PART III

Staff Reports

1. Business Cycles

STATISTICAL INDICATORS

The results of our continuing studies of statistical materials bearing on current and impending business conditions may be summarized as follows:

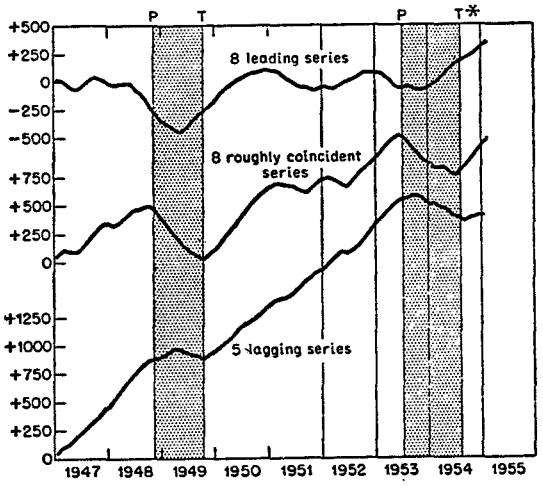
1. Recent behavior of the twenty-one statistical indicators selected in *Statistical Indicators of Cyclical Revivals and Recessions* (Occasional Paper 31, 1950) has tended to support the view that the prewar interrelationships among these series reflected certain basic economic "facts of life" which, while not necessarily impervious to change, might nevertheless prove to be lasting since they had already survived a great many years and a wide variety of economic changes.

A composite index that sums up the movements of the eight leading series reached a peak in February 1953; a second index based on the eight roughly coincident series reached a peak in June 1953; and a third index based on the five lagging series reached a peak in September (Chart 1). In November 1953 the index of leading series reached a trough, and it has since undergone a strong and steady revival. The index of coincident series reached its lowest point in July 1954 and that of lagging series, in September, both showing afterward a modest revival. These intervals and sequences are similar to those recorded by the same groups of series in the prewar period and in the 1948–1949 recession.

2. The considerable number of diffusion indexes that we have constructed from data on production, sales and shipments, employment, hours, profits, prices, and new orders conformed to the contraction in aggregate activity that began in mid-1953 in a manner consistent with their past performance. The diffusion indexes simply record the proportion of activities in a given economic sector that are expanding (or contracting) at any given time; hence they measure the scope of an expansion (or contraction) in the sector. In past business cycles the expansion phase has regularly become less widely diffused (i.e. more elements have begun

CHART 1

Business Indicators: Cumulated Net Per Cent Expanding, 1947–1955



* Tentative (August 1954).

Computed from directions of change in centered moving averages applied to each seasonally adjusted indicator. The net excess each month of the number of rising indicators (+) over the number falling (−), multiplied by 100 and divided by the total number in the group, is cumulated from month to month, beginning January 1947.

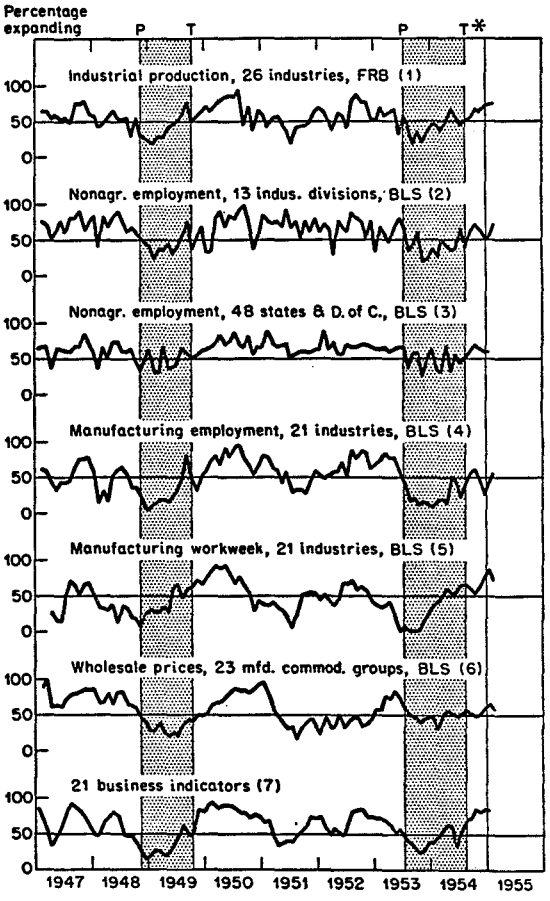
Shaded areas represent business cycle contractions; unshaded areas, expansions.

