economic review

FEBRUARY 1965

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U. S. MERCHANDISE TRADE

BY COMMODITY GROUP, 1950-1964

U. S. merchandise trade reached a record level in 1964 when exports, excluding military grant aid, amounted to $25.0 billion and imports were valued at $18.5 billion.[1] (See Chart 1.) Thus, both exports and imports in 1964 continued the upward trend that has existed on balance since 1950, despite some large intervening fluctuations.[2] Inasmuch as exports have expanded faster than imports, the United States throughout the 1950-64 period maintained a favorable trade balance, that is, an excess of exports over imports, which has increased in recent years. Merchandise trade has thus made an important contribution to the U. S. international payments position, particularly since it represents the largest single category in the overall balance of payments.

The purpose of this article is to review the commodity distribution of U. S. merchandise trade and to discuss some of the factors that have been associated with both the increase in trade and the favorable trade balance in the 1950-64 period.[3]

Crude Materials

In the period under review, U. S. exports of crude materials increased more than 45 percent, but not at a steady rate (see Chart 2).[4] After showing little change from 1950-55, such exports rose sharply to an all-time high
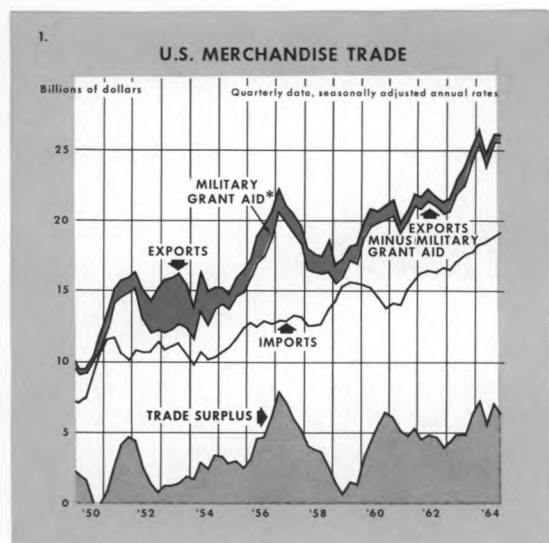
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[1] Reexports are included in the export figures. The import data include imports for immediate consumption plus entries into bonded warehouses.

[2] For the 1950-64 period, the increase in exports amounted to 155 percent and in imports to 102 percent.

[3] The article "U. S. Merchandise Trade by Geographical Area, 1950-1963", which appeared in the August 1964 issue of *Economic Review*, discussed the geographical distribution of U. S. international trade.

[4] Export data by commodity group include defense shipments and special category commodities, and exclude reexports.

1.

U.S. MERCHANDISE TRADE

Billions of dollars   Quarterly data, seasonally adjusted annual rates

MILITARY GRANT AID*

EXPORTS

EXPORTS MINUS MILITARY GRANT AID

IMPORTS

TRADE SURPLUS

'50   '52   '54   '56   '58   '60   '62   '64

* Estimated first and second quarters of 1950
Source of data: U.S. Department of Commerce

of $3.2 billion in 1957 when large shipments of coal and petroleum were made as a result of the Suez Crisis. The termination of the Suez incident, however, caused these exports to recede, and by 1959, volume had declined to $1.9 billion, or approximately the same as the 1950-55 level. During the past five years, exports of crude materials have again increased, and in 1964 they amounted to $2.8 billion.

Much of the 1960-64 increase was due to expanding shipments of coal, which had been relatively low in 1960, and oilseeds. In the production of coal, the United States has a distinct cost advantage over other nations. Because coal deposits in this country lie relatively close to the surface of the earth and tend to run mainly in horizontal seams, they lend themselves to mechanized production methods.

Exports of oilseeds, including soybeans and cotton seeds, increased substantially in

1960-64 particularly because such products were used extensively by a number of foreign nations as a meat substitute and in the production of fats and oils, as well as for animal feed. Last year the principal customers for U. S. exports of oilseeds were Japan, West Germany, and the Netherlands.

Despite rising economic activity in the United States, imports of crude materials have shown little tendency to increase.[5] Last year these imports totaled $3.4 billion, or approximately the same amount as in 1951. Imports of crude materials, including natural rubber and nonferrous ores, have failed to expand mainly because of technological progress in the United States. Synthetic materials have been developed to substitute for a number of imported natural products, and new processes have been introduced to economize on raw materials. The case of petroleum is a somewhat different matter, where quotas have been imposed to hold down petroleum imports into the U. S.

As shown by Chart 2, U. S. exports of crude materials have fallen short of imports throughout the 1950-64 period. Last year's deficit of more than $600 million was the largest of any commodity group. The overall deficit reflects the extent of U. S. reliance on foreign sources for crude materials, which in turn is due to a shortage of high-grade raw materials and the competitive nature of a number of imported products.

Crude Foodstuffs

U. S. exports of crude foodstuffs more than

[5] Import data by commodity group include imports for immediate consumption plus withdrawals from bonded warehouses.

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tripled between 1950 and 1964 (see Chart 2) mainly as a result of increased shipments of wheat, although corn and other grains also contributed to the rise. The greatest expansion occurred between 1954 and 1964, when exports increased from $800 million to $2.5 billion, largely because of Public Law 480, commonly called the Food for Peace Program.[6]

Under the Food for Peace Program, wheat and feed grains were exported in large quantities to approximately 50 nations, the principal recipients being India, Pakistan, and Egypt. Technically, most of these exports were sold for local currencies. However, since the United States has made no significant purchases of goods and services with these local currencies, P.L. 480 exports have really served as part of our economic aid shipments.

In recent years exports of crude foodstuffs also have increased because of substantial shipments of wheat and barley to Soviet-bloc nations. Particularly noteworthy was the sale of $125 million worth of wheat last year to the Soviet Union, one of the largest U. S. transactions in crude foodstuffs with any Soviet-bloc nation.

