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**Part Three**  
**STAFF REPORTS**



## STAFF REPORTS

### 1 NATIONAL INCOME AND CAPITAL FORMATION

#### CAPITAL FORMATION AND FINANCING IN THE UNITED STATES

This inquiry was initiated in mid-1950 at the request of and with a grant from the Life Insurance Association of America. It is designed to establish the trends in the accumulation of capital in the various sectors of the economy, and in the types and sources of funds by which the accumulation was financed; to analyze the factors which governed such trends in capital formation and financing; and to evaluate these factors in their bearing upon prospects for the longer-range future.

The project includes studies concerned with the several major capital-using sectors of the economy — agriculture, manufacturing and mining, transportation and public utilities, residential and related real estate, nonprofit institutions, government, and demand from abroad; with the intermediate financial institutions, which channel the funds; and with the broader, countrywide aggregates that provide the quantitative framework within which the shifts and interrelations among the various sectors can be examined. This investigation is related to and draws upon Raymond Goldsmith's study of savings since 1897, begun in 1948 under the auspices of the Life Insurance Association of America, and now nearing completion.

Reports for the several studies that form parts of the inquiry follow.

#### *Agriculture*

Our first job was to assemble available estimates and, where necessary, make new estimates of the values of the main types of physical assets used in farming, by states and regions, for census years, 1870-1950. Many of the valuations could be obtained from reports of the Bureau of the Census and of the Bureau of Agricultural Economics; but to make the data reasonably comprehensive and comparable throughout the eighty-year span, it was necessary to prepare additional estimates for

series that covered only a part of the period, and to develop some new series. Both current- and constant-price valuations of the physical assets have been prepared.

In 1870 the investment in four major classes of physical assets used in farming (land and buildings, machinery, livestock, and stored crops) amounted to nearly 12 billion current dollars. Despite generally falling prices of farm products during the next twenty years, the value of these physical assets grew to 17 billion in 1890. Then, spurred by rising prices, it rose at an accelerated rate, reaching 84 billion dollars by 1920. From this war-inflated level the value of farm physical assets declined sharply, first in the early twenties and again in the early thirties. By the beginning of 1935 the total had shrunk to 40 billion dollars, less than half of the 1920 amount. Subsequently it increased, and by 1950 stood at 110 billion dollars — nearly a third higher than in 1920.

These wide fluctuations were largely the result of a shifting standard of value. When the valuations are expressed in constant prices, it appears that the physical assets of agriculture increased steadily until 1920, and thereafter fluctuated within comparatively narrow limits.

With one exception, the proportion of total physical capital represented by each major type varied surprisingly little for the United States as a whole. Throughout the eighty-year span, land and buildings represented about 70 to 80 per cent. Livestock, in most years, represented about an eighth, and stored crops about a twentieth of the total. Only in the case of machinery (including automobiles, tractors, and motor trucks) did the proportion change decisively — from 3 per cent to 13 per cent between 1870 and 1950. These proportions varied somewhat among regions. In regions that were settled principally after 1870 the proportions changed sharply from decade to decade before relative stability was reached.

In addition to the preparation and partial analysis of data representing farm physical assets, we have adjusted census enumerations of persons engaged in agriculture, 1870-1950, so as to provide reasonably comparable regional data on the farm labor force. We have also, for selected years, prorated to states and regions the estimates of gross farm income of the United States made by Strauss and Bean, and have tied these to similar estimates for later years made by the Bureau of Agricultural Economics.

The preparation of these data makes possible studies of the relation of farm capital to labor force and to output on a regional basis. Such studies, together with an examination of the factors that influenced the growth of farm capital, including the sources of the savings that made growth possible, remain to be made.

Alvin S. Tostlebe

### *Manufacturing and Mining*

The work of gathering and processing data has progressed. The ratio of the stock of physical capital to annual output, and related ratios, have been computed by minor industries in mining and manufacturing for census years 1869-1919 and for 1929, 1937, and 1948. Adjustments for price changes in the capital and output figures have been completed only through 1919. Preliminary analysis of this period clearly indicates that in most minor industries the capital-output ratio was rising. In the light of this finding, the rising capital-output ratio derived from aggregate data cannot be attributed merely to a shift from less intensive to more intensive capital-using industries. Rather it was a widespread tendency among individual industries.

In the near future we shall complete the price adjustments for the period following 1919. Our analysis will attempt to focus on the real and financial aspects of the problem: that is, on the factors that have conditioned the trends in the capital-output ratio, and the probable force with which these factors may operate in the years ahead; and on the trend in sources of capital funds and the probable future sources of capital.

Israel Borenstein  
Daniel Creamer

### *Transportation and Public Utilities*

Preparation of the statistical background required for the study of long-term trends in capital formation in the transportation and public utilities industries meant, chiefly, constructing new series over the period 1870-1950 on gross capital expenditures, capital consumption, net capital expenditures, and the stock of capital, both in current and in constant dollars. This portion of the work has been completed for steam railroads, electric light and power, and street and electric railways—groups which in the aggregate have recently accounted for about 70 per cent of the investment of all public utilities and transportation industries, and for about 20 per cent of all private business investment.

It is of interest to note that the three industries thus far covered are in rather widely different stages of development. Street and electric railways experienced their greatest rate of expansion in 1890-99, and the industry's physical plant has been contracting since 1908. Net capital formation in steam railroads was at a maximum in 1905-14, and this industry's stock of physical capital has, on balance, been contracting since 1931. Electric light and power, unlike the others, is still in the expansionary stage, though its most rapid rate of growth was in the twenties.

It must be borne in mind, however, that such references to rates of growth bear especially on *net* capital formation. A substantial flow of investment goods may, of course, be required even by an industry whose period of growth appears to have ended, so long as the need exists for its continued operation. Thus, to meet capital consumption alone the steam railroads currently require capital goods to the amount of 500 millions of 1929 dollars per annum — a sum more than half as great as their net rate of annual growth during the period of maximum expansion.

Plans for the coming year include the compilation of similar but somewhat less detailed series for the remaining public utilities and transportation industries, including communication, gas utilities, water transportation, trucking, and a few others; and, for all industries in this segment, the construction of financial data required for study of the sources and uses of funds in selected time periods.

Melville J. Ulmer

#### *Residential and Related Real Estate*

Collection and analysis of available data on real capital formation and capital funds in the field of housing were substantially completed during 1951. In addition, new estimates of residential construction for about 1890 to 1915, on the basis of hitherto unused building permit data compiled in a WPA project, are nearing completion. Rough estimates have also been prepared for the flow of equity and mortgage funds into residential construction, 1915 to date, and will be extended into earlier periods.

Consumer demand has a direct bearing on capital formation in this field. The analysis of real capital will therefore proceed from long-term growth factors that influence the number of new dwelling units built to those that affect real capital per unit and the ratio of production to stock. Another approach to the projection of capital requirements is through long-term changes in current consumer expenditures for housing and in the capital-output ratio. Finally, long-term changes in the importance of residential construction in the national economy will be reviewed in the monograph under preparation.

The analysis of capital funds will deal with secular changes in the sources of funds and in cost and terms of mortgage loans, as well as with the increasingly important role of the federal government in mortgage financing.

Tentative results to date may be summarized as follows:

There appears to have been a decline in real construction expenditures per dwelling unit at least since 1920. The extent to which this

decline is due to an upward bias in construction cost indexes still remains to be investigated. The decline in real capital per unit as now shown is the net result of downward pulls through increases in productivity, and possibly through a decline in the average size of new dwelling units and in standards of construction, as against upward pushes exerted by more equipment and facilities and a larger proportion of single-family houses. The ratio of dwelling units built to units standing and the ratio of new construction expenditures to the value of residential real estate (in constant prices) show a secular decline since about 1900.

Current consumer expenditures for housing appear to have exhibited a downward trend in relation to total consumer expenditures and income even before the forties, when the decline was accentuated by rent control. The capital-output ratio, defined as the relationship between the value of residential real estate and annual gross rent (actual and imputed), has had a falling trend since about 1890, but conceptual and statistical difficulties limit its usefulness for projection purposes.

According to tentative estimates, equity funds accounted for about one-half of total expenditures for construction and land from 1915 to 1920 and for about one-third during the twenties. Their relative importance increased again during the thirties but fell to one-quarter during the late forties. These results indicate a larger proportion of equity financing in the acquisition of new residential real estate than has often been assumed.

The share of total residential mortgage debt held by noninstitutional lenders has shown a secular decline since the turn of the century. All of the major institutions except mutual savings banks increased their proportion of total holdings.

Leo Grebler

### *Nonprofit Institutions*

The immediate objective of our study is to obtain estimates of the value of real and financial assets held by the private nonprofit institutions in the United States for selected years during 1890-1950. The institutions with which we are dealing make up what may be described as the 'nonprofit, nongovernment' sector of the economy. A preliminary estimate places the value of the real and financial assets of private nonprofit institutions in 1949 at about 22 billion dollars. Of this amount, approximately 44 per cent was owned by religious bodies, 23 per cent by private secondary and higher educational institutions, 16 per cent by private nonprofit hospitals, 12 per cent by foundations, and approximately 5 per cent by other organizations.

To date we have completed estimates of the assets held by educational



institutions and hospitals in the United States. Since any attempt to explain the trends in nonprofit wealth has as its prerequisite some knowledge of the trends in the assets held by the business and government institutions offering services similar to those provided by the 'nonprofit, nongovernment' organizations, we have extended the estimates to include the value of assets held by public educational institutions, publicly controlled hospitals, and the proprietary hospitals operating on a business basis.

Robert Rude

### *Government*

The analysis of government requirements for capital presents a special problem, because government borrowing has at times been used to finance expenditures that do not represent physical capital formation, and because government capital formation expenditures have not infrequently been financed out of current receipts. Accordingly our attention has been directed mainly toward an examination of fiscal history that relates total government expenditures and receipts to changes in debts, cash balances, and portfolios.

Two work memoranda have been prepared. 'Federal Financing during World War I and the 1920's' traces the growth of federal debt during the war and its partial repayment during the decade following. This memorandum appraises factors affecting the possibilities of a pay-as-you-go policy and of a debt repayment policy; indicates changes in federal functions, including the beginnings of federal credit agencies and social insurance funds; and notes developments in the fiscal procedures of legislative control and administrative management.

The second memorandum, 'An Outline of Developments in Governmental Financing since 1890,' emphasizes state and local problems. Some of its tentative conclusions are: that temporary fads of caution appear to have been more important than legal restrictions and restraints on excessive borrowing; that there has been a significant year-to-year correlation between state and local financing and capital expenditures, but no clear decade-to-decade correlation; and that there has been a marked growth of the financial dependence of local units on states, and of states on the federal government.

A study of federal financing during the 1930's has just been started, following an interruption because of my absence from the country for six months. Two other principal work memoranda are contemplated: one on federal financing since 1940, the other on the present status of government debts in the light of fiscal history in recent decades.

Morris A. Copeland

### *Foreign Demand for Capital*

The year's work consisted largely of assembling and organizing statistical data on capital movements, since about 1870, across the borders of the United States, the Netherlands, France, and Germany. While our interest is concentrated on the experience and prospects of the United States, it is expected that our understanding of the determining factors involved will be deepened by review of the experience of other countries, and we intend to extend the list during the coming year. We will conclude, also, the assembly and review, already initiated, of the estimates of future foreign capital 'requirements' or 'needs' prepared by various agencies and economists.

