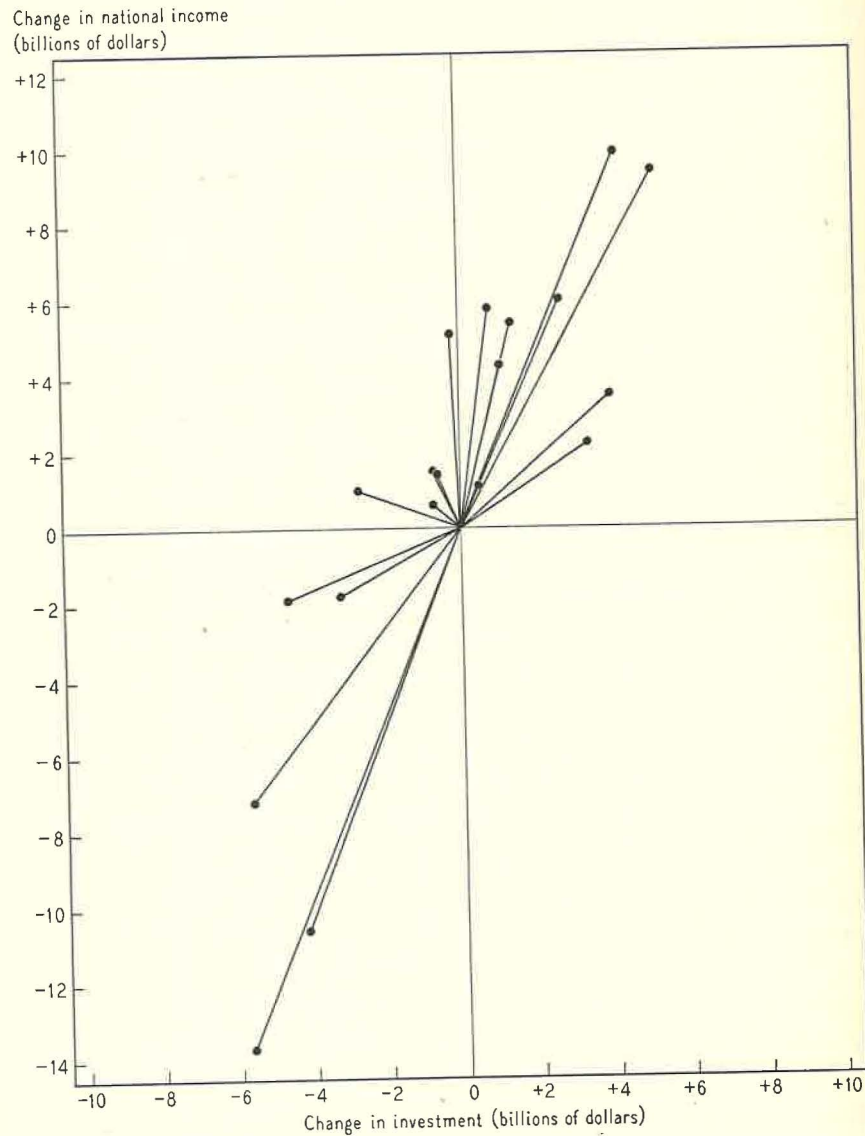
FIGURE 3

Consumption and Income, 1929 Prices
1919 – 1938

Consumption (billions of dollars)

Income (billions of dollars)
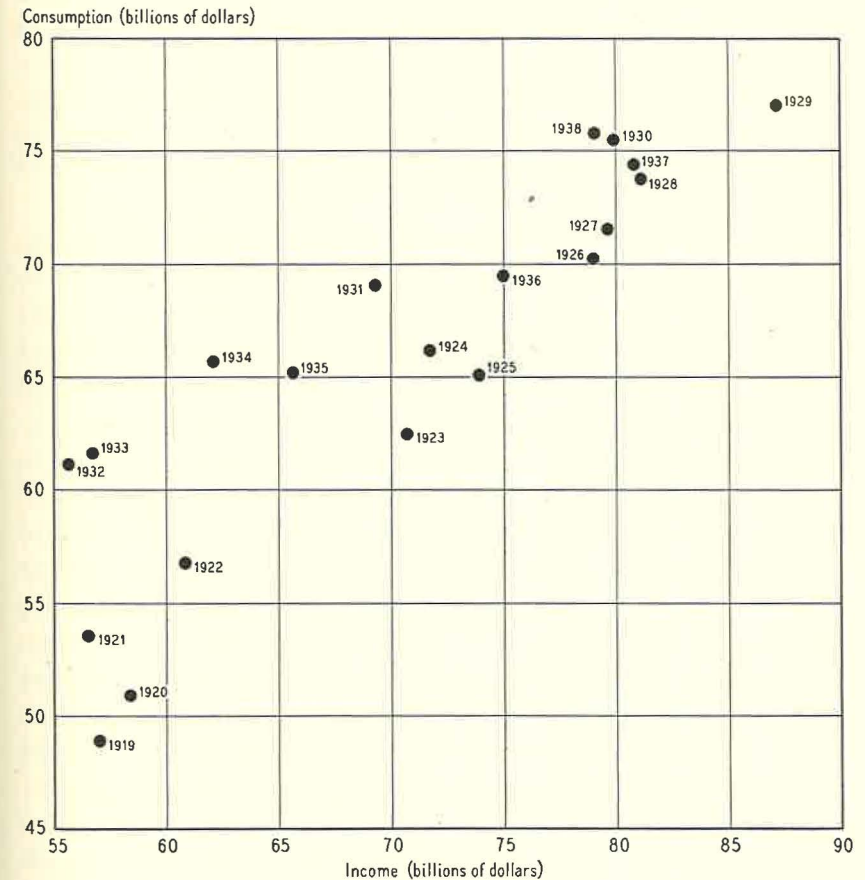
SOURCE: Simon Kuznets, *National Income and Its Composition*, Table 5.