to contract) some months before aggregate activity reached a peak; similarly, the scope of the contraction phase has become narrower some months before the upturn in aggregate activity. The lead intervals have varied widely, but few have been shorter than six months and few longer than twelve. Most of the diffusion indexes in our collection reached peaks and began declining late in 1952 or early in 1953, indicating a decline in the scope of the expansion that culminated in mid-year; most began rising late in 1953 or early in 1954. Chart 2 illustrates how the contraction cumulated during 1953 as it encompassed a larger and larger fraction of the economic activities represented (i.e. fewer and fewer activities continued to expand); and how, around the turn of the year, the reverse process began. Some characteristic differences in timing also appear in the chart – for example, the early movements in the average workweek.

3. Diffusion indexes based on directions of change in component series over fairly long intervals (e.g. 12 months) appear to be of modest value in distinguishing severe from mild business contractions. Indexes based on short period changes (e.g. month-to-month) seem to be of less value for this purpose, because of their instability. Unfortunately, indexes of the former type ordinarily do not reflect cyclical turns so promptly as the latter. Consequently, their effective use appears to be limited to situations in which the character of the decline in business activity is still uncertain after some considerable period has elapsed. Possibly this limitation can be overcome by more powerful techniques. Since our results provide at least some support for the hypothesis that the scope of a business cycle contraction in its early stages has a significant bearing on its later development, we plan to push the inquiry farther.

CHART 2

Seven Diffusion Indexes, 1947–1955

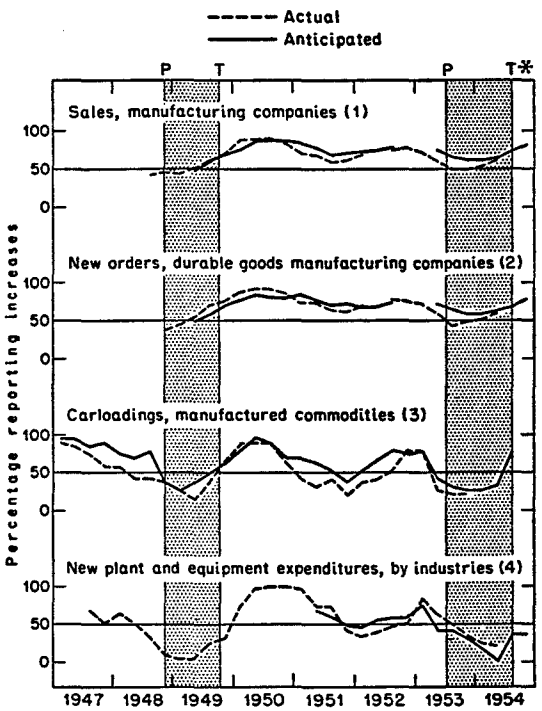


* Tentative (August 1954).

Shaded areas represent business cycle contractions; unshaded areas, expansions. Components of indexes are adjusted for seasonal variation except in (3), (5), and (6), where the components are unadjusted but the percentage expanding is adjusted. Indexes (1), (2), (3), (4), and (6) are based on directions of change in the component series from the preceding month; (5) and (7) are based on directions of change in moving averages applied to the component series.

4. Diffusion indexes based upon businessmen's plans or anticipations with respect to their own firms' activities are useful supplements to indexes based upon actual (past) activities, but must be carefully interpreted and compared with the latter (cf. Millard Hastay's report below). Optimistic or pessimistic biases may be present, and extrapolations of the recent past may affect anticipations in undue proportion. The behavior of four such diffusion indexes during 1947–1954 is shown in Chart 3.[1]

CHART 3
Diffusion Indexes Based on Anticipations Data, 1947–1954



* Tentative (August 1954).

Shaded areas represent business cycle contractions; unshaded areas, expansions.

Source: See text, note 1.