Some highlights of the experience of the United States may be summarized briefly:

1) The shift in our international capital position, from debtor to creditor nation, which came so dramatically during World War I, in fact had long roots: the shift was already being bred by economic developments during the nineteenth century; the war hastened its appearance.

2) Even more than domestic investment, foreign investment seems to be a highly sensitive process influenced by great waves of speculative interest. For superimposed on the trend of net capital movements across United States borders are fluctuations of great amplitude and long duration, approximately twenty years to a cycle, as well as the smaller fluctuations one expects to find.

3) In some periods, therefore, net capital imports have been fairly substantial compared with domestic savings, averaging 11 per cent of domestic savings during 1869-77, for example; but taken over longer periods, net capital imports have been modest measured against the standard of domestic savings, averaging less than 3 per cent during the half century between 1850 and 1900. As the United States was a major capital importer during the nineteenth century (perhaps a fifth or even a fourth of the world's foreign investments of 1900 were in this country), the low ratios largely reflect a high level of domestic savings; which in turn suggests that the circumstances making for high domestic savings are a concomitant of — perhaps a condition for — large capital imports.

4) The capital exports of the United States also have fluctuated widely. They averaged about 10 per cent of domestic savings during the boom of the 1920's, and in some years of that decade they were, of course, much higher relative to domestic savings.

5) Apart from government loans, largely associated with the two

wars, our investments abroad have been concentrated in direct investments by American companies in enterprises controlled and operated by them, nearly half going into extractive industries. Foreign bonds were attractive to American investors only during the 1920's and since then have largely been liquidated. Our investments in foreign-controlled private enterprises have been relatively small.

6) About two-thirds of our private long-term investments abroad have been concentrated in the Western Hemisphere, with Canada outstanding in importance.

Solomon Fabricant

### *Financial Intermediaries*

The study of financial intermediaries is intended to provide a bridge between the study of saving on the part of individuals, business, and government in which I have been engaged for the last three years in connection with a project sponsored by the Life Insurance Association of America, and the National Bureau's project dealing with the requirements for and use of capital funds by the main sectors of the American economy.

My present study is specifically concerned with the role of financial intermediaries in the flow of funds between suppliers and users. It deals with the amount of funds which the different types of financial intermediaries have received and disbursed during the last fifty years; with the ultimate sources and the final recipients of these funds; with the number, size, location, and concentration of the different types of financial intermediaries; with the methods used in collecting and distributing these funds; with the forms of the incoming and outgoing streams of funds, the price at which the funds have been solicited and supplied, the way in which the different types of financial institutions have operated, and the cost at which they have performed their services in the capital market.

The main statistical building stones required in the study are:

1) Statements of aggregate assets and liabilities and their distribution by type, on the basis of a standardized classification, for each of about twenty groups of financial intermediaries at eight benchmark dates (1900, 1912, 1922, 1929, 1933, 1939, 1945, and 1949).

2) Statistics of changes between benchmark dates in the book value of holdings of all main types of assets of the groups of financial intermediaries covered by the study; also of net purchases and sales for selected types of assets and financial intermediaries.

3) Comparison of total amounts of different types of assets and lia-

bilities outstanding at benchmark dates with amounts held by various groups of financial intermediaries.

4) Summaries of sources and uses of funds by main types of financial intermediaries for periods between benchmark dates.

5) Data on the gross flow of funds in recent years for selected types of assets and selected groups of financial intermediaries.

6) Data on the number, size (number of units, offices, and employees), geographic distribution, concentration, and interrelationships, for the main groups of financial intermediaries.

Work on this project started on a small scale late in 1950 and proceeded on a part-time basis so far as my own contribution is concerned. By the end of 1951 collection of data had been brought near to completion for all items but 4 and 6. The work on item 3 consisted mainly of a new set of estimates of the value of stock outstanding at benchmark dates, distinguishing the stocks of the main industries, and common and preferred stocks. In the field of item 6 statistics of the number, geographical distribution, and interrelationship of investment bankers and security dealers as of 1913 and 1929 were prepared on the basis of trade directories. Under present plans the final report will deal with three topics:

Trends in capital market organization

Net flows of funds through financial intermediaries, 1900 to 1949

Structure of assets and liabilities of main types of intermediaries

Share of intermediaries in main types of assets and liabilities

Net flow of funds through main types of capital market investments

Gross flows of funds, 1947 to 1949.

Raymond W. Goldsmith

### *General Studies*

My work during the year has been largely concerned with (a) explorations of the general framework within which analysis of long-term trends in capital formation and financing could most effectively be carried on; (b) extension, revision, and preliminary analysis of the countrywide aggregates of national product and its components, in order to provide a quantitative framework within which the statistical results of the separate studies could best be summarized.

Work under (a) resulted in several papers, all of which are still in mimeographed form but some of which may be published soon. These are 'Capital-Product Ratios and Technological Change,' presented at the Conference on Measurement of Technological Change held at Princeton in April 1951; 'Basic Concepts and Assumptions in Long-Term Projections of National Product,' submitted to the Conference

on Research in Income and Wealth in May 1951; 'Long-Term Changes in National Product of the United States since 1870,' submitted at the 1951 meeting of the International Association for Research in Income and Wealth (to be published in Cambridge in 1952, together with a parallel paper by Raymond Goldsmith on long-term changes in wealth); and 'Proportion of Capital Formation to National Product,' presented at the December 1951 meetings of the American Economic Association. In addition several working memoranda were prepared, with a view to mapping out the summary volume of the study or dealing with special technical problems.

Work under (b) involved, first, attempts to derive an annual series of national product which would free the analysis from dependence upon the overlapping decade estimates already available; and, second, extending the series to date, so that it would be possible to have the statistical analysis of the aggregates carried through from 1869 to 1950. In the process, minor revisions of the earlier estimates were made; and more may have to be made after the results of the statistical work in connection with the various sector studies become available.

The preliminary suggestions which these explorations yield may be summarized under three heads. First, the major limiting factors on the secular levels of the proportion of capital formation in national product seem to be not on the side of investment opportunity but on the savings side — i.e., factors that limited the ability and willingness of ultimate consumers (or of other saving agencies) to save. With rather low ratios of saving to income, the factors that made for rapid economic progress seem to lie in the efficiency with which savings were channeled into productive investment uses; in the effect of high and rapidly growing consumption levels on the efficiency of the population; and in the favorable position of the United States with respect to natural resources and freedom from wasteful international pressures. Second, there is some indication that the rate of savings has sustained a secular decline since the end of the nineteenth century; and the factors involved may be such as to warrant expectation of further decline — with whatever implications this may have under various assumptions concerning the general conditions under which the economy will operate in the future. Third, the rate of secular increase in national product and in several major components has exhibited marked swings of a duration of about twenty years — and not, except during the decades after World War I, synchronous in timing with the long swings in residential and related construction. Any consideration of long-term prospects must be made in cognizance of the existence of such swings in the past and the likelihood of their recurrence in the future.

Simon Kuznets

CONFERENCE ON RESEARCH IN INCOME AND WEALTH

*Volume Thirteen of Studies in Income and Wealth*, containing papers on the size distribution of income, was published in April, and *Volume Fourteen*, containing papers on the analysis of wealth, was published in December. *Volume Fifteen*, which also contains papers on the size distribution of income, will soon be ready for publication. Two additional volumes of proceedings are now being prepared. One, on long-term projections, the topic at the May 1951 meeting in New York, is being edited by Richard Ruggles and is expected to include the following papers and related discussion:

- Concepts and Assumptions in Long-Term Projections of National Product, by Simon Kuznets
- Projections of Labor Force and Labor Input, by Harold Wool
- National Productivity and Its Long-Term Projection, by John Kendrick
- Long-Term Projections of Private Capital Formation, by William J. Fellner
- Problem of Estimating Spending and Saving in Long-Range Projections, by Mary Smelker
- Specific Industry Output Projections, by Harold J. Barnett
- Productive Capacity, Industrial Production, and Steel Requirements, by Paul Boschan
- Projections in Agriculture, by James P. Cavin
- Regional and National Product Projections and Their Interrelations, by Walter Isard and Guy Freutel
- Projections of the International Sector of Gross National Product, by J. J. Polak

The second volume, on short-term projections, the subject of the September 1951 meeting at the University of Michigan, is being edited by Lawrence Klein, and will, it is hoped, contain:

- Recent Developments in Short-Term Forecasting, by V. Lewis Bassie
- Business Investment Programs and Their Realization, by Irwin Friend and Jean Bronfenbrenner
- Investment Forecasting in Canada, by O. J. Firestone
- Economic Expectations and Plans of Firms in Relation to Forecasting, by Franco Modigliani and Owen H. Sauerlender
- Forecasts of Freight Movements, by Thor Hultgren
- Newly Available Orders Data in Relation to Forecasting, by Walter Jacobs
- Contribution of Consumer Anticipations in Forecasting Consumer Demand, by Irving Schweiger

Analysis of Consumer Demand from Repeated Interviews and Reinterviews, by John B. Lansing and Steve B. Withey  
Federal Budget in Relation to Forecasting, by Carl Blackwell

Irwin Friend's study of the composition of individuals' savings has been completed and is being reviewed by the Conference's advisory committee.

The Conference has appointed a committee to advise on a new study based on the continuous file of Delaware individual income tax returns from 1925, a study being conducted under the auspices of the Bureau of Business Research of the University of Delaware. The advisory committee consists of Selma Goldsmith, *Chairman*, William Vickrey, James Tobin, and Thomas Atkinson.

The next meeting of the Conference, planned for the autumn of 1952, will deal with input-output analysis. The program is being arranged by a committee consisting of Raymond Goldsmith, *Chairman*, John Norton, and Wassily Leontief.

Tentative plans have also been made for a meeting on capital formation to be held in 1953. The members of the program committee are Franco Modigliani, *Chairman*, Solomon Fabricant, and George Jaszi.

Dorothy S. Brady, *Chairman*

#### OTHER STUDIES

Morris A. Copeland's book, *A Study of Moneyflows in the United States*, and Simon Kuznets' *Shares of Upper Income Groups in Income and Savings* are in press. Thomas Atkinson has begun a study of the distribution of wage and salary incomes (see Part Two). Other studies of income are reported by Wolman in Section 2 and by Creamer, Hultgren, and Klein in Section 3. Several studies of investment are reported in Section 4; see also Hastay's report in Section 3 and Miss Hartland's report in Section 6.

## 2 WAGES, EMPLOYMENT, AND PRODUCTIVITY

### WAGES

The leveling of personal incomes in recent decades, which has been noted in studies of the distribution of income, has a striking counterpart in the comparative behavior of the wages paid to skilled and unskilled labor. Since 1939, as the following table shows, the wage rates of unskilled labor, especially on the railroads and in construction, have moved up steadily on the rates of the skilled, so that by 1951 the differ-

entials between the wages of these two classes of labor had strikingly narrowed. The same type of movement took place in manufactures, but there the change seems less striking, probably because we have no available measure of the wages of the skilled, separate from the wages of the semiskilled.

#### UNSKILLED WAGE AS PERCENTAGE OF SKILLED WAGE, 1914-1951

YEAR	MANUFACTURES <sup>a</sup>	RAILROADS <sup>b</sup>	CONSTRUCTION <sup>c</sup>
1914	69.8	37.6	31.3
1920	77.0	54.5	55.1
1929	72.8	38.6	40.2
1939	73.5	37.5	47.4
1951	78.3 <sup>a</sup>	68.2 <sup>b</sup>	60.8 <sup>c</sup>

<sup>a</sup> National Industrial Conference Board. Ratios are hourly wages of unskilled to hourly wages of skilled and semiskilled. This series was discontinued in 1948, hence the last entry represents the average for the first 7 months of that year.