on time series data and those based on income group data inspire some confidence in the validity of the hypothesis and the accuracy of the estimates.

The dependability of the consumption-income relationship and of the corollary income-investment relationship has sometimes

[1] London, 1940.

been challenged on irrelevant grounds. Clearly, confidence in the coefficients describing such relationships should be based on tests of significance appropriate to the method by which they were calculated. For example, the 'multiplier', when derived from one or more regression coefficients, should be tested accordingly. It is not customary or appropriate to compute the multiplier as an average of ratios between the yearly increments in an income series and the yearly increments in an investment series; and it would be quite absurd to test its significance by the variability of such ratios computed from successive pairs of years. Such ratios are shown graphically in Figure 2 as slopes of lines radiating from the origin. It is clear that there is much less certainty concerning the average of these slopes than concerning the slope of a regression line fitted to points in Figure 3.

In estimating the level of income that can be expected in association with a hypothetical rate of investment, reference should be made directly to the line of normal relationship between income and investment; it would be inefficient to compute the expected change in income as the product of the multiplier and the expected change in investment, for such a procedure ignores evidence concerning the deviation of income from normality with respect to investment in the base year. The expected change in income should be the algebraic sum of the change attributable to a change in investment and the change that would be expected in the absence of any change in investment. By operating only on first differences in the series, disregarding other information in the original data, account can be taken solely of the first element in the sum just mentioned. The result of such a procedure, though unbiased, is clearly unsatisfactory. Considerations of the usefulness and the validity of the multiplier may be summarized as follows:

1) The notion of a schedule of propensity to consume is useful to the extent that the proportion of income that people choose to consume is predictable on the basis of (real) income.

2) Undoubtedly other identifiable and measurable factors besides income influence consumers' outlay and are responsible for apparent deviations from the propensity curve (i.e., shifts in the position or shape of the curve); e.g., 'capital gains and losses' and some index of equality of distribution of income among consumer units.

3) Progress can be made only by actual analysis of the *joint* influence of these other factors along with income. It is more pertinent

to assess the relative importance of the various factors than to raise questions concerning the 'validity' of the propensity hypothesis.

4) So far as the additional factors (income distribution, capital gains, *et al*) are in fact temporally correlated with national income itself, their influence is already *implicitly* taken account of in any propensity curve derived from time series.

5) In this technical sense the propensity relation may be in part 'spurious'; i.e., when the joint influence of other factors is actually ascertained one may discover that the independent (or 'partial') influence of aggregate income upon consumption is somewhat less than any simple correlation would indicate. But the usefulness of this simple and technically spurious relation between consumption and income is not impaired by these considerations, for in it income serves merely as a convenient index of the combined net influence of several variables.

6) Implied in the propensity to consume concept is a corresponding relationship between total investment and income. The latter has significance and usefulness of its own; for example, it can be used to predict income on the basis of an assumed rate of investment—in particular, to predict a definite change in income, even when the rate of investment is assumed to maintain its level, because it affords a basis for determining the amount by which the previous income level had deviated from its normal relation to investment as a consequence of 'random' disturbances.

7) Implied in the example just given is an explanation of the anomalous instability of the ratio between year to year changes in income and investment.

8) Because of the instability of this ratio one must conclude that the multiplier concept, formulated as an average of annual ratios, leads to a good deal of confusion and error. Whatever merit and validity there may be in the general concept can be amply revealed by direct application of such derived relationships as the one mentioned in (6).

9) Condensed versions of these relationships in the form of misleading coefficients with catchy titles had better be avoided when possible. The multiplier coefficient, if used at all, should be used to compute, from a given change in the rate of investment, the amount by which income will exceed what it *would have been* in the absence of any change in the rate of investment.