[1] The indexes (percentage reporting increases) are derived as follows: (1) and (2): *Survey of Business Men's Expectations,* Dun and Bradstreet. Half the companies reporting "no change" are counted as reporting increases. (3) *National Forecast of the Regional Shippers Advisory Boards,* Association of American Railroads. Based on changes shown for nineteen categories of manufactured goods (national totals). (4) *Plant and Equipment Survey,* Office of Business Economics (or Securities and Exchange Commission). Based on changes shown for 17–22 industries. Each index is based on comparisons of a given quarter with the same quarter of the preceding year, and is plotted in the middle of the interval between the two quarters compared, since it presumably represents developments *during* the interval rather than at its beginning or end or at the date of the survey. The most recent "anticipated" points plotted in Chart 3 are:

Index	*Date of Survey*	*Quarters Compared*	*Central Month (plotted)*
(1), (2)	Jan. 1955	II 54–II 55	Nov. 1954
(3)	Dec. 1954	I 54– I 55	Aug. 1954
(4)	Feb. 1954	II 54–II 55	Nov. 1954

Four papers describing these and other methods of analyzing the current business situation were prepared:

"Analyzing Business Cycles," *The American Statistician,* April–May 1954

"The Diffusion of Business Cycles," in *Economics and the Public Interest,* Robert A. Solo, editor, Rutgers University Press, 1955

"Economic Indicators and the Economic Outlook," *Michigan Business Review,* January 1955

"Business Cycles and the Labor Market," *Monthly Labor Review,* March 1955

Plans are being drafted for a volume that will set forth our results in systematic fashion.

GEOFFREY H. MOORE

ANALYSIS OF BUSINESSMEN'S EXPECTATIONS

I prepared a paper on "The Dun and Bradstreet Surveys of Businessmen's Expectations," which has been published in *Proceedings of the Business and Economic Statistics Section,* 114th Annual Meeting of the American Statistical Association, Montreal, Canada, September 10–13, 1954.

The paper is an attempt to validate the working hypothesis that expectations data make a net contribution to our ability to forecast the future of important economic variables. By a "net contribution" is meant that businessmen's expectations show substantial positive association with subsequent experience after allowance is made for the relation of the reported expectations to other data of potential forecasting value that are or become available at the same time as the expectations.

Such auxiliary data are supplied by the Dun and Bradstreet surveys themselves in the form of percentage distributions of the reporting firms according to the quality of their business experiences in the period just closed, and by the Department of Commerce in the form of aggregate time series which represent summations for past quarters of the economic variables to which the expectations of individual firms refer.

The findings of the paper, while not strictly conclusive, strongly suggest that in forming their expectations business executives take account of helpful information that is not wholly dependent on current or past values of the variables reported on. The expectations thus have forecasting value when used in combination with such pre-existing data.

As a test of these findings, the Dun and Bradstreet expectations data were used to appraise the timing and progress of the 1953–1954 recession on the basis of statistical relations worked out for the pre-recession period. The conclusion was reached on the basis of surveys through June 1954 (covering expected changes between the fourth quarter of 1953 and the fourth quarter of 1954) that a revival of activity was under way by the second quarter of 1954 and that the recession was a notably mild one. This conclusion has since been confirmed by the course of events.

MILLARD HASTAY

COSTS AND PROFITS

The work on costs and profits was concentrated on three specific subprojects.

Business Cycles and Corporate Earnings, 1919–1954

This is a study of year-to-year changes in cost ratios, margins, turnover, and rate of return, for all nonfinancial corporations and for the following major groups: manufacturing, trade, construction, railroads, electric and gas utilities, and the telephone industry. In this work we draw a distinction between operating costs and conventional costs. We call the ratio of the first to sales the operating-cost ratio, the ratio of the second to sales the conventional-cost ratio. Operating cost is mainly materials and compensation of employees. Conventional cost is determined by accounting conventions, legislative action, or the provisions of long-term contracts. Depreciation, property taxes, and interest on funded debt are the principal items. In general we find that even operating costs tend to fluctuate less than sales, although there are many exceptions. As one would expect, a similar tendency is more strongly present in the conventional costs. The slowness of aggregate changes in the latter is often responsible for a large part of the change in the ratio of total costs to sales, even though the conventional costs are a small part of the total except on railroads and in the public utilities. Thus from 1931 to 1932, for all nonfinancial corporations, the ratio of total costs to sales rose from 104.6 to 108.9 per cent, a rise of 4.3 percentage points, of which the operating ratio contributed 1.5 points and the conventional-cost ratio 2.8 points. At times the operating ratio has risen while the total-cost ratio has fallen.