<sup>b</sup> National Industrial Conference Board, through June 1949; thereafter, reports of the Interstate Commerce Commission. The last entry is the average for the first 8 months of 1951.

<sup>c</sup> *Engineering News-Record*: last entry is average of first 11 months of 1951.

Apparently, the same process of leveling was observable in World War I. The relative gains of the unskilled were not held, however, between the wars; in the case of railroad labor, the relative wages of the unskilled were in 1939 back to where they had been in 1914. By 1951 railroad unskilled labor had more than recovered this loss in position.

A record of great and interesting divergencies in the changing position of different classes of labor is shown in the next table, which reflects the disparate movements of farm and of factory wages. Throughout the period of World War I the two moved closely together; after World War I, the wages of farm and factory labor moved farther and farther apart. Some of this gap has been closed since 1939, but even in 1948 it was still wide.

#### RATIO OF DAILY WAGE RATES (WITHOUT BOARD) OF FARM LABOR TO HOURLY EARNINGS OF FACTORY LABOR (1914:100)<sup>a</sup>

1914	1920	1929	1933	1939	1948
100	98.2	67.1	43.0	38.7	66.0

<sup>a</sup> Hourly earnings of factory labor, U.S. Bureau of Labor Statistics; wage rates of farm labor, U.S. Bureau of Agricultural Economics.

The causes of these phenomena have been little studied, though some of them are reasonably clear. Thus, between 1920 and 1939 the wages of farm labor reflected the prolonged and severe agricultural depres-



sion, while factory labor profited from the prosperity of the twenties and the great expansion of organized labor in the thirties. In the two World Wars unskilled labor was probably favored by labor unions and public policy, which seemed disposed to lift the wages of the unskilled faster than those of the skilled. Of course, the episode of World War II is probably not yet completed; the depression of 1929, it will be recalled, followed fifteen years after the beginning of World War I. What would happen to wage differentials if we were again to face major setbacks in business can only be a matter of conjecture.

A recent study of the relation of the wages of the skilled and unskilled in England, partially summarized in the next table, discloses much the same type of changes as in the United States. Differentials narrowed appreciably during World War I. They widened after the war. By 1950, the gap was again tightly closed.

UNSKILLED WAGE AS PERCENTAGE OF SKILLED WAGE IN ENGLAND,  
1914-1950<sup>a</sup>

YEAR	BUILDING	SHIPBUILDING	ENGINEERING	RAILWAYS
1914	66.5	55.2	58.6	54.3
1920	81.0	77.2	78.9	81.2
1929	74.7	68.0	71.3	65.2
1939	76.3	73.4	75.6	61.5
1950	84.1	81.7	84.7	77.4

<sup>a</sup> K. G. J. C. Knowles and D. J. Robertson, 'Differences between the Wages of Skilled and Unskilled Workers, 1880-1950,' *Bulletin*, Oxford University Institute of Statistics, April 1951, p. 109.

Leo Wolman

#### THE LABOR FORCE

My manuscript, now being revised, studies the labor force of Great Britain, Canada, New Zealand, Germany, and the United States during periods ranging up to a century or more, and pays especially close attention to its structure as among large cities, urban-rural areas, and income groups in this country since 1890. The revision will benefit from three official counts of population and the gainfully occupied, conducted during the last year or so in the United States, Canada, and Great Britain — for the latter, the first in twenty years. So far, reexamination of the material has not modified my earlier findings that the peacetime labor force, as a proportion of population standardized for demographic composition, has been highly stable over both the long and short run.

An attempt will be made to explain this over-all stability, which contrasts sharply with other aspects of past labor force behavior — great decreases in full-time hours; disparate changes in labor force participa-

tion of individual population groups; inverse associations with incomes and earnings for different cities, groups, and even countries at the same moment of time; and dramatic responses in some lands to mobilization and demobilization of military forces. The manuscript will not be ready until fall; but *Occasional Paper 36*, 'The Labor Force in War and Transition: Four Countries,' will be published in April.

Clarence D. Long

#### GROWTH OF THE SERVICE INDUSTRIES

My survey of the long-term trends of employment in the various service industries should be completed in 1952.

One difficulty in dealing jointly with these industries is that they are extremely diverse. This diversity is illustrated, and the industrial scope of the monograph suggested, by the measures in the accompanying table. Consider first the form of business organization: the service industries, together with agriculture, are the area in which noncorporate enterprises are dominant; but general stores, among which department stores predominate, and wholesale trade, hotels, business services, motion picture theaters, insurance, and real estate are chiefly corporate (in terms of receipts) and usually have fairly large receipts per firm. The labor force per establishment generally parallels the receipts per firm.

The proprietors of unincorporated businesses constitute a sixth of the labor force in trade, almost a third in the personal services, and an even higher, but unknown, percentage in the professional services; but in the large-scale, chiefly corporate service industries they are commonly a much smaller fraction of the total. The service industries as a whole, and particularly the professions, education, and government, are the chief employers of college-trained men and women; yet certain of the service industries, such as domestic service, are, along with agriculture, the largest employers of workers without college education.

The 'coefficient of localization' is an index of the geographical concentration of workers in an industry relative to all nonfarm population. It is calculated by first taking the percentage of workers in a given industry that are in each state, then subtracting this percentage from the percentage of the nonfarm population in that state, and finally adding the positive (or the negative) percentages and dividing by 100. The minimum, which is zero, would indicate strict proportionality to the nonfarm population; the maximum is slightly less than 1. Only four of the industries listed in the table show as much geographical concentration as manufacturing: they are domestic service (with a heavy concentration in southern states); advertising agencies; real estate; and motion pic-

# ECONOMIC CHARACTERISTICS OF SELECTED INDUSTRIES

BUSINESS ORGANIZATION, 1945

L A B O R F O R C E

INDUSTRY	Percentage of enterprises incorporated	Percentage of receipts received by corporations	Average receipts per enterprise (thous. \$)	Employees per establishment (1948)	Entrepreneurs as percentage of labor force (1948)	Percentage of labor force that attended college (1940)	COEFFICIENT OF LOCALIZATION (1940)
Services							
Trade	7.3	48.9	82	5.7	16.6	12.6	
Wholesale	16.4	59.7	249	10.7	6.2	17.6	.111
Retail	5.2	40.0	53	5.0	19.7	11.7	.048
Food	1.6	33.4	51	3.1	32.3		.034
General	7.2	73.8	162	20.1	4.1		.060
Liquor	8.0	15.8	62	2.5	34.9		
Drug	8.2	30.6	62	6.2	15.0		.105
Apparel	11.6	50.7	79	6.1	14.0		.109
Furniture	12.0	43.9	52	5.4	17.3		.052
Eating and drinking	3.7	18.3	31	5.0	21.7		.097
Automobiles	15.4	32.5	85	8.3	10.9		.125
Gasoline	1.4	9.5	22	2.6	40.6		.173
Hardware	7.0	16.2	47	4.6	22.6		.117
Lumber	12.6	48.6	56	7.4	12.3		
Personal	3.2	38.5	14	3.4	30.0		.120
Hotels	5.1	53.9	24	8.1	11.7	9.0	.120
Laundries	8.8	47.6	32	13.1	8.0	6.4	.103
Beauty and barber			4	2.0	52.6		
Funeral			21	3.2	31.6		.065
Domestic service							
Business services	11.5	62.3	32	8.5	10.3	2.6	.185
Advertising	13.1	66.1	77	12.9	5.7	13.3	.111
Auto repairs	3.4	14.1	15	2.7	40.0		.082
Amusements	12.5	65.2	52	7.5	10.0	6.7	.139
Motion pictures	63.9	90.1	289	10.5	4.3	15.8	.219



tures. In general the service industries are where the urban population is, and some of the apparent concentration is due to the fact that in small communities, general stores handle commodities that in larger communities are sold by specialized stores.

Various bases of classification are being experimented with in order to reduce the analysis of employment to more manageable proportions. One promising basis is first a division between business and consumer service industries, and then the subdivision of the latter industries among the categories of consumer expenditure as these are conventionally classified in budget studies and national income accounts. A tentative allocation of the 1940 labor force in consumer service industries indicates that about 22 per cent of the persons employed therein were providing food, 17 per cent domestic service, and 12 per cent education; clothing, medical care, and automobile transportation each employed 9 per cent; and the remainder were in housing, personal care, furnishings, and amusements. This type of distribution of the labor force has an important use as a bridge between temporal changes in labor force composition and the wealth of budgetary data. Budgetary data, in turn, permit detailed analysis of the effects upon employment in service industries of variables such as income, urbanization, and family size.

George J. Stigler

#### TRENDS IN PRODUCTION AND PRODUCTIVITY

The economic development of the United States over the last fifty years, measured in terms of real gross national product, has been markedly discontinuous. Additions to aggregate real product, by decades, have been (in billions of dollars of 1929 purchasing power):<sup>1</sup>

<i>1891-1900</i>	<i>1901-10</i>	<i>1911-20</i>	<i>1921-30</i>	<i>1931-40</i>
<i>to</i>	<i>to</i>	<i>to</i>	<i>to</i>	<i>to</i>
<i>1901-10</i>	<i>1911-20</i>	<i>1921-30</i>	<i>1931-40</i>	<i>1941-50</i>
161	148	235	5	650

The greatest advances in output came in the first, third, and fifth decades, with a modest retardation in the second decade and a very great decline in the increment in the fourth decade.

The forces behind these discontinuities are many. The size of the increment in any period is affected by changes in the unit effectiveness

<sup>1</sup> Each of these sums is the amount by which total deflated gross national product over a ten-year period exceeded the corresponding total for the preceding ten years. The basic data are Kuznets' estimates of gross national product, modified to include war and defense expenditures of government. The series was extended to 1950 by means of Commerce Department estimates.

of labor<sup>2</sup> and in the absolute amount of labor input. Changes in labor productivity, ordinarily measured in terms of manhour output, are of central importance, for productivity thus measured is probably the chief factor determining the rate of economic progress and social reform. The general course of manhour output in the economy of the United States over the last fifty years, and in the major economic sectors was upward, but productivity advances have been marked by spurts and checks — occasionally by retrogressions. We have distinguished, provisionally, the periods of acceleration and retardation shown in the accompanying table.

The rates of change for the total economy may be compared with an average rate of growth in manhour productivity approximating 2 per cent a year between 1899 and 1950. It will be clear that quite different circumstances prevailed in the periods here distinguished. Any explanation of these spurts and checks must give heavy weight to the special conjunctures characteristic of each of these periods.

The disparate elements in the patterns of acceleration and retardation for the several major sectors of the national economy are perhaps more pronounced than the elements of agreement, but there are some interesting resemblances. The early or middle 1920's brought advances, not all synchronous, in the several industrial divisions represented; when the expansion of the twenties was spending its force there were retardations in productivity, beginning as early as 1926 in agriculture and railroading (and possibly earlier in sectors not represented separately in the table), and as late as 1931 in mining and manufacturing. Electric light and power, steam railroads, and agriculture were marked by the earliest productivity accelerations after the major recession that began in 1929. The same three divisions retained their forward impetus through the war years to 1943 or 1944, while retardation in manufacturing and mining came as early as 1940 and 1941. But before the war effort was over all industrial sectors suffered retardation. The postwar record is almost too brief to warrant general statements, but there is evidence of accelerated productivity in electric light and power, in mining, in manufacturing, and in agriculture, beginning in 1946 or 1947.