Total imports of crude foodstuffs showed no upward tendency during the period under review. In 1964 these imports amounted to $2.0 billion, almost equivalent to the 1950-52 level. Rising imports of fish, shellfish, and bananas were offset by declining imports of coffee.[7]

In 1950-54 U. S. international trade in crude foodstuffs showed a large deficit (see Chart 2). Because exports increased while imports remained virtually unchanged, the deficit narrowed considerably during the next six years, resulting in an actual surplus in 1961-64. Last year our favorable trade balance in crude foodstuffs amounted to $500 million, the largest trade surplus of any commodity group except for finished manufactured products.

Manufactured Foodstuffs

Beef, sugar, and whiskey have accounted in large part for the steady upward movement in U. S. imports of manufactured foodstuffs, which increased between 1950 and 1964 from $900 million to $1.9 billion (see Chart 2).

Beef herds in this country have grown sharply since 1955 and there has been little need to import high-grade beef into the United States. On the other hand, dairy herds, the primary source of low-grade beef, have declined substantially because of a sharp rise in milk productivity. The decline in such herds has created a shortage of low-

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[6] U. S. agricultural exports were of major importance in postwar assistance to Europe and Japan under the United Nations Relief and Rehabilitation Administration, the Marshall Plan, and other relief and recovery programs. In 1954 a fixed portion of economic aid funds was earmarked to buy surplus farm commodities from the United States. Public Law 480, which was passed in that same year, has provided the bulk of these funds. The law provides for the disposal of surplus farm products by (1) sales for foreign currencies, (2) disaster relief, (3) donations and barter, and (4) long-term dollar credit sales.

In ten years of existence, the total Food for Peace Program has shipped abroad farm products valued at $12.3 billion, or about 27 percent of all U. S. agricultural exports.

[7] Although the physical quantity of coffee imports increased between 1950 and 1964, dollar value decreased because of a decline in the world price of coffee.

grade beef, which is used principally for frankfurters, hamburgers, and other processed meat products. The insufficient domestic supply of low-grade beef has stimulated a rise in competitive beef imports, mainly from Australia and New Zealand.

The Sugar Act of 1934 and succeeding legislation has imposed comprehensive controls on the domestic sugar industry. Briefly, the intent of such legislation is to protect producers and restrict sugar production in the United States. The industry is regulated because domestic production of sugar represents for the most part a high-cost operation, compared with a number of foreign nations.

Each year the U. S. Government determines the amount of sugar needed to fill total requirements based on consumption in the previous year, inventory accumulation, and increase in population. Annual requirements are then allocated to domestic and foreign producers. Inasmuch as domestic allocations have not filled rising total requirements, sugar imports have increased almost 60 percent since 1950. Such imports were purchased from Puerto Rico as well as a number of foreign sources, including Brazil, the Dominican Republic, and the Philippines.

Imports of whiskey, which amounted to approximately $230 million in 1964, more than doubled during the period under review. A large portion of the rise was due to the expanding market for Scotch whiskey imported from Great Britain. Since the mid-1950's the market for Scotch whiskey has expanded because of a sizable demand for "light" brands, which are blended from a higher proportion of grain whiskeys as distinct from malt whiskeys.

In 1964 exports of manufactured foodstuffs totaled $1.6 billion, almost double the 1950 level (see Chart 2). The increase over the period was due to a myriad of products, including lard, dairy products, prepared vegetables, and processed fruits. Inasmuch as the level of these exports was below that of imports, the trade balance in manufactured foodstuffs showed a deficit between 1950 and 1964. Last year the trade deficit amounted to approximately $300 million, the second largest of any commodity class.

Semimanufactures

U. S. exports of semimanufactured products more than tripled between 1950 and 1964 (see Chart 2). Overall expansion was the result of several factors, including the increase in U. S. direct investment overseas as well as rising economic activity in Western Europe, Canada, and Japan.

The largest expansion occurred between 1953 and 1957, when exports increased from $1.4 billion to $3.2 billion. In that period, exports of many kinds of products expanded because of strongly rising economic activity in Western Europe. In 1955-57 large-scale foreign investments by the U. S. petroleum industry contributed substantially to the rise of steel exports, principally to many of the less developed countries in South America and Asia, but also to Canada. Because of the Suez Crisis, large shipments of fuel oil also contributed to the export increase in 1956-57.

In 1958 exports of semimanufactured products declined in part because U. S. direct investment abroad was not nearly as large as during 1955-57, and because of an

economic recession in Western Europe. Beginning in 1960, as a result of rising economic activity in a number of foreign nations and a large amount of U. S. direct investment abroad, exports of semimanufactured products again expanded, averaging $3.4 billion per year in 1960-63. Another increase was registered in 1964 when such exports totaled $4.0 billion.

In recent years, exports of semimanufactured products have expanded primarily because a number of companies established foreign plants either to finish partly processed materials or assemble parts shipped from their factories in the United States. Partially because of low import barriers abroad on semimanufactured products, foreign plants enabled our firms to compete successfully in a number of world markets. For that reason, aluminum, chemical and pharmaceutical companies — to mention only a few — established a network of foreign operations, all of which consumed large quantities of semimanufactured products from the United States.

U. S. imports of semimanufactured products almost doubled during the 1950-64 period. The overall movement followed a cyclical pattern, rising markedly during the 1958-60 expansion, for example, and declining substantially in the 1960-61 recession. Since 1961, reflecting expanding economic activity, U. S. purchases of semimanufactured products have again shown a strong upward movement, with such purchases last year amounting to $4.0 billion.

The close association between the behavior of U. S. imports of semimanufactured products and changes in the level of economic activity in the United States during 1950-64 is documented statistically in the Appendix to this article. There it is shown that a 10.0 percent increase (decrease) in industrial production has caused on the average a 10.3 percent increase (decrease) in imports of semimanufactured products. (See the Appendix for fuller treatment.)

In 1961-64, imports of semimanufactured products increased in part because of substantial U. S. purchases of aluminum and steel. Imports of primary aluminum expanded because of favorable, or at least competitive, prices in Canada and several other foreign countries. Also, some fabricators in the United States preferred to buy from foreign suppliers rather than purchase aluminum from their domestic competitors who are both primary producers and fabricators of aluminum.

Growth of efficient steel production abroad contributed to the marked rise in U. S. steel imports. Japan, Canada, Belgium, and Luxembourg have been foremost in producing low-cost steel products which compete vigorously with those of the United States.