A manuscript dealing with such matters has reached an advanced stage. Appended to it are condensed annual income accounts and derived ratios, for long periods of years. I plan to add a section on differences between manufacturers of durables and other manufacturers, as well as a section analyzing conventional costs more intensively in the industries in which they are most important. Perhaps this manuscript will be merged with a manuscript on cost per unit of output completed at an earlier stage of the project.

Profits and the Stock Market

Our data on profits and stock market values for numerous individual corporations, 1926–1938, were recorded on IBM cards, and some tabulations from the cards became available to add to prior figures beginning in 1920. They show, not surprisingly, that the percentage of companies having rising stock values tends to be highest at some time before the business peak and lowest at some time before the business trough. They also show that stock prices

and profits often move in opposite directions over short periods. At no time from 1920 to 1938 were the profits of more than 78 per cent of our companies moving in the same direction as the prices of their stock. During business expansions, a relatively high percentage of companies with falling profits nevertheless had rising prices. During contractions, a high percentage of those with rising profits had falling prices. These conclusions are based on simultaneous quarter-to-quarter changes in profits and values. Tabulations based on a one-quarter lead or lag have not yet been analyzed. Tabulations of comparative changes over longer fractions of business expansions or contractions have yet to be run. Manual tabulations of data for 1920–1926, previously made, indicate that differences in profit trends do show up in prices over periods somewhat longer than a quarter year. But the relation is still a very loose one.

The reason, of course, is that factors other than profits also influence the prices of stocks. One important factor is dividends, which in an individual company are often independent of profits over considerable periods. Even in the aggregate for all corporations, dividends are much more stable than earnings. That dividends are entitled to a good deal of independent weight is suggested by Table 1.

During 1955, I expect to carry our analyses of recent data a little farther, and to apply what can be learned from it to the interpretation of our main block of data running from 1920 to 1938.

Profit Leaders and Laggards

At the moment this is the least developed of the three subprojects. Its purpose is to determine on a year-to-year basis which individual industries had the more striking departures from the average profit experience. Attention should be concentrated on those industries which had assets of some importance (in manufacturing, say at least 1 per cent of total assets). Profit fluctuations in these industries would be interpreted in terms of data on output, sales, prices, wage rates, etc., many of which have been assembled. It is hoped that this project will help to identify the stimulating and the depressing factors at work in the various cycles from 1918 to date.

THOR HULTGREN

TABLE 1

DIVIDEND RATES, EARNINGS, AND PRICES OF COMMON STOCK, 67 LARGE CORPORATIONS, FIRST QUARTER OF 1954

Dividend Rate[a]	*Earnings Subgroup*	*No. of Companies*	*Average Earnings per Share*[b]	*Average Price per Share*
$0.00	Low	3	$—4.86	$12.62
0.00	Medium	3	1.36	9.59
0.00	High	3	3.23	13.60
1.00	Low	4	1.29	15.44
1.00	Medium	4	2.36	15.83
1.00	High	4	3.33	15.72
2.00	Low	10	2.87	35.54
2.00	Medium	10	3.76	29.94
2.00	High	10	5.55	37.39
3.00	Low	5	3.77	44.20
3.00	Medium	6	5.12	45.28
3.00	High	5	7.85	51.43

[a] Based on most recent twelve-month declarations.
[b] Calendar year 1953.

CONSUMPTION AND PRODUCTION OF CONSUMER GOODS

Consumption and Business Fluctuations: A Case Study of the Shoe, Leather, Hide Sequence is in press. I list its chapter headings:

RUTH P. MACK

MONEY AND BANKING

1. Anna Schwartz has completed her work on the series on components of the money stock, which have been described in previous reports. The major results are new series on currency in public circulation, adjusted demand deposits, time deposits in commercial banks, and time deposits in mutual savings banks for the period 1907–1954. These are monthly series, seasonally adjusted throughout; they cover all types of banks – national and nonnational, member and nonmember. There remain only such minor revisions as may be required by final adjustments in the new Federal Reserve Board annual series, 1896–1950, currently nearing completion. A monograph is in preparation which will present these new series, describe their construction, and analyze some of their implications.

2. David Fand has completed his estimates of the components of the money stock other than deposits in national banks for the period 1876–1896. These estimates are semiannual for a few of the earlier years, annual for the greater part of the period.