The study of productivity changes in the United States is a phase of a general investigation of changes in the volume and character of production during the last fifty years. The basic data, many of which have

<sup>2</sup> Setting production against labor input in the measurement of productivity involves, of course, no causal implication. Changes in output per manhour reflect the play of many factors, including number and efficiency of machines employed, administrative skill, organizational effectiveness, quality of labor employed, distribution of productive resources, etc.

AVERAGE ANNUAL RATES OF CHANGE IN OUTPUT PER MANHOUR

INDUSTRIAL DIVISION <sup>a</sup>	1919-50	Periods of acceleration		Periods of retardation	
		Dates	Rate	Dates	Rate
Total economy <sup>b</sup>	+2.0	1918-24 1932-41	+3.8 +3.3	1924-32	+0.9
Manufacturing	+2.4	1919-31 <sup>c</sup> 1932-40 <sup>c</sup> 1946-49	+4.7 +3.3 +3.5	1940-46	-0.7
Agriculture <sup>d</sup>	+2.0	1921-26 1934-44 1947-50	+3.5 +5.5 +3.0	1926-34 1944-47	-1.2 -0.5
Mining	+2.8	1919-31 1938-41 1946-50	+3.5 +4.4 +3.3	1931-38 1941-46	+2.5 +0.7
Steam railroads	+3.5	1932-36 1938-43 <sup>e</sup>	+5.7 +11.7	1926-32 1943-49	+0.6 -2.8
Electric light and power	+6.7	1924-27 1930-44 1946-50	+8.7 +9.4 +7.0	1920-24 1927-30 1944-46	-2.4 +0.8 -4.7

<sup>a</sup> Important economic sectors, notably the service industries, which enter into the total record are not included among the industrial divisions separately listed.

<sup>b</sup> At this time I give no figures on productivity changes for the economy at large for the decade of the forties. All general output and productivity measures for the war years are subject to a wide margin of error, because of the difficulty of accurate deflation of gross national product.

<sup>c</sup> In manufacturing industries there was very rapid acceleration (at an annual rate exceeding 10 per cent) from 1919 to 1922, but it seems best to treat this as part of the longer period of rapid growth extending to 1931. This twelve-year period was terminated by a brief but sharp decline from 1931 to 1932; thereafter the increase continued at a lower rate, but one which was still well above the average for the period 1919-50.

<sup>d</sup> Productivity in agriculture is measured by output per worker.

<sup>e</sup> In steam railroads the period of acceleration beginning in the early thirties merged into a phase of still sharper acceleration beginning in 1938, with no real retardation intervening.

been assembled in previous and current National Bureau studies of production and productivity, national product, labor force, and capital supply, are largely in hand. We are now engaged in the organization and interpretation of these materials. The plan of presentation includes chapters on the growth of production over the half century; on the role of labor input, capital equipment, and power as factors affecting the volume of output; on productivity, and on the allocation and distribution of economic gains. Current work has been concerned with patterns of productivity movements and with some of the major uses to which productivity increments have been put.

Frederick C. Mills

## OTHER STUDIES

Solomon Fabricant's book, *The Trend of Government Activity in the United States since 1900*, will soon go to press. Harold Barger's manuscript on employment and productivity in trade has been reviewed by the staff and is being revised. A new study of the distribution of wage and salary incomes by Thomas Atkinson is described briefly in Part Two. Daniel Creamer's investigation of personal income during business cycles is reported in Section 3 and Moses Abramovitz' study of governmental employment in Western Europe is reported in Section 6. The status of Gerhard Bry's study of German wages since 1871 and Ernest Rubin's study of immigration and the labor force is indicated at the close of Sections 3 and 6.

## 3 BUSINESS CYCLES

### PERSONAL INCOME

As background for the findings presented in last year's report we have developed a section on the long-term shifts in the relative importance of the major types of personal income over the period 1909-49. We selected years in which the cycles in personal income were at a peak, and in each peak year expressed each type of income — broadly identifiable with a particular socio-economic group — as a percentage of total personal income. Over these four decades nonfarm labor income rose from about half of total income to about two-thirds. About half of this relative gain was made during and immediately after World War I. While labor income registered substantial relative gains during and after World War II, these were no more substantial than the relative gains made in the emergence from the Great Depression. In the latter two periods the rise in transfer payments contributed significantly to the increasing share accruing to nonfarm labor. Our evidence suggests also that within the area of labor income the group below the highest paid executives made more rapid gains, particularly over the years since the Great Depression, than the latter group. On the other hand, property income and to a lesser extent farm income, and the net income of nonfarm proprietors declined relative to total personal income. The divergent movements in the shares of total income received as labor and as property income are largely attributable to divergent movements in rates of return rather than to divergent movements in the volume of factor input.

The topics covered in the manuscript under preparation are:

Long-term shifts in the personal income structure



Cycles in total personal income  
Cycles in major components of personal income  
Cycles in types of labor income  
Cycles in types of property income  
Cyclical variations in the distribution of income by size  
Government offsets to cyclical losses in personal income.

Daniel Creamer

#### CONSUMER EXPENDITURES AND SAVINGS PATTERNS

During the past year I attempted to complete the research on the study of consumer behavior from data contained in the Surveys of Consumer Finances at the Survey Research Center, University of Michigan. The main work before this year had been concerned with the analysis of a special sample of 655 urban spending units that were interviewed on two successive dates, in early 1948 and early 1949. The advantage of working with this sample is that it avoided memory errors in determining such variables as income change and beginning-of-year liquid assets. In recent months I devoted more time to the estimation of savings equations from larger samples, of approximately 2,500 spending units, in the nonfarm, nonbusiness sector. These were two independent samples interviewed in early 1950 and 1951. The estimated savings equations from the two samples are broadly similar to those obtained from the reinterview sample. Equations calculated for farmers and business owners show interesting differences compared with those obtained for the nonfarm, nonbusiness sector, but the former are much less reliable because of the smaller sample size and because of the relative complexity of the accounting problems of households that own a farm or a business.

Changes were made over previous work in the form of the equations used. The relation between savings and liquid assets was not assumed to be the same for all income classes, and the size of the spending unit was treated as a separate variable instead of as a deflator used to get per capita magnitudes. Both changes appear to improve the empirical savings equation. The negative relation between beginning-of-year liquid assets and savings falls in absolute value as income rises. Spending unit size is negatively related to savings.

A number of experimental calculations were made to test alternative ways of estimating the joint relation between savings, income, and liquid assets. The assumption of homoscedasticity when it is, in fact, not true leads to different estimates of the relation between liquid assets and savings than those that follow from the correct specification. The income-savings relation is not similarly affected by heteroscedasticity.

Another byproduct of the experimental calculations was a test of an alternative mathematical form of the income-savings relation. Instead of making the savings-income ratio a linear function of the logarithm of income, I made the savings-income ratio a linear function of income and its reciprocal. Both equation forms show the same general direction of curvature, but the logarithmic form shows a greater change in the marginal propensity to save between extreme income classes.

Equations relating durable goods expenditures to income, liquid assets, and age were studied for both the reinterview sample and a larger sample in the 1950 Survey of Consumer Finances. The two results are quite similar. A further calculation was made, exclusively for those in the reinterview sample who purchased some durables during the year. Some results appeared firmer for this group; and in addition the positive effect of liquid assets on expenditures was observed to fall from low to high income levels.

The residuals from the savings equation estimated from the data in the 1950 Survey of Consumer Finances were analyzed in relation to several attitudinal and demographic factors in much the same way as was previously done for the reinterview sample. With one exception, similar results were obtained. In the previous analysis it was found that the mean residuals were negative for those who had past income decreases and expected future increases (temporary decrease) and positive for those who had past income decreases and expected future decreases or no change (permanent decrease). The data from the 1950 Survey did not show any different mean residuals for temporary or permanent income decreases.

A number of calculations were made to check the main results. The effect of extreme observations was studied; alternative definitions of savings were used; parallel calculations with and without business owners were made; and departures from normality of the frequency distribution of residuals were analyzed. The conclusion drawn after detailed examination of these points is that the basic results, the preferred estimates of savings and durable goods expenditure equations, seem to rest on a firm empirical base.

Lawrence R. Klein

#### INVESTMENT IN INDUSTRIAL EQUIPMENT

During the year I began a study of the cyclical behavior of industrial equipment. This broad area of capital formation has not figured largely in the Bureau's cyclical studies to date, yet its investigation is desirable to complement work already completed or in progress on inventories, construction, and foreign investment. Our point of departure is a frag-

ment prepared by Wesley C. Mitchell over a decade ago, plus certain refinements of his ideas presented in Chapter 7 of his posthumous volume, *What Happens during Business Cycles: A Progress Report*. In these Mitchell establishes the comparative severity of cyclical swings in the output of industrial equipment, the even greater instability of orders and their tendency to lead the course of general business, the reduced leads and even substantial lags of equipment production, and finally the generally irregular timing and mild fluctuations of the stock of industrial equipment. It should prove worth while to check these findings against more recent and extensive bodies of data than Mitchell used, to note necessary amendments of detail, and to fill out the picture of equipment fluctuations in areas for which Mitchell lacked information.

With the main facts about equipment investment established, the next step will be to explore diversities in the over-all picture, to search for causes, and to relate this area of study to investment as a whole. To these ends I have reviewed the available evidence on the comparative behavior of equipment investment in public and private undertakings, in various major industry groups, and in several of the minor groups of manufacturing industry. In this exploration the distinction between industrial equipment and other types of fixed capital assets has proved difficult to maintain outside manufacturing industry, and it appears that the most promising route to an understanding of the cyclical behavior of equipment investment is to consider fixed capital investment as a whole. Part of what I have learned by proceeding along these lines is reported in a paper, 'The Cyclical Behavior of Investment,' presented to the Conference on Regularization of Business Investment in November. The findings of this paper strongly suggest the desirability of pushing beneath the industry aggregates to the level of the individual firm. Such studies are particularly needed for manufacturing industry, and could make effective use of the growing volume of data derived from the financial statements of individual companies.

Millard Hastay

#### COSTS AND PROFITS

I have been writing up in detail our findings, summarized in previous annual reports, about fluctuations in cost per unit of output during the cycle. I completed an introductory section, on manufacturing at large, and one on the steel industry. The introduction discusses, among other things, the relevant meaning of 'output' in multiple product enterprises, concluding that products should be weighted by prices received. Such an index is usually not available for a company or group of companies for which we have information about aggregate costs, and it becomes

necessary to ask whether something else will do. In the case of the steel industry we conducted some tests which indicate that fluctuations in cost per ton of 'finished steel shipped' ordinarily are similar in direction and roughly similar in amount to the fluctuations in cost per unit that could be computed if a comprehensive price-weighted measure of output were available.

The manuscript on cost should provide some background for later work on cyclical fluctuations of profit. We expanded our records of profits in several directions. With the aid of the financial manuals we extended the period covered by a special industry-by-industry tabulation prepared by Standard Statistics and Poor's. This gives us for the first time a reasonably continuous and industrially diversified sample of profits in the 1927-33 and 1933-38 cycles.