As shown by Chart 2, in 1950-63 U. S. trade in semimanufactured products was in deficit status except in 1957 and in 1960-61. In recent years, however, the deficit has narrowed considerably with exports rising faster than imports. In 1964, exports of semimanufactured products were approximately equal to imports.
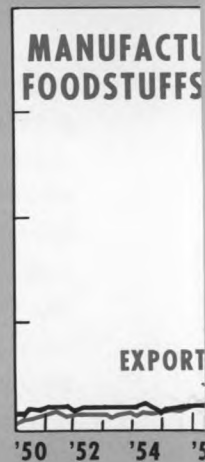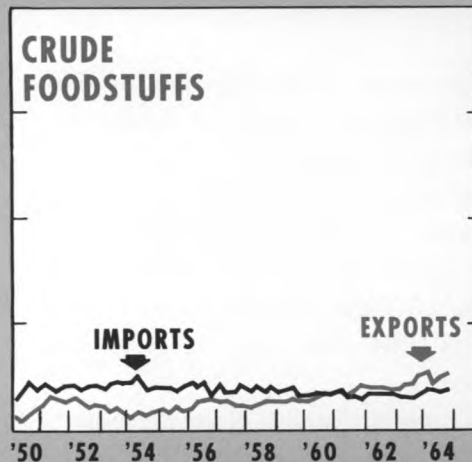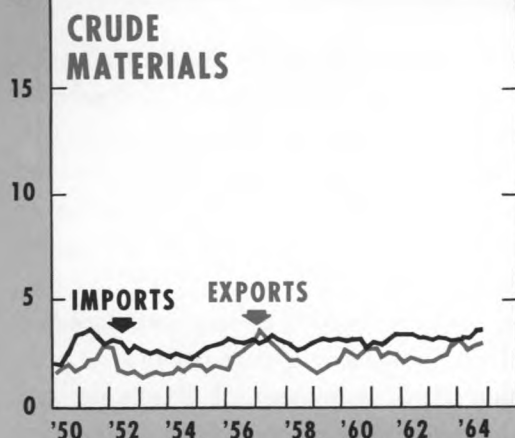
Finished Manufactures

U. S. merchandise trade in finished manufactured products showed a persistent large-scale surplus during the entire period under review (see Chart 2). Between 1950 and

Billions of dollars

CRUDE
MATERIALS

IMPORTS   EXPORTS

'50 '52 '54 '56 '58 '60 '62 '64

CRUDE
FOODSTUFFS

IMPORTS   EXPORTS

'50 '52 '54 '56 '58 '60 '62 '64

MANUFACTU
FOODSTUFFS

EXPORT

'50 '52 '54 '5

Quarterly data, seasonally adjusted annual rates.
Source of Data: U.S. Department of Commerce.

1960, the trade surplus fluctuated rather widely primarily because of volatile exports. Beginning in 1961, however, the U. S. favorable trade balance in finished manufactured products increased steadily, to the extent that last year exports exceeded imports by $7.1 billion, the largest surplus of any commodity class.

Exports of finished manufactured products increased from $5.8 billion in 1950 to $14.8 billion in 1964. The general upward movement, however, was irregular. In 1950-53 these exports nearly doubled because of military aid during the Korean War and because of large shipments overseas of aircraft and related parts. Since that time exports of capital goods, such as industrial machinery, electrical apparatus, and computers, have been an important influence.
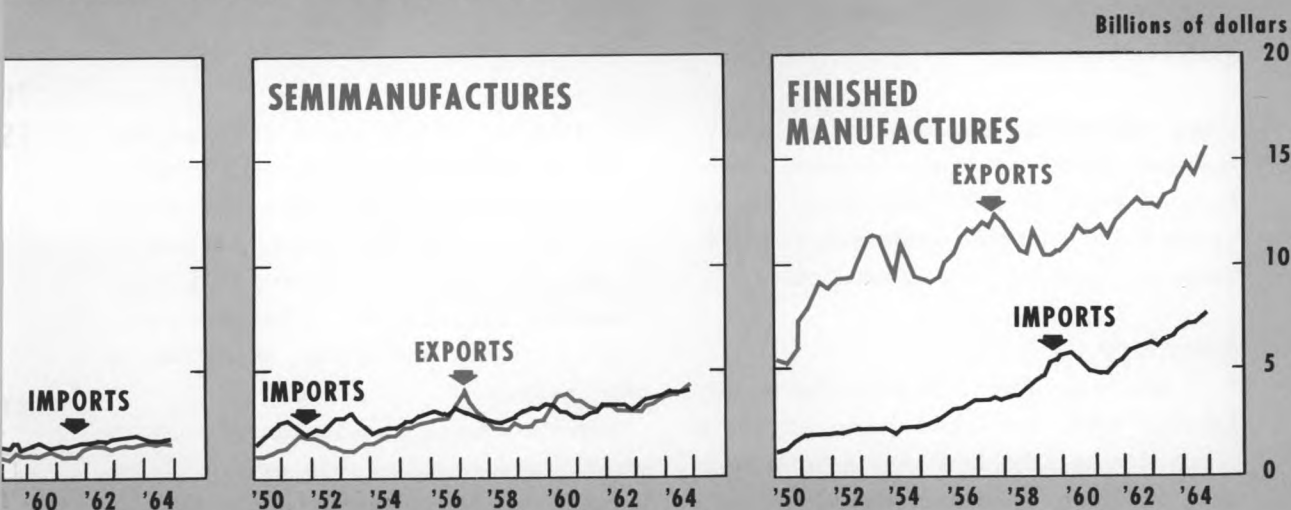
In 1954-55, exports of finished manufactured products failed to expand in part because of increasing competition from Western European suppliers in capital goods markets throughout the world. During the next two years, exports of U. S. finished manu-

factured products increased substantially because of three major economic conditions. First, the postwar dollar shortage in Western Europe had virtually disappeared and there was a liberalization of Western European import policies affecting capital goods. Second, a surge in U. S. direct investment abroad, especially in Western Europe and Canada, had a favorable impact on the demand for equipment built in the United States. Third, one of the largest customers for U. S. capital goods, Canada, experienced a rapid rise in economic activity, and increased takings of such goods.