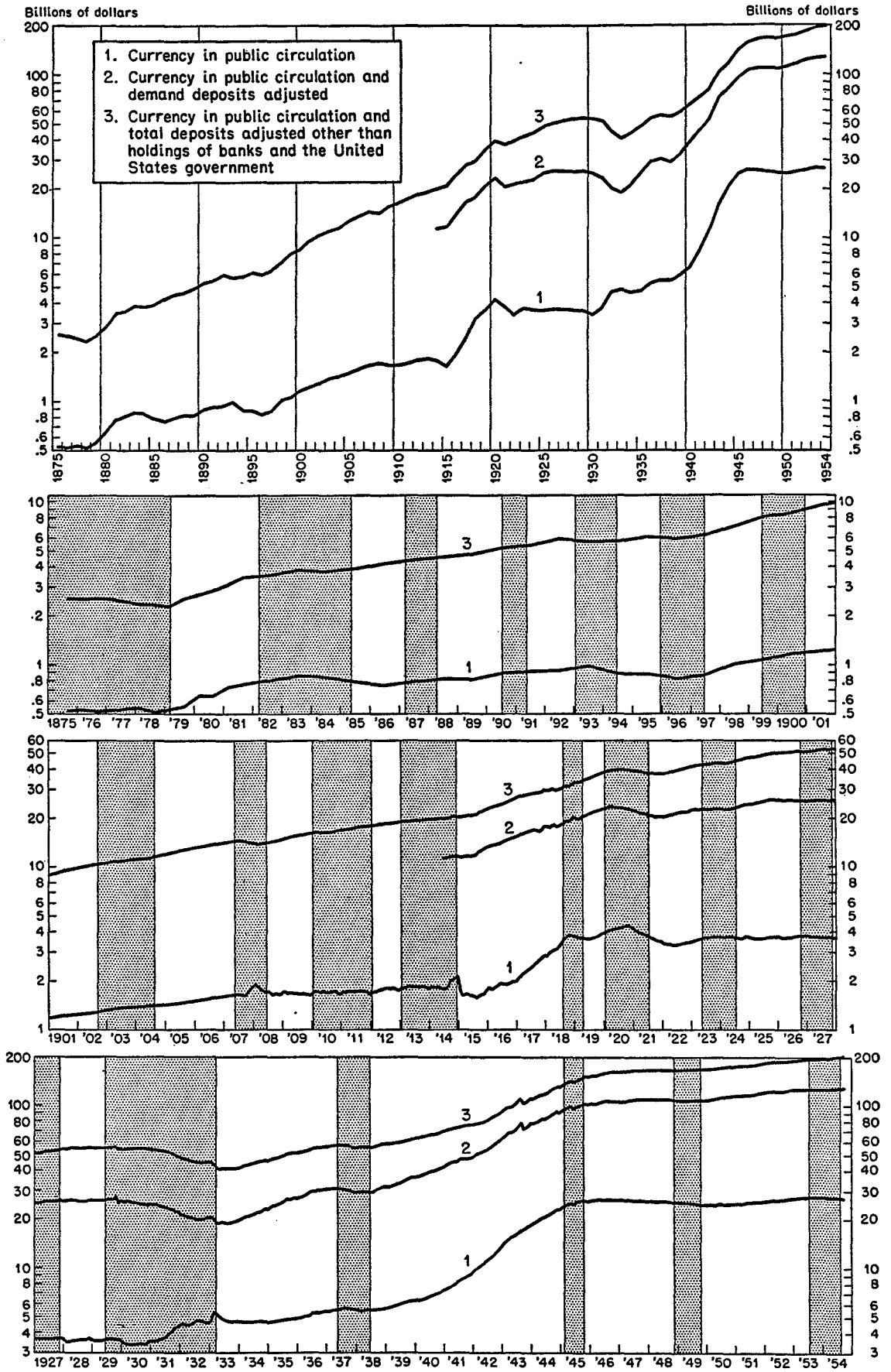
3. Phillip Cagan has been putting the various monetary series now available, including those described above, into shape for cyclical analysis. In the process, he is constructing a division of the money stock into the parts that can be regarded as publicly and privately created. He is also constructing a deflator for the money-supply series, so as to convert our series into estimates of real cash balances.

4. The Workshop in Money and Banking at the University of Chicago, an independent research enterprise which is cooperating with the National Bureau on these monetary studies, has undertaken a detailed examination of the relative adequacy of the quantity theory of money and the income-expenditure theory in predicting short-run movements in prices and income. Empirical work is under way for the United States, Canada, Great Britain, India, and Egypt, since geographic extension seems the most fruitful way of expanding the available evidence.