The relation between income and consumption shown in Figure 3 is not very close or regular. There are several reasons, however,

for supposing that these data (National Bureau estimates) are not well suited to the propensity concept and that other variants of income and consumption would provide a fairer test.

1) The accuracy of the consumption estimates is admittedly low, since services are included merely as a residual item.

2) The scope of the estimates is probably too extensive. It might be better to consider only those elements of income that are at the direct disposition of individuals in one form or another and only elements of consumption over which direct individual choice can be exercised. It would therefore be appropriate to exclude income items that accrue to the community as a whole, such as 'government saving' and 'government services to consumers' (as measured by personal taxes). The latter item should be excluded from consumption as well. The elements of income remaining might be termed 'individuals' income' and would include business saving (since it accrues to individual stockholders, who have the opportunity to liquidate it by selling part of their portfolio in the open market), individuals' saving out of distributed income (after personal taxes), and individuals' consumption (government services excluded). It can easily be shown that individuals' income as thus defined also equals individuals' consumption, plus nongovernmental net investment (domestic and foreign), plus the governments' aggregate net deficit (on all accounts including acquisition of all gold and silver).

3) So far as corporate profits influence consumers' expenditure at all (and it may be a devious influence, *via* the paper gains accruing through appreciation in share quotations), it is probably the profits that are reported, rather than 'true' profits, that are relevant. There is no reason to suppose that most consumers are astute enough to allow for erroneous accounting methods employed by corporations. For this reason it would probably be appropriate to leave income unadjusted for errors in inventory valuation, rate of depreciation, etc. These adjustments should be eliminated from the National Bureau's estimates of income for the purpose of studying consumers' behavior.

4) The 'real income' that is relevant to consumers' behavior must be derived from a cost of living index rather than by any other method of deflation. The National Bureau's estimates of income in 1929 prices (used in Fig. 2 and 3) do not exactly meet this requirement.

Harold Barger has prepared quarterly estimates of income and

consumption in current prices, which I have had deflated by the National Industrial Conference Board's index of living costs (but not by the size of the population).[2] Barger's estimates are substantially free from the objections just enumerated, except that taxes

FIGURE 4

Total Income and Total Consumption by Quarters, Adjusted for Seasonal Variation, 1921–1938, Deflated by National Industrial Conference Board Cost of Living Index (1923 = 100)
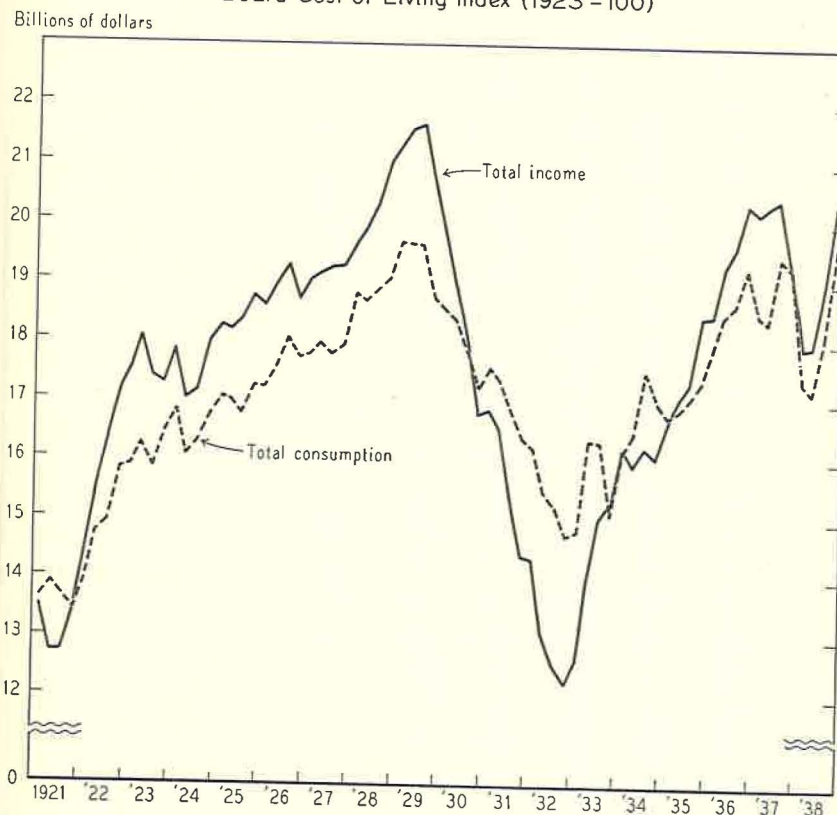
SOURCE: For consumption and income in current prices, see Harold Barger, *Outlay and Income in the United States,* Tables 11 and 18; for the index, 1921–34, see M. Ada Beney, *Cost of Living in the United States, 1914–1936;* for the index, 1935–38, see the *Survey of Current Business,* January 1941, Table 5.

paid directly by individuals (the National Bureau's measure of government services to individuals) have not been deducted. The quarterly movement of income and consumption is shown in Figure 4, and their relation in Figure 5. A line fitted to the points in

[2] *Outlay and Income in the United States, 1921–1938* (National Bureau of Economic Research, 1942).