The decline in shipments of finished manufactures in 1958-59 was due to a combination of adverse developments. In the earlier year, exports of capital goods declined because economic activity leveled off in a number of Western European nations and because Canada experienced an economic recession. India developed a serious balance-of-payments problem and, in reappraising its five-year plan, cut back imports of capital goods from the United States. Japan also encoun-

SEMIMANUFACTURES

FINISHED MANUFACTURES

Billions of dollars

20

15

10

5

0

EXPORTS

IMPORTS

EXPORTS

IMPORTS

IMPORTS

'60 '62 '64

'50 '52 '54 '56 '58 '60 '62 '64

'50 '52 '54 '56 '58 '60 '62 '64

tered difficulties in international payments, and introduced policies to dampen economic activity, which in turn restricted imports of industrial equipment. When Japan's economic activity again expanded at a rapid pace in 1959, investment demand was met in large part by machinery built in its own factories. Finally, the combination of a decline in U. S. direct investment and imposition of new import restrictions in Latin America caused a sharp drop in 1959 in shipments of capital goods to that part of the world.

In 1960-64, exports of finished manufactured products again rose rapidly. Capital goods were in demand as economic activity in Western Europe reached boom proportions and development programs in India and other Asian countries were augmented by extensive U. S. economic assistance. This demand led to sharply accelerated exports of U. S. industrial machinery and other manufactures which possessed substantial technological advantages and were otherwise competitive in design and price.

As shown by Chart 2, imports of finished manufactured products totaled $7.1 billion in 1964, more than quadruple the 1950 level. Imports of finished manufactures depended strongly on changes in the level of economic activity in the United States even more than did imports of semifinished products. As shown in the Appendix, a 10.0 percent increase (decrease) in industrial production has caused on the average a 19.5 percent increase (decrease) in imports of finished manufactures, or almost double the change in semimanufactured products. Furthermore, for the same level of industrial production, imports of finished manufactured products were $1.4 billion higher in 1958-64 than in 1950-57.

During the past seven years, the sharp upward shift in the volume of these imports was due to the rapid rise in U. S. economic activity and to the expansion of production facilities abroad. In concert, these developments enabled consumers, business establishments, and industrial concerns in the United States to purchase a wide range of foreign commodities, including cotton cloth, news-

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print, automobiles, and machinery. Briefly, the upward shift in imports of finished manufactured products points out clearly the increase in the competitive nature of, and U. S. tastes for, selected foreign products.

Summary

U. S. merchandise trade expanded rapidly between 1950 and 1964 principally as a result of trade in finished manufactured products, although semimanufactured products also contributed to the expansion. Trade relationships in finished manufactured products, however, accounted for the major portion of the over-all merchandise trade surplus.

Exports of finished manufactured products consisted in large part of shipments of capital goods which fluctuated widely because of changes in economic activity and U. S. direct investment abroad as well as balance-of-payments problems and import restrictions in other nations.

Imports of finished manufactured products were more diversified than exports. These imports clearly reflected changes that occurred in U. S. economic activity, and were higher for the same level of economic activity in 1958-64 than in 1950-57.

APPENDIX

Semimanufactures

As shown in Chart 3, data for U. S. imports of semimanufactured products are plotted as the dependent variable (Y) on a quarterly basis at seasonally adjusted annual rates in billions of dollars. Data for industrial production are plotted as the independent variable (X_1) as a quarterly average of the seasonally adjusted index.

The relationship between imports of semimanufactured products and industrial production for the period under review is derived from simple regression analysis. That relationship is shown by the following regression equation, commonly called the regression line:

$$Y_t = -0.094 + 0.030X_{1t} \ldots \ldots \ldots \ldots (1)$$
$$(0.161) \qquad\quad (0.001)$$

$$\bar{R}^2 = 0.89$$
$$Ex_1 = 1.03$$
$$F - \text{ratio} = 489.68$$
$$F_{.01} = 7.10$$
$$F_{.05} = 4.01$$

Inasmuch as time lags of one quarter or more do not improve the measures of precision in the regression analysis, both variables are measured in the same time period (t).

$\bar{R}^2$, the coefficient of determination adjusted for degrees of freedom, shows that 89 percent of the variance in imports of semimanufactured products is associated linearly with the variance in industrial production. The unexplained variance is due to other independent variables inasmuch as curvature in the data is not important.

The coefficient of the independent variable (X_{1t}), the regression coefficient, indicates that an increase (decrease) of 10 index points in industrial production has caused an increase (decrease) of $300 million in imports. Ex_1, the elasticity of the independent variable, or the ratio of the rate of change of the dependent variable to the rate of change of the independent variable, shows that a 10.0 percent increase (decrease) in indus-

trial production has caused on the average a 10.3 percent increase (decrease) in imports.

The figures in the parenthesis under equation (1) show one standard error[1] for the dependent variable and for the regression coefficient. The standard errors indicate clearly that the true values of both the dependent variable and the regression coefficient lie within reasonable limits of their calculated values in the regression equation for a valid analysis of the data. Moreover, the relationship between imports of semimanufactured products and industrial production is highly significant at the one percent level inasmuch as the F-ratio[2] is considerably larger than $F_{.01}$.

Finished Manufactures

The relationship between imports of finished manufactured products and industrial production is derived from multiple regression analysis. Imports are the dependent variable (Y) and industrial production is one of the independent variables (X_1). The variables are measured in the same respective

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[1] The standard error is a statistical measure that establishes the limits from the calculated values of the data within which the actual values lie.

[2] Analysis of data may suggest that there is a relationship between variables even though one does not actually exist. The F-ratio is a statistical measure that determines whether the relationship between variables is more than a chance relationship, which is the case in the above analysis.

[3] The dummy variable measures statistically the magnitude of the structural shift that occurred in the relationship of imports to industrial production. That is to say, a larger volume of imports became associated with a given level of industrial production. Such a structural shift takes place for a number of reasons, as cited in the text of this article.

units as those for semimanufactured products. To show the level of imports related to industrial production in 1950-57 as compared with that in 1958-64, the dummy variable[3] was added to the data as a second independent variable (X_2).