5. From the work described in points 1 and 2 above, continuous and comprehensive series on the stock of money in the United States are now available for a period of seventy-nine years – annually or semiannually for the first thirty-two years, monthly thereafter. This is the first time data on so comprehensive a basis have been available for so long a period for such fine time intervals. Some of these data are presented in Chart 4; in its deceptively mild undulations can be read much of the economic history of the United States.

CHART 4

Currency in Public Circulation and Publicly Held Deposits, 1875–1954



Shaded periods are contractions in business activity.

Ratio scales

As the top panel shows, total currency and deposits held by the public (i.e. excluding the holdings of money-issuing institutions, namely banks and the federal government) multiplied over eightyfold from the outset of the period to the present. During the same period, real output per capita apparently more than quadrupled and population tripled, so that total output multiplied over twelvefold; the stock of money per unit of output therefore rose to something over six times its initial level. A little less than half of this increase was absorbed by a rise in the size of cash balances relative to income – that is to say, by a halving of the income velocity of circulation of money; the rest produced – or was absorbed by – a tripling in prices.

In terms of annual rates, the money stock rose almost 6 per cent per year over the period as a whole, population about 1½ per cent per year, and output per capita about 2 per cent per year, so that the stock of money per unit of output rose at the rate of about 2½ per cent per year. One per cent per year of this rise was absorbed by a decline in velocity, leaving 1½ per cent per year to be associated with a corresponding rise in prices.

Of course, the increase in the money stock was far from steady. In the initial years of our period, 1875–1879, the money stock declined. This was the period when the United States was seeking to return to the gold standard after the greenback episode; a reduction in the money stock was part of this process, as may have been also the associated deep depression. On the resumption of the gold standard in 1879, the money stock shot up rapidly for two years, then leveled off, rising during the sixteen years from 1881 to 1897 at the average rate of 5 per cent per year. From then until World War I, the money stock rose at a decidedly higher rate, about 7 per cent per year, thanks to the exploitation of the South African gold discoveries and similar developments. This difference in the rate of growth of the money stock in the two periods, 5 per cent versus 7 per cent, was accompanied by a striking difference in the character of the periods: the first was a period of agrarian unrest, Populist movements, and silver agitation that culminated in Bryan's famous "cross of gold" speech; the second was a period of general political harmony, economic prosperity, and rising prices. In the intellectual climate of today and the recent past, with its derogation of the significance of monetary factors, it may seem preposterous to attribute this striking difference in the character of the periods to the difference in the rate of growth of the money stock; yet there is good reason to suppose that, if it was not the whole explanation, it was an important factor. Since 1914, well over two-thirds of the total increase in the money stock is accounted for by expansion during or immediately after the two world wars.

The lower panels of Chart 4 apply a magnifying glass to the data of the top panel in order to bring out more clearly the cyclical and short-time behavior of the money stock. These panels reveal strikingly the close connection of monetary phenomena with the business cycle. The stock of money rises during most of the contractions in general business – the periods which are shaded on these panels – as well as during every expansion. But, first, when it rises during a contraction it generally rises at a slower rate than during the preceding or following expansion; second, and perhaps even more important, every contraction during which it rises is a relatively mild contraction. The stock of money declined for more than an erratic month or so and by a significant amount on seven occasions: 1875–1879, 1892–1893, 1895–1896, 1907–1908, 1920–1921, 1929–1933, 1937–1938. Each of these declines occurred during a severe contraction in general business, and there is no contraction that can plausibly be labeled severe that is not in this list – unless it be 1882–1885. But 1882–1885 is on the borderline in monetary behavior: the estimated stock of money declined negligibly (by less than one-half of 1 per cent) from 1883 to 1884.

On some if not most of these occasions of monetary contraction, currency in public circulation (i.e. outside banks and the United States Treasury) rose during much or all of

the period when the total of currency and deposits declined. But though the behavior of currency is different, the cause is the same: indeed, the rise in currency in public circulation can be regarded as a factor producing or intensifying the decline in the total. These are periods of banking "panics," or loss of confidence in the banking system. The public wishes to convert deposits into currency; with a fractional reserve system, and a fixed amount available for reserves plus currency in public circulation, its success in this attempt forces a reduction in the total of currency plus deposits. This phenomenon was particularly striking in the 1907 panic; it was one of the main sources of the drive for monetary reform that culminated in the establishment of the Federal Reserve System. But, as the chart shows, the establishment of the system did not exorcise the causes of the phenomenon. Currency plus deposits fell from 1929 to 1933; currency alone rose from late 1930 to March 1933, with a particularly sharp spurt early in 1933. Under the Federal Reserve System, the process took a longer time than in most earlier periods, and the panic came at the very end of the contraction instead of near the beginning, as in 1907. This panic, too, produced monetary reform, the federal insurance of bank deposits.