Figure 5 seems to have a slope of about five-eighths, which would give a value of about 2.7 to the multiplier coefficient $\frac{1}{1-k}$, a somewhat lower value than those cited above from Clark.

Though there is some evidence of a slight lag (less than three months) of consumption behind income at certain cyclical turns, it

FIGURE 5

Total Consumption and Total Income by Quarters, Adjusted for Seasonal Variation, 1921–1938, Deflated by National Industrial Conference Board Cost of Living Index (1923 = 100)

Consumption (billions of dollars)

Income (billions of dollars)
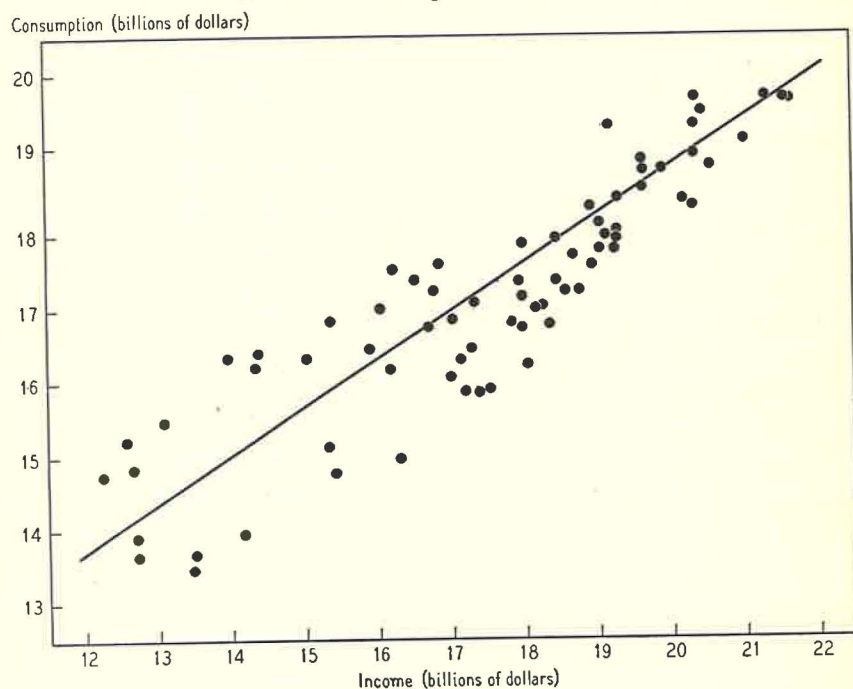
does not seem to be sufficiently pronounced or regular to be worth allowing for in correlating the two.

In many studies of the multiplier, efforts have been made to relate imports, as well as consumption, to income. The effect of imports on income, being negative, is often referred to as a 'leakage', and is interpreted as reducing the net influence of domestic investment on income.

In studying the relation between imports and income there is also some question which variant of income is most appropriate, and

whether some part of imports should not be excluded and separately analyzed. Why should imports vary with income at all? For some commodities it is obviously because demand is traceable rather directly and exclusively to consumers' outlay. In the United States this is true of coffee, sugar, silk, wine and spirits, fruits, nuts, and vegetables, cotton manufacturers, meat products, fish, wool and mohair and their products, cacao, and tea, to name only a few of the most outstanding examples. These products alone accounted for 35.6 per cent of merchandise imports in 1938. In this category belongs also an important 'invisible' import, the travel expenditures of American tourists, which constituted about 26 per cent of the value of merchandise imports in 1938.

Another category of imports includes items most of which are used in making goods for domestic consumption but some of which may be used in durable equipment or in exports. Rubber, paper, pulp, pulpwood, vegetable oils and seeds, tin, hides and skins, and furs alone contributed 27.8 per cent to total merchandise imports in 1938. Several important imports such as lumber and the ferro-alloys are used very largely in capital goods (a part of which are also exported as machinery, vehicles, etc.). A few materials, notably copper, have been imported in recent years almost exclusively for refining or manufacturing and re-export. None of these categories is distinct. Even such articles as coffee contribute sporadically to domestic capital formation in the form of inventories, and small percentages of practically all imported materials find their way eventually into exported products. Of the three major sources of demand for imported materials, consumption clearly predominates in the United States, but the influence of the other two should not be ignored.