Imports as a function of industrial production and of the dummy variable are shown by the following regression equation:

$$Y_t = -4.269 + 0.075X_{1t} + 1.384X_{2t} \quad ..(2)$$
$$(0.253) \qquad\quad (0.003) \qquad\quad (0.099)$$

$$\bar{R}^2 = 0.98$$
$$Ex_1 = 1.95$$
$$F-ratio = 1374.53$$
$$F_{.01} = 5.00$$
$$F_{.05} = 3.16$$

The coefficient of determination shows that 98 percent of the variance in imports of finished manufactured products is associated linearly with the variance in industrial production. The coefficient of the independent variable (X_{1t}) indicates that an increase (decrease) of 10 index points of industrial production has caused an increase (decrease) of $750 million in imports, and the elasticity of the independent variable (X_{1t}) shows that a 10.0 percent increase (decrease) in industrial production has caused on the average a 19.5 percent increase (decrease) in imports.

All standard errors are reasonable and the relationship is significant at the one percent level.

In 1950-57 when the dummy variable (X_{2t}) is equal to zero, the relationship between imports and industrial production is:
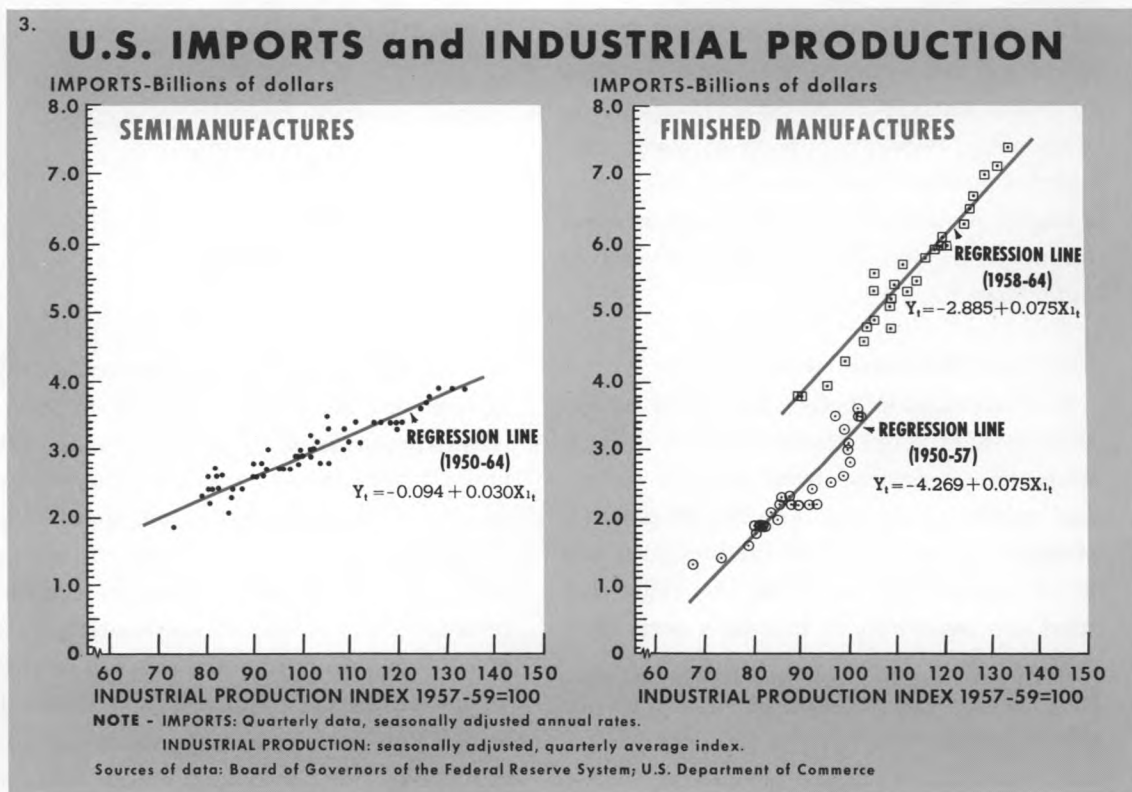
$$Y_t = -4.269 + 0.075X_{1t} \quad\dotfill (3)$$

In 1958-64 when the dummy variable (X_{2t}) is equal to one, imports as a function of industrial production are:

$$Y_t = -2.885 + 0.075X_{1t} \quad \ldots\ldots\ldots\ldots (4)$$

As shown by the difference in the constant terms in equations (3) and (4) and by Chart 3, imports of finished manufactured products related to a specific level of industrial production were \$1.4 billion higher in 1958-64 than in 1950-57.

3.

U.S. IMPORTS and INDUSTRIAL PRODUCTION

IMPORTS-Billions of dollars

SEMIMANUFACTURES

REGRESSION LINE (1950-64)

$Y_t = -0.094 + 0.030X_{1t}$

INDUSTRIAL PRODUCTION INDEX 1957-59=100

IMPORTS-Billions of dollars

FINISHED MANUFACTURES

REGRESSION LINE (1958-64)

$Y_t = -2.885 + 0.075X_{1t}$

REGRESSION LINE (1950-57)

$Y_t = -4.269 + 0.075X_{1t}$

INDUSTRIAL PRODUCTION INDEX 1957-59=100

NOTE - IMPORTS: Quarterly data, seasonally adjusted annual rates.

INDUSTRIAL PRODUCTION: seasonally adjusted, quarterly average index.

Sources of data: Board of Governors of the Federal Reserve System; U.S. Department of Commerce

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MONEY MARKET INSTRUMENTS

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SOME ASPECTS OF

DISCRETIONARY INCOME

A leading authority on the economics and psychology of consumer behavior has written recently of the rise in the United States of an affluent "mass consumption society". This development has been described as "a new and unique phenomenon in human history". The uniqueness is ascribed in part to the fact that a majority of families in this country now have available "discretionary purchasing power", which is used constantly to "replace and enlarge their stock of consumer goods".[1] It is the purpose of this article to discuss some aspects of discretionary purchasing power (income).