The detailed behavior of the money stock from 1929 to 1938 is particularly interesting, since this is the period that is generally said to show the ineffectiveness of monetary policy. From October 1929 to September 1931, the monetary stock declined substantially: the total by almost 10 per cent, demand deposits, adjusted, by 20 per cent; in September 1931 England went off the gold standard and the Federal Reserve System engaged in sharp deflationary action to "protect" the gold standard. From September 1931 to March 1933 total currency and deposits fell by an additional 20 per cent, and demand deposits alone by 30 per cent, while currency in public circulation rose by over 25 per cent. An already severe contraction turned into a catastrophic depression. After 1933, the monetary stock rose, but only by enough barely to reach the 1929 level before it declined from 1937 to 1938, following hard upon rises in reserve requirements imposed by the Federal Reserve in early 1937. Income rose along with the monetary stock but without even reaching the 1929 level (in current prices) before it declined in the brief but sharp 1937–1938 contraction.

The post–World War II behavior of the money stock conforms closely to the earlier pattern. The stock of money rose during the immediate postwar expansion in economic activity, was roughly stable during the mild contraction of 1948 to 1949, and rose during the succeeding expansion. The rate of rise slowed down during the mild contraction from 1953 to 1954. Since early 1954, the money stock has been rising at a rather rapid rate in response to the easing of credit conditions by the monetary authorities. A general expansion in economic activity appears to have begun sometime in middle or late 1954 and to be proceeding vigorously.

These bits of history raise rather than settle important questions on money's role in business cycles. We are proceeding with our analysis of the facts, and of the theories offered for their explanation.

MILTON FRIEDMAN

REGIONAL AND INDUSTRIAL FLUCTUATIONS

I have been examining cyclical patterns in industries and regions in order to find whether there is a relation between the growth and decline of economic units and the size of the swing they undergo during a business cycle.

In general I expect to find wider cyclical swings in declining industries and in declining regions, for the following reasons.

1. Declining industries are characterized by excess plant capacity which can be returned to production during periods of high demand. Thus contractions and expansions of demand can be met more quickly than in a growing industry.

2. Declining regions are characterized by excess labor capacity – workers who have not

yet migrated to areas with growing per capita real income. A firm in a declining region will not quickly lose its labor force to alternative employments, should it shut down temporarily. Adjustments to expansions and contractions of demand can be met more easily than in a region where alternative employment opportunities exist and are growing.

Regional Variation

In measuring the cyclical variability of a region, two approaches are possible, depending upon the availability of data.

1. The first is to compare the cyclical experience of a given industry in different regions. In this way it is possible to view the variability of segments of the industry which are growing and declining as well as of segments which are located in growing and declining regions. This method is feasible for commodities such as coal, petroleum, lumber and forest products, iron and steel, machinery, cement, brick and clay products, agricultural implements, autos and trucks, fertilizers, paper and paper board, chemicals and explosives, and prepared food products. For these commodities, carloadings data are available quarterly by region since 1926, from the reports of the National Shippers Advisory Boards of the Association of American Railroads.

Interstate comparisons are also possible for industrial categories such as textiles, iron and steel products, and machinery, where monthly employment in the industry has been reported by agencies of different states. Starting in the 1920's, nineteen states reported to the Bureau of Labor Statistics on monthly employment by industry. These data formed the basis of the Bureau's indexes of factory employment. At present I am collecting data from these state sources in order to make individual industry comparisons.

2. The second approach is less time-consuming than the first and may be applied where the information is not as detailed; it also yields less information. It involves isolating the component, in the cyclical variability of manufacturing activity in a region, which is attributable to industrial composition. The remainder may then be ascribed to within-industry differences between this and other regions, differences which are presumably due to regional characteristics such as rate of growth or decline.