The profits of some companies begin to decline before a peak in business, and those of others continue to rise after a peak in business. Some companies have anticipatory rises before business troughs, and others persistent declines after them. We began to investigate the extent to which these differences in profit experience are reflected in differences in the movement of stock market prices. The first fact to impress itself upon us was that seasonal fluctuations in profits are not reflected in prices. Even when the profits of a company have a distinct seasonal pattern, the market value of its equity securities does not. It seems appropriate, therefore, to compare seasonally adjusted profits with prices that require and receive no seasonal adjustment. The next most obvious feature of the data is that during certain parts of the cycle there is very little correlation in direction of change between short-run, quarter-to-quarter changes in profits and those in stock prices. In the middle of a business expansion, to be sure, most profits are rising and most prices are rising; in the middle of a contraction, most profits and most prices are falling. But toward the beginning of a business phase and toward its end, when there is great diversity in the direction of movement of profits, the profits of a company often rise from one quarter to the next while the price of its stock falls, or vice versa. This is what we find if we compare prices in one quarter with profits in the next, on the theory that the market anticipates changes; or if we compare prices and profits in the same quarter, on the theory that the market is currently aware of developments in a company; or if we compare prices in one quarter with profits in the preceding quarter, on the theory that the market does not react until the quarterly earnings report is published.

When we look at longer periods, and when in addition we average the percentage changes in prices separately for companies with rising profits and for companies with falling profits, we do find differential

price movements of the kind that might be expected. But even then we do not always find rising prices for one group and falling prices for the other. In an expansion, for example, we are likely to find that the securities of companies with falling profits have risen in price, but by a lesser percentage than the securities of companies with growing profits.

These conclusions are tentative, as they are based on the experience of a limited number of companies in the rather short period 1920-26. Extending the inquiry to later years would bring in a much larger number of observations, but would increase the cost of the study per year covered.

I plan in 1952 to complete the manuscript on costs, to inquire somewhat further into the market's evaluation of differential changes in profit, and to write a general paper on cyclical changes in profit.

Thor Hultgren

#### MONEY AND BANKING

The past year's work can be conveniently summarized under four headings: (1) the construction of deposit and currency series; (2) the behavior of bank vault cash; (3) the distribution of the monetary holding of the public among currency, demand deposits, and time deposits; (4) monetary changes in wartime periods.

1) The monthly series on deposits and currency in public hands being constructed by Anna J. Schwartz were not completed, despite considerable progress, for two major reasons. (a) It was decided to revise extensively the series on currency in public circulation published in *Technical Paper 4* and to carry it back, probably to 1907, on a call-date basis. The critical step is the estimation of bank vault cash, and this series has an intra-weekly movement of roughly the same magnitude as its seasonal or cyclical movement. In consequence data must be either identically dated or adjusted for the intra-weekly movement to be comparable. The solution adopted in *Technical Paper 4* was to use only identically dated data. Further work on the problem has established the possibility of simultaneously estimating the intra-weekly and seasonal movements from call-date series on bank vault cash, by analysis-of-variance techniques. Our present plan is to use all available data on bank vault cash after adjusting them for the effect of both movements. (b) A recurring problem in work of this kind is the necessity of interpolating between values of one series on the basis of a related series. After puzzling over numerous special cases, I was finally led to examine the general problem systematically. This led to two rather unexpected conclusions: first, the techniques currently used both to select interpolating series and to carry

out the interpolation are seriously defective, so much so that they may in the majority of cases yield decidedly worse results than simple straight-line interpolation; second, an alternative technique suggested by simple statistical considerations is both free from these defects and not much more laborious to use. In light of these results, which at present are contained only in a rough draft of a manuscript on interpolation procedures, we are revising substantially the interpolation methods that have been used or contemplated for both the currency and the deposit series.

2) An examination of the behavior of bank vault cash, begun in connection with the preceding project, was continued primarily to judge alternative methods of estimating intra-year movements of currency in public circulation (i.e., outside Treasury and banks) for the period before 1914. Vault cash then included ultimate bank reserves as well as 'till' money, and so was even more important than after World War I. Allyn A. Young and others have used the call-date series on vault cash in national banks to interpolate between annual estimates of vault cash in non-national banks. The correlation between the short-period movements of vault cash in national and non-national banks is high for New York state; essentially zero for the rest of the country. In consequence, Young's call-date series on currency in public circulation is probably inferior to a series based on non-national bank vault cash figures obtained by linear interpolation between the annual figures, and certainly inferior to a series based on available data for New York banks and on straight-line interpolation for other non-national banks.

Like the intra-year movements, the cyclical movements of vault cash in national and non-national banks are by no means duplicates, though judgments of them are subject, as yet, to considerable uncertainty because based entirely on annual data. Non-national vault cash apparently tends to rise relative to national vault cash during expansions and to decline during contractions. Both the annual data, and some data for shorter time intervals, are consistent with the hypothesis that at least before 1914, and for banks outside New York state, vault cash in non-national banks behaved more like currency in public circulation than like vault cash in national banks.

The cyclical behavior of vault cash in national banks before 1914 is complex and needs further study: it can be treated either as inverted with a lag of about one-half a phase at trough and one-third to one-half a phase at peak, or as positive with a lead of about a year at both peak and trough; at troughs, the timing measures show greater consistency on an inverted basis; at peaks, on a positive basis.

3) An earlier report noted the major shifts that have taken place over the past sixty years in the relative importance of currency, demand

deposits, and time deposits. As a first step in interpreting these shifts, we have been examining the differential (positive or negative) cost of holding money in different forms. The initial results are encouraging. Data are readily available for the past two to three decades, and for this period there is a high correlation between the average rate of return on deposits (both time and demand) and the fraction of the money stock held in the form of deposits; and also between the excess of the return on time deposits over the return on demand deposits, and the fraction of all deposits held as time deposits. Furthermore, the former relation has a decidedly lower elasticity than the latter, a plausible result. Work is being continued, directed toward pushing back in time the figures on average rates of return, taking into account the risk of bank failure, and examining the effect of other critical variables. These analyses are of interest in their own right; they also have an important bearing on the general question of the form of the liquidity preference functions about which there has been so much dispute in recent years.

4) A paper presented at the Boston meetings of the American Economic and Economic History associations summarized the results of a detailed investigation into monetary changes during the Civil War and the two World Wars. The main object of the investigation is to explain the behavior of the general level of commodity prices in the three wars. This investigation, not yet complete, involved the construction of entirely new figures for the Civil War period on both currency and deposits. A byproduct may be the possibility of using similar methods to improve the figures for several decades beyond the Civil War.

Milton Friedman

#### FOREIGN TRADE

Current United States and United Kingdom statistics on trade quantity, i.e., trade at constant prices, were extended back to 1879 for the United States and to 1815 for Britain, with the help of several existing series. This provided the necessary data for the study of secular and cyclical fluctuations in trade quantity and for comparison of the latter with cycles in trade value.

Our data indicate retardation in the growth of foreign trade of both countries. In the United States the decline in the growth rate is comparatively mild and dates back only to the 1930's. In Britain there was a sharp break at the beginning of World War I, although the upward trend had weakened gradually since the end of the nineteenth century. These findings are consonant with rough estimates of world trade quantity which indicate that world trade tripled in the three decades before

World War I but rose by a mere 30 per cent during the next four decades.

The cyclical fluctuations of foreign trade were greatly affected by the retardation in its growth. This appears clearly when patterns of cycles in United States and United Kingdom export and import value and quantity for the period before World War I are contrasted with those for the interwar period. For instance, in business cycle expansions prior to the first World War, import value and quantity in the United States and Britain rose on the average 15 to 22 per cent; in contractions no series showed a greater average fall than 6 per cent. Thus the unfavorable effects of American and British import cycles were mild.

The picture for the interwar period is very different. Now import value fell more in business cycle contractions than it rose in expansions, on the average. The change was due to the enormously deeper plunge of import value in the major interwar contractions, not to its poor growth in expansions. In the United Kingdom, expansion amplitudes were the same, on the average, as they had been before World War I; in the United States they were even larger.

This more adverse effect of United States and United Kingdom import cycles on foreign countries, and particularly the sharp fall in American import value in the major interwar depressions, gave rise to the well-known complaints about American imports. It must be noted, however, that even in this period the upward pull exerted by imports in expansions was almost as strong as the downward pull in contractions. Moreover, import quantity fell much less than import value and, even in this period, grew more in expansions than it shrank in contractions.

In many respects exports behaved like imports. For example, American export value and quantity often continued to grow during business contractions before World War I, but usually declined during those of the interwar period, and in the United Kingdom mild declines in export value and quantity turned into sharp ones. In both countries the anti-cyclical influence previously exerted by exports disappears in the interwar period.

Ilse Mintz

#### WAR CYCLES

My general topic is a comparative study of business cycles in war and peace. The first task was to decide which cycles are peace cycles and which are war cycles. It is easy to decide on the expansion phase of the war cycle: it is that expansion during which armed conflict occurs. (For some purposes it will be necessary to define the expansion as beginning with the start of the war.) Next, the contraction must be dated. Here



one is immediately faced with a problem: Should the reconversion period be thought of as a cyclical contraction, or should it be considered a mere interruption of a continuing expansion? I have chosen to regard the reconversion downswing as part of the war cycle. Although the downswing may be short and mild, and although in many economic activities an actual contraction may not occur, the reconversion period is worth studying as an interval in which very sharp shifts in the composition of expenditure, output, and employment take place without (historically) giving rise to cumulative deflation.

Are all cycles which are not war cycles as defined above to be considered peace cycles — that is, cycles free from the influence of war? It would seem that the events which make up the cycle that immediately follows a war are to a considerable extent affected by developments during the war. For this reason I decided to treat the immediate postwar cycles separately from other peacetime cycles. Thus the war cycles and the postwar cycles will be compared with the peace cycles.

Obviously a study of this type could be a very long-range and complex investigation. It has been narrowed, at least initially, to a study of production and construction. Since comprehensive production and construction data are not available for the Civil War period, attention is confined to World Wars I and II.

While the data are being processed I have begun an investigation of capacity utilization in selected industries. These are industries in which continuous annual capacity and output data are available. At the present time the sample includes bituminous coal, byproduct and beehive coke, pig iron, steel ingots, electrolytic copper refining, petroleum refining, cement, and cotton spinning. Certain tentative findings may be briefly stated:

- 1) Variations in capacity in peacetime are largely independent of cycles in production. They are dominated by secular growth or decline.

- 2) Capacity utilization tends to vary directly with output. Exceptions occur when a sharp secular growth or decline in capacity causes utilization to move inversely to output.

- 3) Since capacity is largely independent of cycles in production, and since the annual rate of change in capacity is usually minor relative to the cyclical change in production, the amplitudes of fluctuations in capacity utilization are usually approximately equal to those in output.

- 4) In all the industries studied except cement the utilization ratios were much higher at their World War II peaks than in any previously recorded peacetime year. (Cement capacity utilization declined in both wars after the United States entered the war. This fact probably reflects the diversion of productive resources away from construction and into

products of more immediate use in the war effort.) In the industries where data for World War I are available — that is, in all the industries except cotton spinning and petroleum refining — the peak World War II utilization ratios are higher than the peak World War I ratios. Electrolytic copper refining is the single exception to this generalization. Moreover, the peak ratios in World War I exceed any of the peacetime ratios prior to World War II except in byproduct coke and cement. It is apparent that under the pressure of war demand, capacity utilization can be extended substantially beyond the peak peacetime rates, although perhaps at considerable cost as marginal capacity is tapped.

5) The peak war rates did not all come at the same time, but most of them came early. Coke, iron, steel, copper, and cement all reached peak utilization ratios in 1916, bituminous coal in 1918. During World War II the peak years were as follows: copper, 1941; coke, iron, and cement, 1942; cotton goods, steel, 1943; bituminous coal, petroleum refining, 1944.

6) In several of the industries, namely coke, pig iron, steel ingots, cotton spinning, and petroleum refining, the peak utilization ratios following World War II were higher than the previous peacetime peak rates. In coke, pig iron, and steel ingots these recent peacetime peak rates also exceeded the World War I rates, though not the World War II rates.