For many years, monthly estimates of *total personal income* prepared by the Department of Commerce have served as a measure of consumer income and purchasing power. Personal income includes all payments received by individuals, unincorporated businesses, and nonprofit institutions in the form of wages and salaries, profits, rent, interest, dividends, and transfer payments.

By deducting personal taxes from personal income, the Department of Commerce arrives at an estimate of *disposable personal income*. The latter series approximates the share of total income that consumers have available for purchasing goods and services.

In recent years, the National Industrial Conference Board has developed a "discretionary income" series, which measures the portion of personal disposable income that is available to the consumer to allocate at his whim and fancy.

Measuring Discretionary Income

Discretionary income is that part of disposable personal income that is left after deducting NICB estimates of (1) essential outlays, (2) fixed commitments, and (3) imputed income.

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[1] See George Katona, *The Mass Consumption Society*, McGraw-Hill Book Company, New York, 1964.

Essential outlays for food, clothing, household utilities, medical care, and transportation are netted out of disposable income estimates because they represent purchases that must be made if the consumer is to maintain a basic standard of living, and because the consumer has little if any choice in making such purchases.

Major fixed commitments — including such items as mortgage and instalment debt repayments, insurance and pension payments, and rent — are also deducted from disposable personal income, as they are long-term contractual obligations. Once undertaken, such obligations impose restrictions on consumers' allocation of current income.

Finally, and of smallest quantitative importance in dollar terms, estimates of imputed income and income in kind — which are derived by adding together such items as imputed net rent of owner-occupied dwellings, imputed interest, and the value of employees' lodging — are deducted from personal disposable income.[2] This deduction is made because such forms of income do not represent a cash flow to consumers, and therefore do not provide generalized purchasing power necessary for the acquisition of other goods and services.

What the Discretionary Series Reveals

As shown in Chart 1, the discretionary income series, expressed in constant dollars, has been characterized by a pronounced long-term rise, from about $83 billion in 1949 to an estimated $143 billion in 1964, a gain of nearly 75 percent. For the more recent 1960-1964 period, discretionary income — again expressed in dollars of the same purchasing power — increased by $26 billion, or about 22 percent.

The growth of discretionary income per member of the population is perhaps more pertinent, at least from the viewpoint of the individual. Since 1949, per capita discretionary income has increased by $197, or almost 36 percent, while since 1960, it has increased $102, or almost 16 percent.

Chart 2 demonstrates the more pronounced response, that is, the wider swings, of discretionary income to variations in general business conditions, as compared with the disposable personal income series. Since the most recent low point of economic activity in the first quarter of 1961, disposable personal income per capita, expressed in constant dollars, has increased by about 10 percent

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[2] For the consumer sector of the economy, income in kind refers to that portion of consumer revenue taking a non-monetary form. For example, in some industries, employees are provided free lodging and board by the employer, which is really a form of income to the employee; the employer could just as well raise an employee's money income by the amount of the rent and board and then ask for that amount to be returned.

Imputed income perhaps can best be explained by way of an illustration. Suppose individual A owns his own home, with no mortgage outstanding, while B rents a similar house for $100 a month. Further, suppose A

and B both earn $5,000 a year. In this example, A really has an income equivalent to $6,200 [$5,000+(12x $100)]. B must allocate $1,200 to rent, leaving $3,800 to be otherwise spent, while A can spend $5,000 on items other than housing. While A may thus enjoy a higher level of living than B, the $1,200 of imputed income does not provide him with generalized purchasing power and, consequently, is deducted from disposable income. Some liberties have been taken here in the interest of simplification: in real life, A would have to allocate part of his $5,000 for housing expenses such as taxes, repair, and maintenance.

1.
DISCRETIONARY INCOME

In Constant 1957-59 Dollars
Billions of dollars

Source of data: National Industrial Conference Board

in contrast to growth of approximately 16.5 percent in per capita discretionary income. The more marked advance in discretionary income during business expansion is due to the fact that as disposable income rises, the portion absorbed by spending on necessaries rises less, thereby leaving an increased proportion to be spent at the discretion of income recipients. On the other hand, during recession periods, reductions in discretionary income are relatively greater than those of disposable income. For example, during the recession period from the third quarter of 1957 through the second quarter of 1958, per capita discretionary income fell by 7.4 percent against a decline in per capita disposable income of only 2.8 percent. Such a pattern was also characteristic of the other recession periods shown in Chart 2. The greater response exhibited by the discretionary income series reflects the fact that essen-

tial outlays and fixed commitments continue largely unchanged, despite a reduction in disposable income, and that the brunt of reaction to a loss of income must therefore fall on consumers' discretionary or nonessential outlays.

With income levels an important determinant of spending patterns, consumer-oriented companies often use such measures of economic activity as Gross National Product and personal disposable income in making short-term sales projections. For producers of "luxury-type" goods and services, however, it seems that the series which measures the discretionary element of disposable income might be more relevant because the series measures the margin of current disposable income out of which relatively postponable outlays are made. To illustrate, a manufacturer of sporting goods equipment might find that sales of his company's products are rather closely associated with levels of discretionary income. This knowledge — supplemented by other information such as that already noted concerning the behavior of discretionary income over the course of the business cycle — could be useful to the manufacturer in forecasting his company's sales over the next half-year or so.