It might seem that the relative influence of the three factors could be ascertained by analyzing the origin of materials entering into exports, increments of inventory, domestically installed equipment, and consumers' goods. The proportions in which imports entered these ultimate uses would then provide the necessary coefficients, it would seem. But this approach disregards several complicating factors. In the case of copper, for example, such information would be quite irrelevant. Until 1932, when copper was made subject to an import tax, exports of domestically refined or manufactured copper had been drawn from current output irrespective of the origin of the raw materials. The seller and the foreign buyer

knew or cared no more than the government whether a particular bar of electrolytically refined copper came from foreign materials, domestic ore, or scrap. The origin of the material, even if ascertainable, would not have been useful information. The only question of economic importance is the proportion in which domestic and foreign materials tend to contribute to *changes* in total supply. Because the foreign supply of copper has been relatively inelastic and growing rapidly, any decline in demand (whether for export or domestic use) tended, before 1932, to affect imports less than the output of domestic mines. Since the imposition of the import tax of 4 cents per pound in 1932, the exportation of copper refined or manufactured from imported materials (tax free under bond or with tax remitted on exportation) has been almost entirely independent of, and non-competitive with, domestic production and consumption. Only since 1932, therefore, does the origin of materials in exported copper products have any significant bearing on the response of imports to changes in export demand.

Though in the United States consumer demand is ordinarily the predominant influence on imports, in other countries such as Japan and Great Britain, where probably as much as one-fifth of the value of exports is normally allocable to imported materials that have no close domestic substitutes, careful study of the export-import relationship is essential in any analysis of the dynamics of income. On the other hand, in the 'younger' countries that must import most of the equipment for their growing industries, imports bear a relatively close relation to domestic capital formation, which should be given explicit attention in analyzing income. For example, if a country's entire capital formation for a year consisted of imported equipment, any stimulus to income on account of this investment would be felt exclusively in the region from which the equipment had been exported.

Even in the United States particular attention should be paid to the relation between imports and inventory accumulation. Many items in the government's stock of strategic reserves, e.g., tin, chromium, tungsten, and rubber, come almost exclusively from foreign sources. Recent reports have suggested that even for copper the government will draw on foreign sources, partly for the sake of economy (the government does not count the tax as a cost) and partly in the interest of good-neighborliness. Private inventory accumulation of many materials is also a stimulus to imports. In

other words, current inventory accumulations, unlike other forms of capital formation, are making less net contribution to national income, in a causal or dynamic sense, than is often supposed.