7) The extent to which unutilized capacity exists at business cycle troughs, and the magnitude of the increase in production made possible by more intensive utilization, has been minimized unduly in some applications of the acceleration principle to short-run cyclical changes in the output of specific firms or industries. The utilization rates reached even at the peak of most peacetime cycles are considerably below the record peacetime rates, and far below the rates achieved during World War II.

Bert G. Hickman

#### ANALYSIS OF TIME SERIES

The business cycle computing unit analyzed some fifty time series. Among them were the revised quarterly index of orders of railroad equipment, constructed by Millard Hastay, 1870 to 1942; three quarterly series, compiled by Henry C. Levy, on deposits, drafts, and excess of deposits over drafts, in New York savings banks, 1880 to date; and five monthly series, compiled by John Firestone, on customs receipts, 1871 to date; income tax receipts, 1910 to date; miscellaneous internal revenue, 1879 to date; total federal receipts, 1879 to date; and total federal expenditures, 1879 to date.

An investigation of methods of analyzing call-date series has been

carried out, and its implications for quarterly and annual series are being studied. The problem of correcting call-date series for seasonal variations has also been investigated.

The list of standard reference dates for the United States has been extended by Geoffrey Moore, with the collaboration of other members of the research staff, to cover the years 1938-50. The dates are as follows:

	MONTHLY	QUARTERLY	CALENDAR YEAR	FISCAL YEAR (ending June 30)
Trough	June 1938*	II 1938	1938	1939
Peak	Feb. 1945	I 1945	1944	1945
Trough	Oct. 1945	IV 1945	1946	1946
Peak	Nov. 1948	IV 1948	1948	1948
Trough	Oct. 1949	IV 1949	1949	1950

\* Revised from May 1938. The following revisions have also been made: trough in July instead of September 1921, and trough in November instead of December 1927.

Harry Eisenpress

#### OTHER STUDIES

Several manuscripts are in process of revision: Gerhard Bry's 'German Wages under Varying Business Conditions, 1871-1945'; Robert Ferber's 'A Study of Aggregate Consumption Functions'; Thor Hultgren's study of transportation and business cycles in Great Britain; Lawrence Klein's 'Railroad Services in the United States: A Cross-Section Study, 1928 and 1936'; Ruth P. Mack's 'Consumption and Business Cycles — A Case Study: The Shoe-Leather-Hide Industry'; Geoffrey H. Moore's 'Harvest Cycles'; and Oskar Morgenstern's 'International Financial Transactions and Business Cycles.'

Circumstances forced the postponement in June of John Firestone's study of the cyclical behavior of federal tax receipts, described in last year's report; he hopes to resume work on it in 1952.

A volume of essays dealing with Wesley Mitchell's life and work has been edited by Arthur F. Burns. This volume, entitled *Wesley C. Mitchell: The Economic Scientist*, is now in press. James Maxwell's *Federal Grants and the Business Cycle* is in press and W. Braddock Hickman's *Occasional Paper*, 'Trends and Cycles in Corporate Bond Financing,' is being reviewed by the Directors. The proceedings of the Conference on Regularization of Business Investment, held in November, are being prepared for publication under the editorship of Professor Melvin de Chazeau of Cornell University (see Part Two). For an account of the conference on short-term forecasting held at the University of Michigan in September, see Section 1.

## 4 BANKING AND FINANCE

### FEDERAL LENDING, LOAN INSURANCE, AND LOAN GUARANTEES

It was decided to concentrate a major part of our efforts during the first year of this project on the compilation of quantitative measures of the extent of federal lending, loan insuring, and loan guaranteeing. This work has now been virtually completed, though the assembling of reliable and exhaustive data governing all the agencies that have been active in this field has been a very substantial one. The main results will be presented during the coming year in an *Occasional Paper*.

Arrangements were completed late last summer with the Reconstruction Finance Corporation under which we shall obtain information on a sample of about 3,000 loans selected from the roughly 20,000 which were made by the RFC directly to business enterprises. Dockets for all of these loans are being examined for information descriptive of the concerns receiving financial aid and of the outcome of the loan transactions. A special unit is engaged in transcribing the information at the RFC offices in Washington, and it is hoped that the materials will soon be ready for analysis.

Concurrently with these activities, Neil H. Jacoby of the University of California at Los Angeles, who is responsible for that part of the study dealing with government credit extensions to business, has completed preliminary studies of the RFC's general lending program, of the industrial loan program of the Federal Reserve banks, and of the business loan guaranty program of the Veterans Administration. One of the principal findings of the latter study was that this program brought commercial banks, for the first time, into the business of making term loans to very small and new business enterprises. This effect was brought about in large part by a guarantee of up to 50 per cent of a loan by a bank to a veteran to enable the veteran to establish himself in business. It was found that the quantitative impact of Veterans Administration business loans upon the total national supply of credit to small business has been negligible, and that the default and loss experience on these loans has been relatively unfavorable. Nevertheless, the program has provided stimulus and incentive to bankers in using the techniques of making amortized term loans to very small enterprises — a consequence of not inconsiderable importance.

Harold Halcrow of the University of Connecticut, assisted by George Brinegar of the same institution, is responsible for the agricultural credit aspects of the study. He has been reviewing and summarizing analyses of the farm credit market served by government credit agencies, and of

the experience of these agencies as lenders. My share of the study, which has to do with the role of government in the financing of home ownership, has dealt mainly with the impact of government activities in this field on the economy generally.

During the coming year our work will consist principally of bringing to a conclusion these exploratory and fact-finding investigations and making as much progress as time will permit in the preparation of a report giving an integrated account of government financing activities in the three major fields, business, agriculture, and homeowning.

R. J. Saulnier

#### URBAN REAL ESTATE FINANCE

Two volumes issuing from our Urban Real Estate Finance Project were published during 1951 and one in March 1952: Ernest M. Fisher's *Urban Real Estate Markets: Characteristics and Financing*, C. Lowell Harriss' *History and Policies of the Home Owners' Loan Corporation*, and Carl F. Behrens' *Commercial Bank Activities in Urban Mortgage Financing*.

The manuscript by Edward E. Edwards of Indiana University on urban real estate financing by savings and loan associations was reviewed by the staff and its revision virtually completed. Two studies remain in the list of those originally planned: Wolfgang Stolper's analysis of economic fluctuations and urban real estate finance, and J. E. Morton's 'Comparative Markets and Risk Experience of Mortgage Lenders,' the latter the capstone volume of the project as a whole. Stolper's study progressed during the last year; but much remains to be done, and the manuscript can probably not be looked for until next year. It is hoped that Morton's investigation, on which appreciable progress was made, will be completed during the current year; new materials from the recent Census of Housing and Survey of Residential Finance, which will be available in June 1952, should enable him to give it a broad framework.

R. J. Saulnier

#### AGRICULTURAL FINANCE

During the last year the basic study in the Agricultural Finance Project, the monograph on 'Mortgage Lending Experience in Agriculture' by Lawrence A. Jones, of the Bureau of Agricultural Economics, and David Durand, was read critically by the staff and extensively revised. This important work on the factors accounting for farm mortgage fore-

closures during the period between the two World Wars is now completed and will be submitted shortly to the Director of Research.

The second main study of the project, Donald C. Horton's 'The Pattern of Farm Financial Structure,' was reviewed by the staff and is being revised by Dr. Horton. This task is a considerable one, and a revised manuscript probably cannot be expected until the second half of 1952.

Howard Diesslin's monograph on agricultural equipment financing is now being edited and will shortly be submitted to the Director of Research. E. Fred Koller is engaged in a revision of his manuscript, 'Financing Farmers' Cooperatives,' which we also expect to be completed during the coming year. Compilation and analysis of materials for our study of agricultural credit institutions, on which I am collaborating with R. J. Saulnier, will continue over the coming year. The resulting volume will deal descriptively with the various agencies engaged in extending credit to the American farmer, addressing itself particularly to the factors which have produced changes in the institutional structure of farm finance. Naturally, the work is being related closely to the current project on federal lending, loan insurance, and loan guarantees.

F. F. Hill

#### CORPORATE BOND RESEARCH

A brief report entitled 'Trends and Cycles in Corporate Bond Financing' is being reviewed by the Directors. This paper summarizes the principal findings of a larger work, 'The Volume of Corporate Bond Financing since 1900,' which will shortly be submitted to the Directors.

The larger study, the first of a series of three planned by the National Bureau on the corporate bond market, presents and analyzes previously unavailable materials on bond offerings, extinguishments, and outstandings, classified by such major groupings as industry, type of issue, and method and purpose of offering. Subsequent monographs will provide detailed breakdowns of the characteristics of the securities included in these aggregates, and an analysis of their behavior over selected periods.

As work has progressed on the first study, activity has shifted to the second. Thus far, we have examined in detail the distribution, by size of issue, of bonds outstanding, and find the changes in relative inequality since 1900 to be negligible: that is, although the average size of issue has increased considerably, the proportion of the total volume of bonds outstanding accounted for by the larger issues has remained virtually unchanged. The size distribution of the total number of bonds outstanding in the market typically shows somewhat greater inequality than

the major industrial components of this total. For example, railroad, public utility, and industrial bonds considered separately show less size inequality than bonds of all industries combined.

W. Braddock Hickman

#### CORPORATE SECURITY VALUES

The possibilities for a study relating security prices to the costs of acquiring capital by corporations have been explored, and a pilot study of the factors affecting bank stock prices, covering seventeen New York City banks at the beginning of 1951, has been made. A multiple correlation, cross-section analysis of these banks leads to the following tentative conclusions: (1) the two main factors affecting bank stock prices appear to be book value and dividends per share, and of these book value seems the more important; (2) low-priced bank stocks seem to sell for a little more in relation to book value and dividends than high-priced bank stocks; (3) after book value and dividends are taken into account, small differences in earnings do not seem to affect bank stock prices; and (4) the ratio of deposits to capital does not seem to affect bank stock prices. Of course, further analysis may modify these conclusions or suggest new ones. Particular attention will be directed toward the ratio of deposits to capital, because an increase in the deposits of a bank may eventually raise this ratio to a point where the management regards new equity as necessary.

David Durand

#### INVESTMENT PRACTICES OF INDIVIDUALS

The survey of financial asset ownership by individuals has been completed and a manuscript is now being prepared. Conducted as a joint project by the University of Wisconsin and the National Bureau, the study is based upon a sample of 3,462 Wisconsin state income tax returns for 1949. The interest and dividend items appearing on these returns are used to estimate the value of certain categories of financial assets, and the amounts of these assets are compared with other characteristics of their owners, such as income, occupation, and size of city. In this manner information is obtained on some of the factors that appear to determine the distribution of selected categories of wealth.

The major emphasis of the study is upon discovering groups in the population who are important as holders of corporate stocks. While the group with lowest incomes (under \$5,000) furnishes the largest number of stockholders, stockholding measured in value terms is concentrated in the middle and upper income ranges. Moreover, the character of the

stocks owned changes over the income scale: the holdings of the upper income groups include heavy proportions of stocks of closely held corporations. Similar concentrations are apparent in the ownership of stocks by occupational groups. Forty-five per cent of the total was held by individuals in the nonfarm managerial and self-employed group, a sector which constitutes only about 8 per cent of the labor force. In some occupations income level appears to be important in explaining ownership of stocks; in others, income seems less important. Businessmen in the low income group, for example, do not hold a greater proportion of corporate stocks relative to their total assets than do all individuals in that income group. Widows, on the other hand, are relatively heavy holders of corporate stocks in all income groups. The observed tendency for stock ownership to be concentrated in larger cities, as contrasted with small towns and rural areas, appears to be largely associated with income differences between communities.