At this point it might be helpful to discuss in detail an application of the discretionary income series to short-term sales forecasting. Before beginning this discussion, however, it should be noted that forecasting is a complicated process, which demands a great deal of the analyst. While forecasters make use of a number of statistical methods and techniques, adherence to any rigid statistical approach is not necessarily the trademark

2.
PERCENTAGE CHANGES IN PER CAPITA DISCRETIONARY INCOME AND DISPOSABLE INCOME
In Constant 1957-59 Dollars

Source of data: National Industrial Conference Board
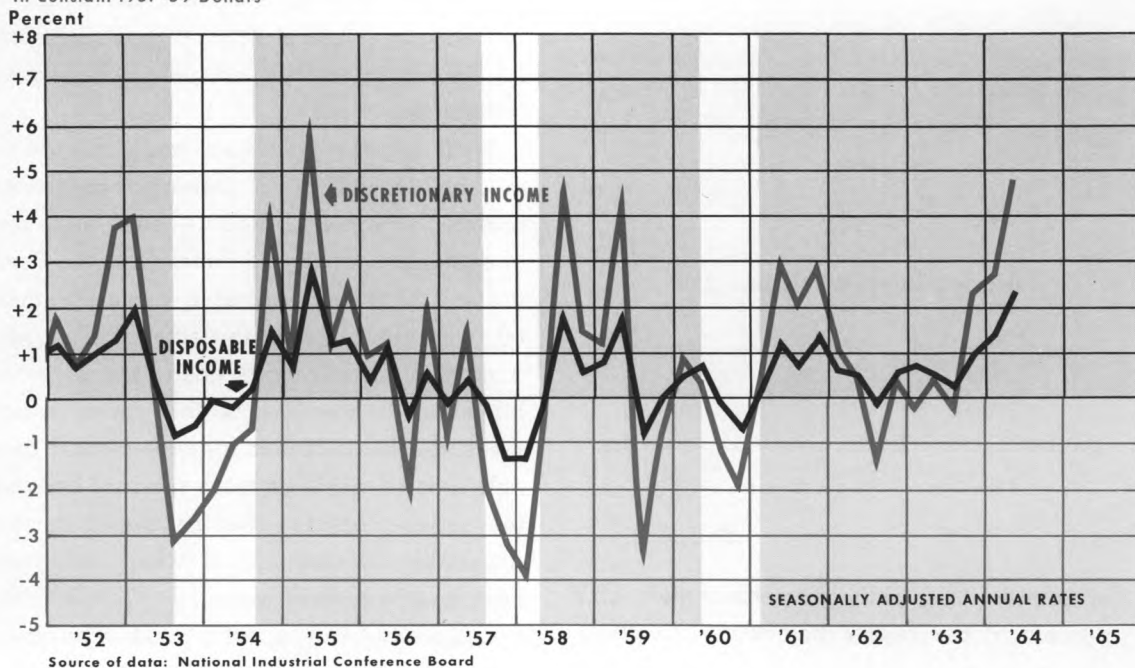
of a good analyst. In addition to statistical techniques, an analyst should apply to the problem the knowledge gained through experience and familiarity with his product, company, industry, and the economy.

An Illustration

The following example is not meant to illustrate a "proper" forecasting approach; it is intended only to demonstrate in broad outline, making use of the discretionary income series, a commonly used statistical approach to short-term forecasting for a particular product.

For purposes of illustration, let us imagine a hypothetical "luxury-type" product called

an "instant-wakeup-machine". A forecast of sales of instant-wakeup-machines over the next year is to be made for the ABC Manufacturing Company.

Let us further suppose that data are available for the number of instant-wakeup-machines sold by an entire industry as well as for discretionary income, expressed in constant dollars, for the past ten years. These hypothetical data appear in Table I.

From what has been said, it should be expected that a relationship exists between the number of units of instant-wakeup-machines sold and levels of discretionary income. Specifically, the data should show that increases in the number of units sold are associ-

ated with increases in discretionary income. The relationship between the two will not be precise, since innumerable other factors exert an influence on sales of instant-wakeup-machines. However, the relationship plotted in the top panel of Chart 3 is sufficiently close to be of use in forecasting sales for the coming year.

By sketching a free-hand line it is possible to express what seems to be the average or typical relationship between the volume of discretionary income and the number of instant-wakeup-machines sold in a year. Many analysts would prefer to use a mathematically derived line to indicate the relationship, while others prefer merely to let their eyes do the work. A line representing this relationship is superimposed on the basic data in the lower panel of Chart 3, and gives some idea of the "normal" relationship between discretionary income and sales of instant-wakeup-machines.

The next step is the difficult one of forecasting next year's level of discretionary income. Some business forecasters might prefer not to make their own estimate, but would rather use the forecasts of discretionary income prepared by others, such as, for example, the NICB since it is the latter's series. If such an estimate of discretionary income is not available for the period desired, business analysts might use forecasts of disposable income, which are more readily available, and from these estimate discretionary income. In this illustration, the latter procedure is used.

Let us assume that most forecasts for next year center around a disposable income of $406 billion in constant dollars, and assume

TABLE I
An Illustration

Year	Number of "Instant-Wakeup-Machines" Sold	Discretionary Income (billions of constant dollars)
1	40,000	82.0
2	38,250	85.0
3	46,500	93.0
4	48,900	104.0
5	53,300	111.0
6	51,500	112.0
7	58,350	119.0
8	59,050	123.0
9	61,100	130.0
10	67,000	138.0
11	?	?

3.
DISCRETIONARY INCOME AND "INSTANT-WAKEUP-MACHINES"
Hypothetical Figures

UNIT SALES IN THOUSANDS OF "INSTANT-WAKEUP-MACHINES"

DISCRETIONARY INCOME IN BILLIONS OF CONSTANT DOLLARS
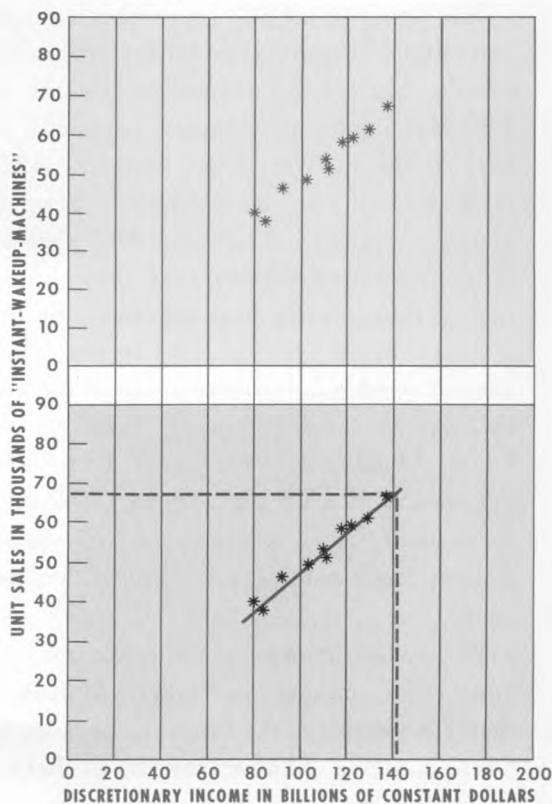
further that discretionary income is on average about 35 percent of disposable income. This would then provide a predicted level of discretionary income of $142 billion (.35 x $406 billion) for next year. (It should be noted that no knowledgeable forecaster would arrive at an estimate of future discretionary income in such a mechanical fashion.) With $142 billion, the figure to be used, the analyst would now, on the basis of the line of average relationship, observe the number of units of instant-wakeup-machines associated with this level of discretionary income. As seen from the lower panel of Chart 3, a level of discretionary income of $142 billion is associated with the sale of 67,500 instant-wakeup-machines on average.