FIGURE 6

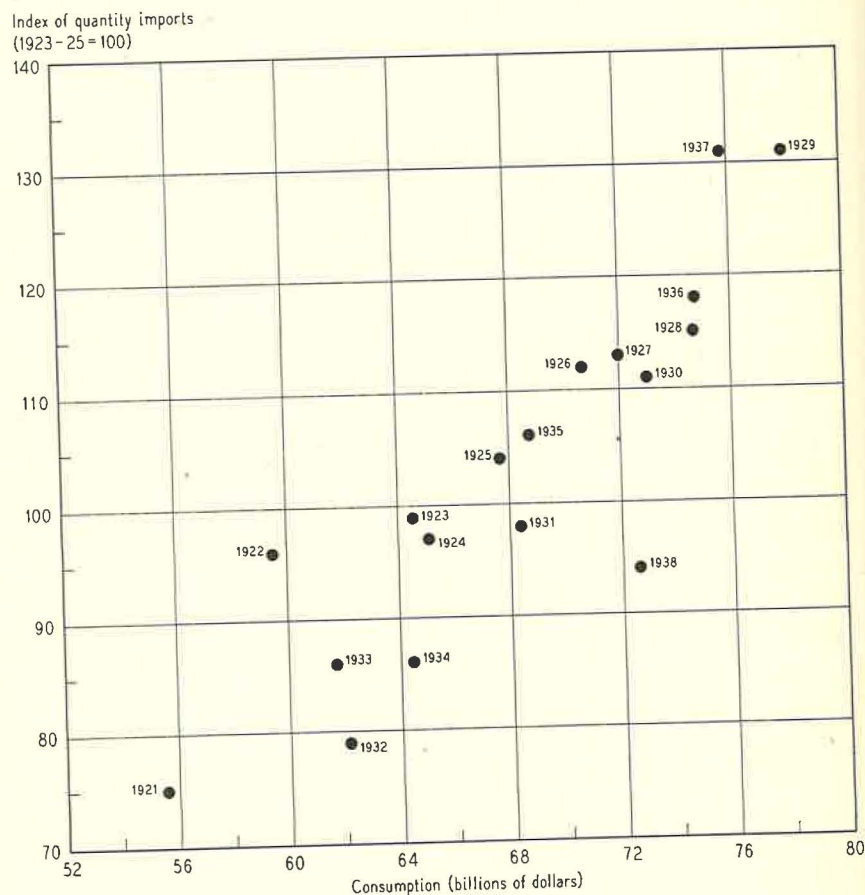Imports and Consumption, Current Prices
1921 – 1938
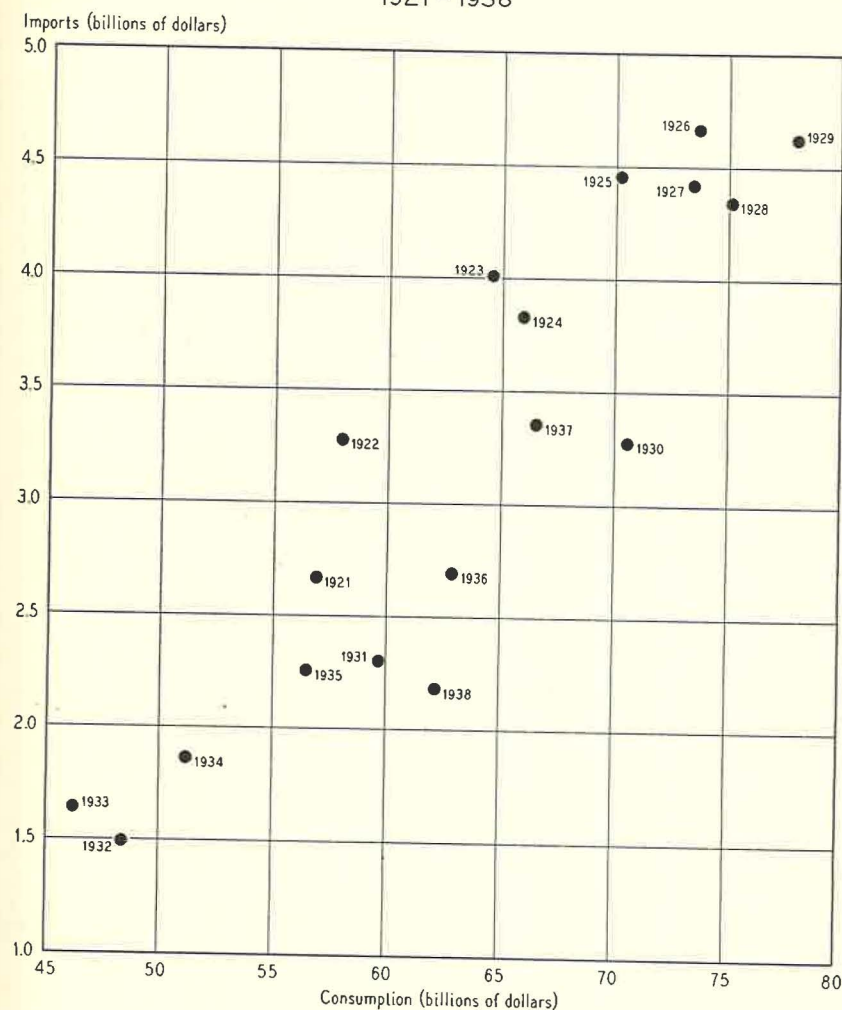
SOURCE: For consumption see Harold Barger, *Outlay and Income in the United States*, Table 1; for imports see the *Statistical Abstract*.

The assumed relation between imports and consumption in the United States has been neither close nor regular, at least as reflected in current values (Fig. 6). On the average, changes in imports seem to be about one-tenth as large as corresponding changes in con-

sumption. Some of the irregularity must be attributed to changes in inventory; the increase in imports between 1936 and 1937 is probably a good example (the quantity index of imports rose 11 per cent). But of chief importance is the erratic behavior of prices

FIGURE 7

Quantity of Imports, Department of Commerce Index, and Consumption, Deflated by National Industrial Conference Board Cost of Living Index (1923 = 100)
1921 – 1938

SOURCE: For consumption in current prices see Harold Barger, *Outlay and Income in the United States*, Table 1; for the N. I. C. B. index see Figure 4; for index of quantity of imports see the *Statistical Abstract*.

of imported materials relative to prices of consumers' goods in general. When a quantity index of imports is compared with the deflated values of consumption, the relation seems somewhat closer (Fig. 7). Apparently it would be appropriate to consider some index of import prices (or the ratio of this index to the cost of living

index) as an independent variable in analyzing the relation between consumption and imports.

To sum up, it seems desirable in general to relate imports not merely to income but to at least four variables: consumption, exports, domestic capital formation, and the price ratio just described. Even with this 'refinement' in method, one should not expect to obtain a very dependable formula for imports. Each of the four variables is an aggregate whose variations in composition (other than those regularly associated with fluctuations in the aggregate itself) can disturb the behavior of imports not a little. At the same time, application of even this simple refinement presents serious statistical problems. A formula derived by multiple regression is not likely to inspire much confidence, principally because one cannot safely assume stability of the relation during a period long enough to provide the necessary data. In the case of the propensity to consume, this type of difficulty can be surmounted to a considerable extent by use of contemporary data drawn from different income classes. No such alternative method seems to be readily available for analyzing the behavior of imports. These considerations are of less weight for the United States than for most other countries for two reasons: first, because of the predominant influence of consumption upon imports; second, because of the relative unimportance of imports in income.