Attention was paid also to the characteristics of the stocks owned and to the relation of the owner to the issuing corporation. While only 11 per cent of the value of traded stocks was owned by individuals or families receiving wages or salaries from the same corporation, approximately two-thirds of the value of untraded or closely held stocks was owned by individuals at least nominally active in the issuing corporation. Furthermore, there appears to be a significant tendency toward localization of equity investment: nearly 30 per cent of the value of traded stocks represented issues of corporations having major operations within the state.

Findings on the relation of income level to type of stock held are fairly in accord with current thinking on the subject. Preferred issues, utility stocks generally, and mutual fund issues are more important in the holdings of low than of higher income groups. The relation of income level to the agency-rating grade of stocks owned was examined in some detail. While the highest income groups hold smaller proportions of the prime risk stocks relative to their total holdings than do the lowest income groups, their holdings of poorer grade stocks are not relatively much greater than is the case with the lowest income groups. The net effect of the smaller proportionate holdings of prime risk stocks in the higher income groups is that the average risk of the stocks held is greater in the higher income groups. Nevertheless, since there appears to be a rather marked tendency for many individuals in the lowest income group who own only one issue of stock to choose a relatively risky issue, the ability of the upper income groups to achieve greater diversification results in an actually lesser proportion of individuals with risky over-all portfolio positions for the high than for the low income groups.



Additional areas covered by the study include attempts to determine whether the average yield of stocks held by low and high income groups differs systematically, whether the lowest income groups tend to prefer stock that sells at a low price per share over issues that sell at a high price per share, and whether there is a great difference in market activity between the various income groups.

Thomas R. Atkinson

#### OTHER STUDIES

Sergei Dobrovolsky's *Corporate Income Retention, 1915-43* was published during the year, and Avram Kisselgoff's 'Factors Affecting the Demand for Consumer Instalment Sales Credit,' *Technical Paper 7*, was published in January 1952. Wilson Payne completed a revision of his manuscript on fund flow analysis.

The volume presenting the proceedings of the Conference on Research in Business Finance, held in June 1950 at Haverford College under the auspices of the Universities-National Bureau Committee for Economic Research, is in press.

For other studies of banking and investment see especially Section 1; also Hastay's and Friedman's reports in Section 3 and Miss Hartland's report in Section 6.

## 5 FISCAL RESEARCH

#### THE INDIVIDUAL INCOME TAX

As a part of our study of the federal individual income tax, we are analyzing the varying importance to the tax revenues over time of the different components of personal incomes, and the varying impact of the tax upon them. Our first step has been to divide the income reported by individuals and fiduciaries submitting taxable income tax returns into two broad categories: (1) wages and salaries, and (2) property income. The latter is defined for the present purpose as comprising all kinds of income other than wages and salaries; i.e., dividends, interest, rents, entrepreneurial income from unincorporated business enterprises, fiduciary income, capital gains and losses, etc.<sup>1</sup> Some broad aspects of

<sup>1</sup> So far as the data in the annual volumes of *Statistics of Income* permit, the income we divide is adjusted gross income, which is the sum of the positive components of income minus the negative ones reported on taxable individual and fiduciary returns. It differs from net income in that it is not reduced by the personal deductions allowed

the relative behavior of these two categories as components of taxable income during the period 1918-48 are indicated below.

From 1918 through 1940, most of the revenue from the federal income tax on individuals may be said to have been obtained from property income. That is, if we apply to both the property and non-property income reported on taxable returns the average tax rate paid by each income group on its statutory adjusted gross income, we find that the proportion of the total individual income tax liability attributable to property income was more than 65 per cent in all but one of the twenty-three years, ranging from a high of 88 per cent in 1929 to a low of 58 per cent in 1932. Conversely, except in 1932, wages and salaries supplied only 12 to 35 per cent of the annual income tax revenues in this period.<sup>2</sup>

The principal explanation is that until the 1940's, the high personal exemptions excluded the bulk of wage and salary income from the income tax, while the low tax rates on the first brackets of taxable income caused much of the remainder to be taxed at relatively low rates. These influences had a smaller effect upon property income in the aggregate because income from property was more highly concentrated.

Until 1932, one-half or more of all taxable income each year was property income (on our definition) except in 1920 and 1921, when the proportions were 45 and 46 per cent, respectively. Between 1925 and 1929 the proportion of total taxable income that consisted of property income was close to two-thirds, although property income during these years constituted little more than one-third of the total income receipts of individuals.<sup>3</sup>

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by the statutes, such as for contributions, medical expenses, taxes, interest, and casualty losses. For some of the years prior to 1930, it was not possible to deduct all the negative components of income from the positive ones because the data are not available. The amounts of the two different classes of income components refer to the statutory definition. Thus property income includes only the taxable amounts of capital gains recognized by the statutes, rather than the total amounts actually realized, and excludes tax-exempt interest. We recognize that entrepreneurial income is a varying compound of property income and compensation for personal services. For the present purpose, however, we have chosen to treat it as property income.

<sup>2</sup> We use tax liability and tax revenues as synonyms herein; strictly speaking our revenue figures represent tax liability for the year or years cited, not actual revenue collections in those years.

<sup>3</sup> Figures for total income receipts of individuals and for total employee compensation are from Simon Kuznets' *Shares of Upper Income Groups in Income and Savings* (in press). The latter differ somewhat from total wages and salaries; and the former were adjusted by us as indicated in the next footnote.

In no year between 1929 and 1939 did the aggregate amount of wages and salaries reported on taxable returns amount to as much as one-quarter of total employee compensation;<sup>4</sup> and in the other years between 1918 and 1940, it ranged between 15 and 29 per cent. The amount of taxable income from property over the period 1918-40, on the other hand, ranged from 30 to 51 per cent of total income receipts from property by individuals.

Since 1940 a pronounced change has taken place in the relative importance of property and nonproperty incomes as sources of taxable income and of income tax revenues. From the high of 66 per cent of the income tax base in 1928, property income shrank to 43 per cent by 1939 and to 22 per cent of total taxable income by 1944; it was 24 per cent in 1948. Conversely, from a low of 34 per cent of the income tax base in 1928, the proportion of total taxable income supplied by wages and salaries rose to 57 per cent in 1939, and to 78 per cent in 1944, and was 76 per cent in 1948.

The proportion of individual income tax revenues attributable to wages and salaries, which had been only 12 per cent in 1929 and 31 per cent in 1939, rose to 64 per cent in 1944 and was 62 per cent in 1947, the latest year available. Correspondingly, the tax liability attributable to property income, which had been 88 per cent of the total in 1929 and 69 per cent in 1939, fell to 36 per cent by 1944 and was 38 per cent in 1947.

Among the principal factors responsible for these changes we note: (1) the greater growth of wage and salary income than of property income in recent years; (2) the reductions in personal exemptions, already alluded to, which had the effect of producing a greater enlargement of the taxable amounts of income from wages and salaries than of income from property; and (3) the substantial increase in tax rates on the lower brackets of income.

We are now examining the behavior of each of the principal components of property income. As is indicated in the report that follows, Daniel Holland is giving special attention to corporate dividends. Another aspect of the subject, personal exemptions, is reported on by James Maxwell, below.

Lawrence H. Seltzer

<sup>4</sup> Figures for total income receipts from property are those of Kuznets, *op. cit.*, adjusted to include the excess of realized capital gains over losses, the latter figures being drawn from my book, *The Nature and Tax Treatment of Capital Gains and Losses* (1951).

#### DIVIDENDS UNDER THE INDIVIDUAL INCOME TAX

In this study, designed to form part of the larger quantitative study of the personal income tax described by Lawrence Seltzer, the following are some of the matters to be investigated:

- 1) The degree to which net corporate dividend payments have been reached by the personal income tax
- 2) The importance of dividends as a component of taxable income
- 3) The amount of tax liability and the degree of revenue flexibility attributable to dividend receipts
- 4) The distribution of dividends among taxpayers
- 5) The number of dividend receivers.

Fairly comparable data are available from 1918 through 1948, a period long enough to permit examination of both cyclical and secular movements in these relationships.

Daniel M. Holland

#### PERSONAL EXEMPTIONS UNDER THE INDIVIDUAL INCOME TAX

During the summer I examined what has happened to the personal exemptions and credits for dependents during 1913-48. Their level has influenced significantly the number of people subject to tax and has also affected the tax liability of each individual. Furthermore, under present tax schedules exemptions and credits for dependents are responsible for all of the progression in effective tax rates in the first bracket of taxable income (up to \$2,000) and for most of it in the next two brackets (\$2,000-4,000 and \$4,000-6,000). Changes in exemptions and credits offer one of the principal means of adding to, or reducing, the tax burdens of persons with small incomes, and of adjusting such burdens according to family status.

James A. Maxwell

#### THE CORPORATE INCOME TAX

During the year I continued my statistical-historical study of the corporate income tax in the United States, completing a draft of two of the three sections of the proposed paper. The first section deals with general tendencies in corporate profits and taxes, 1909-45. Attention is given to cyclical and longer-term changes in the relative position of different size and industry classes in terms of the profits earned and the taxes paid to the federal government. A study of the effective tax rates and profit rates of small and large corporations has yielded some interesting patterns of behavior. The second section is devoted to a more detailed consideration of the 1931-39 period. Two episodes during that

period attract particular attention: the abolition of specific credit in 1932, which increased the tax load for small size companies by eliminating the exemption or credit that was given to corporations with net income of \$25,000 or less; and the imposition of the Undistributed Profit Tax in 1936-37, which increased the cost of internal corporate financing. The third section will deal with the 1940-45 period, when heavy excess profit taxation was in effect.

Sergei P. Dobrovolsky

#### FEDERAL EXPENDITURES FOR 150 YEARS

Work on this project was continued through the summer and, with the aid of Mark Wehle, during the fall months. The expenditures for the later years of the period examined, 1794-1950, have been expressed as far as possible on the basis of government payments to the public.

The chief task, however, has been to eliminate the civil components of the expenditures of the war and navy departments, and thereby obtain a more nearly accurate series both of military and of civil expenditures from 1844 to date. The figures for earlier years make such a separation exceedingly difficult and time-consuming. It is hoped that the basic data for more than a hundred years of federal expenditures will thus be improved not only for the further purposes of this study but also for those of any other study of federal expenditures.

A byproduct of the principal undertaking is a breakdown of military expenditures into their components. Analysis of these may afford certain inferences as to the impact on military expenditures of technological advances in the art of warfare.

M. Slade Kendrick

#### PUBLIC DEBT MANAGEMENT

It is a generally accepted proposition that the manner in which the national debt is managed is no less important in its effect on the economy than the size of the debt. Together with the size of the debt and the rate at which it increases or decreases, the interest rates, maturity distribution, ownership pattern, prices, and liquidity of government securities are significant variables. The purpose of this study is to examine these factors other than size, and to describe the nature of the Treasury operations associated with them.

The study consists of two parts. The first, upon which we are currently engaged, deals with the experience of the United States from 1860 to 1950. The second will deal with the public debt of Canada and Great Britain from 1910 to 1950.