This figure of 67,500 represents a prediction of total industry sales for the next twelve months, but not the amount of sales for the ABC Manufacturing Company, which, in this case, is the analyst's main concern. ABC's sales volume can be estimated, however, once the relationship between ABC's sales of instant-wakeup-machines and those of the rest of the industry is determined. Assume that on average over the past five years, ABC has achieved a 25 percent share of the market, that is, its sales amount to about one-fourth of total sales in each year. From this, it follows that if a 25 percent market share is maintained, ABC will sell 16,975 instant-wakeup-machines ($\frac{1}{4}$ x 67,500) in the next year.

The actual number of units sold may not equal the amount projected; forecasting rarely is precise to the last unit. Because the future contains unknown events, all that can be reasonably asked of the forecaster is an "educated" estimate, based on the best information available.

Business Cycle Analysis

Aside from use in predicting short-term demand for particular industries, the discretionary income series may also have value as a forecasting tool to be used in business cycle analysis. As already mentioned, measures of discretionary income are more sensitive to general business conditions than are measures of personal disposable income. Sensitivity to changes in the business climate is a desirable characteristic for a series used in business cycle analysis.

The greater responsiveness of discretionary income is evident in Chart 4 (a similar pattern is found in Chart 2). Periods of recession are reflected in the disposable personal income series more by a leveling-off in the rate of expansion than by actual declines. The discretionary income series, on the other hand, declines sharply during a recession — even one as mild as that in 1960 — and this is helpful to the analyst.

It is also interesting to note, on the basis of Chart 4, that the discretionary income series usually declines in the same quarter that general business activity reaches a peak. Thus, after periods of cyclical rise, discretionary income declined in the third quarters of 1953 and 1957 — the same quarters in which general business activity reached peak levels. This relationship, however, did not appear with the peak in economic activity reached in May 1960. At that time discretionary income began a cyclical decline in the quarter following that in which the recession began. In any case, it does seem that discretionary income

4.

INDEXES OF DISCRETIONARY INCOME AND DISPOSABLE INCOME

In Constant Dollars

INDEX 1957-59=100
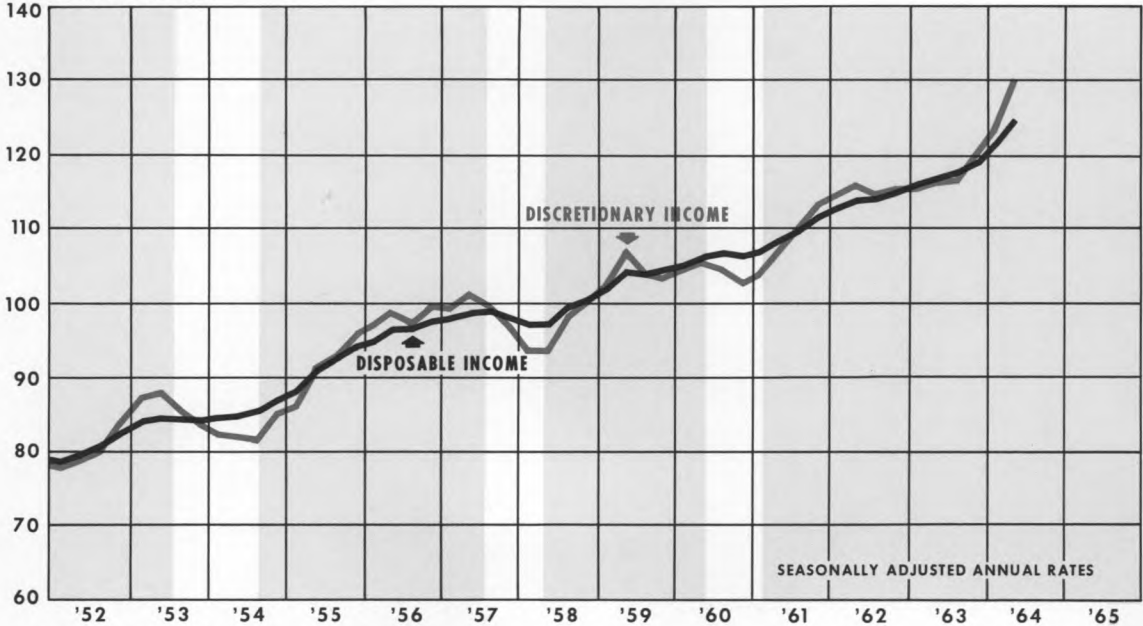
Source of data: National Industrial Conference Board

declines at or about the same time that cyclical highs are reached. The pattern of cyclical behavior of disposable income does not demonstrate a similar movement. Instead, declines in disposable income tend to occur only after a peak in general business has been reached. It thus can be tentatively concluded that the NICB's discretionary income series may be a useful measure when verifying peaks in general economic activity.

Long-Term Use Requires Caution

While measures of discretionary income may be useful for purposes of short-term market and business analysis, caution should be exercised in using the series to make long-term comparisons and projections. The NICB prepares the series with the short run in mind and various adjustments must be made by the user before it can yield meaningful answers to the many questions concerning long-term changes in the consumer sector as well as in the economy at large.

Fourth Federal Reserve District