Undoubtedly the most satisfactory way to analyze the relation of imports to other components of income would be by the laborious process of studying separately the behavior of each important commodity imported, then aggregating the results for purposes of generalization. For each commodity the normal relation (if any) between imports and total supply (imports plus domestic production), and the normal relation (if any) between stocks (irrespective of origin) and total domestic inventories should be ascertained. The amount of the commodity (irrespective of origin) embodied in exports would have to be estimated and its relation to total exports studied. The amount embodied in current consumption would also have to be estimated and its relation to total consumption considered. From these four relationships an equation relating imports of a particular commodity to total consumption, total exports, and total domestic inventory formation could be derived; but the relation would be simple and useful only if the price factor proved unimportant.

If it were possible to obtain a credible equation relating total

imports to consumption, exports, and domestic investment (ignoring the price factor here, for the sake of simplicity), that had the form: imports $= a + b$ consumption $+ c$ investment $+ d$ exports, then it would be necessary to distinguish two kinds of multiplier coefficients: an export multiplier, whose formula would be $\dfrac{1-d}{1-k+bk}$ and a domestic investment multiplier, whose formula would be $\dfrac{1-c}{1-k+bk}$. In view of the number of assumptions implicit in these formulas and the danger of their misinterpretation, it is probably wise to use them as sparingly as possible, even in abstract discussion, and to interpret directly whatever analytic relations the data reveal without condensation into coefficients.

III Some Implications of Current Developments in Foreign Trade

The prospective influence of foreign trade on the national income of the United States depends, like so many things today, almost entirely on the course of the war. In the absence of any basis for prediction, it is feasible to consider only the implications of recent trends in the foreign trade of the United States.

In analyzing these trends, it is convenient to distinguish six influences of the war on the foreign trade of the United States:

1) Larger exports of war materials to Great Britain
2) Higher costs of most imports
3) Accumulation of imported materials in domestic inventories
4) Accumulation in domestic inventories of certain materials normally exported, especially agricultural products
5) Replacement of part of the lost European markets by South American markets (aided by loans from the Export-Import Bank)
6) Partial replacement of imports no longer receivable from Continental Europe by domestic commodities and by imports from other areas.

Of these trends, probably the first three will be of growing importance in the future. The status of the last three is not likely to change much as long as the war lasts, since the indicated adjustments have by now probably worked themselves out. Shipments of food to Spain, unoccupied France, and possibly even occupied areas may increase moderately. Exports to Latin America may decline some-

what as a result of foreign exchange difficulties there. Efforts to promote purchases of Latin American products (e.g., cheese, wine, fabrics, tourist services) in substitution for unavailable European supplies may have some success. But on the whole, the most important developments affecting national income through foreign trade will probably be a continued rise in the price level of imported goods, a continued upward trend in shipments to Great Britain, and a continued or accelerated accumulation of reserves of imported raw materials.

Though the value of merchandise exports will probably rise more rapidly than the value of merchandise imports, the stimulus to income may be partly mitigated by a larger net deficit on shipping account. In other words, the c.i.f. cost of imports is rising even faster than the f.o.b. cost; and expanded earnings of American ships may not entirely offset this increase (though according to recent estimates they did so during 1939-40). In 1939 about 77 per cent of the $742 million expended for water transportation of American exports and imports was received by foreign vessels. If this ratio persists, a general rise in shipping rates will swell the net deficit on shipping account. Nevertheless, the balance of claims seems to be growing more 'favorable'; and will therefore contribute more and more to national income.

To appraise fully the contribution of the foreign component would require some kind of conjecture about its repercussions on the domestic components of income. The best that can be attempted here is to ignore the influence of export expansion and import contraction (in some lines) upon decisions to enlarge domestic manufacturing capacity, and upon inventories of exportable products, and to focus attention on the effect of trade trends apart from such influence. Though the conclusions, being highly conjectural and artificial, are of little value in themselves, the discussion may serve to suggest types of economic data worth compiling in order to facilitate this branch of income analysis.

As a guide to the future, we may review the partial and relatively direct effects on national income of changes in the foreign trade of the United States during 1939 and 1940, abstracting from those relationships that do not lend themselves to analysis by means of the 'multiplier'.