Some of the most interesting findings, so far, relate to the comparison of debt experiences during the major wars involving the United States. In World War II the average interest rate on the total debt fell (from 2.5 per cent to 1.9 per cent); in World War I it rose (from 1.9 per cent to 3.6 per cent); and in the Civil War it fell and rose (from 5.6 per cent to 3.7 per cent to 5.2 per cent). Variation is found also in the maturity patterns, particularly with regard to floating debt, as is indicated in the accompanying table, which gives the maturity distribution for dates near the close of the wars.

**MATURITY DISTRIBUTION OF INTEREST-BEARING FEDERAL DEBT<sup>a</sup>**  
**JUNE 30, 1865, 1919, 1945**

TERM TO REDEMPTION OR MATURITY	P E R C E N T	O F	T O T A L
	1865	1919	1945
Demand <sup>b</sup>	4	4	24
Less than 1 year	7	14	24
1 year and less than 5 years	40	0	11
5 years and over	49	82	41
	<u>100</u>	<u>100</u>	<u>100</u>

A M O U N T I N M I L L I O N S

Total interest-bearing federal debt <sup>a</sup>	\$2,217	\$25,234	\$237,545
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<sup>a</sup> Excluding special issues held in Treasury trust accounts.

<sup>b</sup> Includes issues which possess a definite maturity date, e.g., savings bonds or notes, but which are payable upon demand of holder.

In examining the practices during World War II we note that few new techniques have been developed for influencing the government security market. Wide-scale advertising emphasizing patriotism, special low denomination securities to attract small investors, securities usable for tax payments, and the support of government security prices have been utilized in each of the three wars. The practice of 'tailoring securities to fit the needs of investors,' encouragement of the use of Treasury bills as a type of liquid reserve for banks, and employment of an appreciation security resembling Series E Savings Bonds all appear in the Civil War experience.

One of the most important questions we may hope to answer is the effect which different economic conditions tend to have on the debt management variables. Accordingly, in addition to continuing the analysis of wartime debt experiences in the United States, Canada, and Great Britain, future work will emphasize the analysis of debt operations in peacetime periods.

Marshall Robinson

## OTHER STUDIES

Lawrence Seltzer's *The Nature and Tax Treatment of Capital Gains and Losses* was published in June and James Maxwell's *Federal Grants and the Business Cycle* is in press. Daniel Holland's manuscript, 'The Taxation of Corporate Earnings Viewed as Personal Income, 1935-47,' has been read by a staff committee and is being revised. George Lent's 'The Exemption of Securities from Federal Income Tax and Its Effects on Investment' is being reviewed by the Committee on Fiscal Research.

Several other studies of governmental activity are in process. See Copeland's report on governmental requirements for capital in Section 1, Saulnier's report on federal lending and insuring in Section 4, and Abramovitz' report on governmental employment in foreign countries in Section 6. A manuscript by Waldo Fisher and Charles James, 'Governmental Price-Fixing in the Bituminous Coal Industry,' has been reviewed by the staff and is being revised.

## 6 FOREIGN ECONOMIC STUDIES

### GOVERNMENT ACTIVITY IN WESTERN EUROPE

Work was begun in October on a new study directed initially to the measurement of government employment in a number of European countries. This work is an extension of Solomon Fabricant's investigation of the same subject for this country (see the close of Sec. 2). The general objective of the studies is to obtain reliable information about the changing role of government in economic life. Our intention, therefore, is to proceed from studies of employment to more general measures of the use of resources, such as purchases and production of finished goods and services, and to indications of the influence of governments on the distribution of income. We shall also try, so far as possible, to throw light on the causes and the significance of the observable trends.

The work on government employment provides an opportunity to study the industrial distribution of manpower in general in European countries, since some of the sources of information will serve in both cases. Secular trends in the industrial composition of the labor force are basic to an understanding of the economic development of nations.

Work so far is in an exploratory stage and has centered on the United Kingdom. We hope that during the first half of 1952 it will be possible to make at least preliminary reports on three topics. One paper will be concerned with the numbers of workers employed by central and local governments in Great Britain from about 1900 to the present, distin-

guished so far as possible by function. A second report will deal with the industrial distribution of the British labor force since 1851. Confined to major industrial divisions, this report will be designed to furnish a general picture of the changing structure of employment during the last century. The third will be a study of the size and industrial composition of the Irish labor force during the same period. Comparison of employment trends in Great Britain and Ireland promises to provide a revealing contrast between a rapidly growing country and one that was declining or stagnant for much of the period. Study of the divergent experiences of these adjacent and politically connected countries should help us understand a little better the causes of economic progress and the impediments to it.

Preliminary estimates of public employment in Great Britain indicate that the number of government workers has risen seven- or eight-fold during the last half century while the working population increased by but 43 per cent. Whereas about 4 per cent of the British labor force found employment in the government services in 1900, about 24 per cent did so in 1950, nearly 14 per cent in the direct service of the central and local governments and another 10 per cent in the newly nationalized industries and services.

These figures bear comparison with Fabricant's estimates for the United States. At the turn of the century this country, like Great Britain, used about 4 per cent of its labor force in government service. Half a century later (1949), about 12 per cent were so employed, a figure only 2 percentage points smaller than Britain's if we take no account of the recent nationalization acts in British industry. Measured by the fraction of the labor force utilized, however, the expansion of British governments came relatively early. The British fraction became larger than the American in the years before the first World War. American government employment expanded more rapidly than British in the twenties, and still more rapidly in the thirties. The massive new fact, however, is the postwar nationalization of coal, transport, and public utilities in Great Britain, which has made the government sphere about twice as large in that country as it now is in ours.

Moses Abramovitz.

#### TRENDS IN FOREIGN TRADE

Owing to an unavoidable and long leave of absence taken by the chief assistant, little progress was made on this project during 1951. Operations are to be resumed early in the coming year and speeded up in the fall, when I expect to be given a leave of absence from my teaching duties at New York University.



That interesting questions demand attention has been indicated even by the small amount of work we were able to do. Thus, it is sometimes said that this country has been progressively insulating itself from the rest of the world and, in this and other ways, reducing its 'propensity' to import and contributing to the economic difficulties of other countries. This impression is largely derived from the declining trend in the ratio of United States imports to United States gross national product. Value of our imports did indeed rise less rapidly than our gross national product: the ratio of imports to national product, above 6 per cent in 1879, drifted down (with some irregularity) to only 3 per cent in 1949. Put in terms of physical volumes, however, the picture seems quite different. Change in quantity of imports kept pace approximately with change in the deflated gross national product or quantity of national production or consumption: no obvious trend, downward or upward, appears in the ratio of 'real' imports to 'real' product. If these figures are correct, they point to an important change in price relations. This warrants further attention if we are to understand trends in our foreign trade.

Solomon Fabricant

#### INTERNATIONAL CAPITAL MOVEMENTS AND CANADIAN ECONOMIC DEVELOPMENT

Annual estimates of the net capital inflow to Canada from foreign sources during 1868-1900 have been constructed both indirectly from the balance of payments and directly from a variety of sources. These, with the estimates by Jacob Viner for 1900-13 and similar estimates by F. A. Knox for 1913-26, form a complete series of balance of payments data from the year of confederation to the present.

Perhaps the most interesting aspects of the pre-1900 capital inflow are that it was accompanied by a net outward movement of labor, and in large part is to be explained in terms of government borrowing abroad, either directly or through guarantees of interest payments.

Penelope Hartland

#### INDUSTRIAL CONCENTRATION IN CANADA

A report on a study of concentration in Canadian manufacturing industries, begun under a Social Science Research Council Fellowship, is nearly completed. It describes the pattern of concentration in 1948 and changes in concentration over time. It also investigates the relationship of concentration to other variables that may account for changes and differences in the former. It does not deal with the effects of concentration.

The problems of definition and measurement of industrial concentration are dealt with rather fully, and the behavior of different indices of concentration is studied, as a basis for the selection of a set of measures in terms of which the investigation is carried out. A survey of theories explaining differences and changes in concentration provides a number of questions with which the statistics are confronted.

Concentration is defined, for this study, as the degree to which a large percentage of an industry (measured in terms of employment, income, assets, etc.) is accounted for by a small *number* of firms. Inequality is defined as the degree to which a small *percentage* of the firms account for a large percentage of the industry. Hence concentration is a function of inequality and of the number of firms.

The statistics of our sample for 1948 show that concentration of employment in Canadian manufacturing industries appears to be high when the frequency distribution of the number of industries by concentration is considered, but much lower when the distribution of employment is considered. For example, industries in which no more than six of the leading firms accounted for 80 per cent of employment in the industry constituted 43 per cent of all industries studied, but had only 26 per cent of the employment. This, of course, reflects the association between small industries and high concentration. A strong influence of industry size on concentration is also shown in another context. A comparison of concentration in the United States and Canada shows that with very few exceptions concentration in comparable industries is higher in Canada. This can be ascribed to the combination of similarity of average firm size and great difference in market size, resulting in a great difference in the number of firms.

Industries processing textiles, wood, and paper tend to have low concentration, while those processing metals, minerals, and chemicals tend to have high concentration. Food processing industries are intermediate and show many examples of both high and low concentration. Industries in which the cost or difficulty of transporting products or materials entails a regional separation of product or raw material markets have very low concentration (on a national basis) even though they contain many firms that overcome the resulting limitation on plant size by owning a chain of plants.

In studying the relationship between plant and firm concentration, we found that in most industries there is a tendency for larger firms to have *both* larger plants and more plants than the smaller firms. The difference between plant and firm concentration is illustrated by the fact that while 26 per cent of employment, in our sample, is in industries in which the six leading firms account for 80 per cent or more of

employment, only 14 per cent of employment is in industries in which concentration of employment in the six leading *plants* is equally high. The rankings of industries according to plant or firm concentration are highly correlated.

The survey of theories of concentration yielded the hypothesis that industries with large firms have high concentration ratios, and that size of firm is related to 'capital intensity,' or the ratio of capital to labor. We find a significant but weak positive correlation between average firm size and capital intensity; rank correlation coefficients ranging from  $+ .23$  to  $+ .74$  were obtained, depending on the statistics used to measure capital intensity, on whether the measure of firm size was more closely related to the numerator or denominator of this ratio, on the stage of the business cycle, etc. The rank correlation coefficient between capital intensity and concentration is only  $+ .36$ , and between size of firm and concentration,  $+ .62$ .

The size of firm and the size of industry influence concentration via the number of firms. The latter is highly correlated (inversely) with concentration, having a coefficient of  $- .94$ . The degree of inequality (in the sense defined above) evidently does not vary enough to be an important independent influence; its correlation with concentration does not differ significantly from zero.

The study of changes in concentration was confined to plant concentration, for lack of data on firms. For manufacturing as a whole, concentration increased from 1890 to 1922, remained about the same from 1922 to 1939, then rose sharply to 1943 and fell again, so that the level in 1946-48 was well below prewar. Study of ten individual industries, however, reveals no general increase in concentration within industries in the war period. This suggests that the wartime increase in concentration in manufacturing as a whole was due to the shift in output toward industries with large plants.

No systematic changes in concentration during the business cycle appeared on examination of the limited data available for the purpose. After completion of the present project, however, I hope to investigate further the differential impact of the business cycle on large and small firms, using American and other materials.

Gideon Rosenbluth

#### OTHER STUDIES

Ilse Mintz' *Deterioration in the Quality of Foreign Bonds Issued in the United States, 1920-1930* was published in April. Her report on foreign trade cycles is in Section 3. A study of the demand for American capital

from abroad is reported by Solomon Fabricant in Section 1. Ernest Rubin has prepared a draft of a *Technical Paper* on immigration and the labor force that will soon be submitted to the Director of Research. For other studies in the international field see Section 2 and the close of Section 3.