Largely because of the war, merchandise exports contributed $845 million more to national income in 1940 than in 1939, rising from $3,177 million to $4,022 million. Under the assumption that

consumers normally spend about five-eighths of any addition to their incomes and that one-tenth of the larger consumption is accounted for by imported materials (i.e., nine-sixteenths of the income increment is spent in such a way as directly to regenerate income), one could attribute to exports, using the mutiplier analysis, about $1,930 million of the estimated 1939-40 increase of $4,500 million in national income. The remaining increase in national income ($2,570 million) would be attributable, according to this interpretation, to the combined net effect of a higher rate of domestic investment and of the difference between 'random' elements of income in 1939 and 1940. Any 'abnormal' change that may have occurred in the level of imports constitutes one of these random elements and deserves special attention.

Between 1939 and 1940 merchandise imports rose from $2,318 million to $2,625 million; the increase, $307 million, exceeds by $26 million the amount expected on the basis of 'normal' relations between imports and consumption (Fig. 6) and between consumption and income (Fig. 5). These $26 million in turn are attributable to the combined net effect of a higher rate of domestic inventory accumulation (or.at least an abnormal share of imported materials therein) and of a curtailment of foreign supplies.

To compute the value of imports embodied in net inventory accumulation would entail, as suggested above, a difficult compilation and summation, covering commodities both in their original state and at all stages of fabrication. Were annual estimates of this component of inventory formation available, we might be able to distinguish between import changes normally associated with changes in the rate of aggregate net inventory accumulation and those that were 'abnormal'. The immediate importance of the latter is indicated, rather inadequately, by the fact that government agencies were expected to disburse about $700 million during 1941 and 1942 for reserves of tin, chromite, tungsten, manganese, and antimony alone. In addition, rubber and other materials will continue to be imported, and most strategic materials in private inventories will probably be accumulated at a relatively high rate.

In the absence of any direct estimate of the contribution of imported materials to inventories during the last two years, a comparison of imports with production may provide a rough indication of its general order of magnitude. The average level of the Federal Reserve Board index of industrial production rose 13 per cent between 1939 and 1940, while the Commerce Department

quantity index of imports of industrial raw materials rose 22 per cent. If the difference, 9 per cent, were expressed in current values, the rate of flow of imported materials to inventory could be said to have been roughly $70 million higher in 1940 than in 1939.

If this figure were taken as correct, the aforementioned 'abnormal excess' of $26 million would be more than accounted for, and an 'abnormal deficiency' of $44 million attributable to changes in the conditions of supply of imports would remain. The most conspicuous aspects of the latter were a decline of $133 million in imports from Continental Europe and a rise of 7.3 per cent in the average f.o.b. price of all imports (while average domestic wholesale prices rose only about 2 per cent). These changes are further reflected in the 12 per cent rise in the average price of manufactured imports (excluding food) together with a 16 per cent decline in the quantity imported. Imported foodstuffs declined in both quantity and price.

In addition, American tourist expenditures declined drastically. The balance on tourist account in 1939 is estimated at $299 million, of which $163 million represents net payments to Canada and $50 million net payments to Europe. A preliminary estimate for 1940 puts the net deficit on travel account at $142 million. Though certain elements in the two figures are not comparable, the decline in net tourist expenditures was certainly not far from $150 million. If this amount were added to the last mentioned 'abnormal deficiency' in United States imports, one could say that events abroad during 1939-40 had the direct effect of reducing total imports (of goods and services) $194 million.

Since these events also increased exports $845 million, the net direct effect was to 'improve' the trade balance by $1,039 million. The balance actually became only $688 million more favorable (including the estimated decline on tourist account), so that the residual of $351 million must be interpreted as a passive response to changes in domestic components of income: $70 million of it being imputed (as a rough guess) to domestic capital formation and the other $281 million to consumption (computed, as above, at one-sixteenth of the $4,500 million increase in income).

This type of analysis ignores any relation between exports and domestic investment, not by assuming that the latter is governed by entirely separate motivating factors, but rather by abstracting from these factors and taking domestic investment as 'given'. This abstraction puts an especially artificial interpretation on fluctuations in inventories of products for which the export market is really an

important influence. For example, shipments to Britain of military equipment not currently produced were included in exports, even though they brought no immediate income, the export being directly offset by an inventory decumulation, both in the income accounts and in a causal sense.

To sum up, this method of interpreting changes in income components assigns an active and independent role to certain elements in the trade balance and to that part of domestic investment not directly accounted for by the accumulation of imported materials. On the basis of the propensity estimates previously used, the $1,039 million 'autonomous' improvement in the trade balance from 1939 to 1940 must have been responsible for an increase in income amounting to $2,375 million, or more than half of the total increase. The remaining increase in income, $2,125 million, is attributable to a higher rate of domestic investment (other than the part of inventory excluded above) and to random factors not already accounted for.

Conjectural though all these figures are, they suggest that developments abroad, even apart from their influence on domestic plant expansion, have caused an increase in national income during 1939-40 that possibly exceeds that of domestic capital formation and is certainly unprecedented in the last twenty years.

Part Five

FORECASTING NATIONAL INCOME AND RELATED MEASURES

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