For example, in total factory employment for the United States the average movement per month (rise and fall) between the peaks and troughs of cycles during 1919–1938 was 1.10 per cent. The same measure for New York State factory employment was 0.98 per cent. A hypothetical employment series constructed by weighting in New York State proportions the fourteen industrial components of the national series yielded an average figure of 1.03 per cent. Hence, it appears that New York employment is less variable than national employment partly, but only partly, because comparatively stable industries are more important in New York than in the nation as a whole.

The economic significance of such calculations cannot be fully known until the computation has been performed for a large number of states. The reason is that until many areas can be compared, it is impossible to know whether unexplained differences between the region and the nation are indeed related to the rate of growth of the region.

Industrial Fluctuations

Cyclical patterns in industry can be analyzed without regard to regional differences. It is useful to compare growing and declining industries as well as the growth and decline phases of individual industries. Here the problem is more difficult: differences in cyclical behavior between industries can be attributed to differences in the income elasticity of demand; differences in cyclical behavior in a given industry can be attributed to changes over time in income elasticity as well as to changes in the severity of the general business cycle.

When making comparisons between industries, it is necessary to know that demand patterns are subject to substantially the same influences. For example, comparisons can be

made between the production of coal and rival petroleum products (mainly distillate and residual fuels), between beehive and by-product coke production, between rail and highway freight traffic, or between Bessemer and open-hearth steel production. When comparing the secular growth and decline phases of individual industries a measure of over-all cyclical fluctuations must be used as a benchmark. It will be of interest to make this analysis for industries whose trends have altered as much as those of the railway, coal mining, textile, leather products, and lumber products industries.

I am currently collecting and processing data on coal and petroleum.

GEORGE H. BORTS

TIME SERIES ANALYSIS

During the past year work has continued on improving our methods of constructing diffusion indexes. A memorandum was prepared, covering the following aspects of diffusion measurement: (1) current identification of cyclical expansions and contractions, (2) elimination of seasonal variations in diffusion indexes, (3) influence of variations in the number of component series included in the indexes, (4) the desirability of weighting the components. Current work is concerned particularly with the first two topics.

The problem of identifying the current cyclical phase of a series has been attacked by various methods. Of these, the most effective appears to be the device used for the twenty-one statistical indicators selected in Occasional Paper 31: that is, to smooth the series by a moving average whose period varies inversely with the average duration of run of the series (the average number of months the series moves in one direction), and then count all month-to-month rises (declines) in the smoothed series as cyclical expansions (contractions). An alternative method, based on the rank of the current month in the six-month interval ending with that month, does not improve on the moving-average method. Neither does a variant of the ranking method which uses only the information provided by the extreme ranks. These findings are surprising, since the ranking method, in principle, uses more information than the moving-average method. Perhaps the ranking interval used should be varied from series to series according to the smoothness of the data, as with the standard method.

The seasonal problem has become more important as the number of component series covered by our diffusion indexes has increased. It is impossible to adjust for seasonal changes the 2,000 component series of our important indexes by the usual time-consuming methods. Furthermore, postponing the adjustment to the final step of the computation, i.e. adjusting the percentage of series expanding based on unadjusted components, is altogether inadequate for such series as construction employment, where the seasonal factor is large and widely diffused, and in any event is not as satisfactory as prior adjustment.

We are therefore exploring the possibilities of making seasonal corrections on electronic IBM equipment. An experimental machine program is being prepared with the cooperation of the staff of the International Business Machines Corporation and will be ready for testing shortly. This program involves the fitting of moving polynomials to time series of ratios to the twelve-month moving average, for each month, subject to suitable conditions as regards the initial and terminal years of the series. We are also cooperating with the Bureau of the Census in analyzing the results of seasonal adjustments they have made by means of a machine program on their UNIVAC.

Another recent advance in seasonal calculation may be mentioned here. The seasonal correction of bank debits has been substantially improved by taking account of the varying numbers of Saturdays and Sundays in the months. This was accomplished not by reducing the data to a working-day basis, which was not satisfactory, but by deriving a regression for all the Januaries, all the Februaries, etc., during a period of years, between (1) the ratio of original data to the centered twelve-

month moving average and (2) the number of Saturdays and of Sundays in the month. The varying number of days in February, because of leap years, was handled similarly. (The effect of the moving date of Easter and of holidays that do not fall on the same day of the week every year can be treated by adding more variables to the regressions; these effects were negligible for bank debits.) It is hoped that this regression scheme can be added as a subprogram to the general machine program for seasonals, to be used for series that are affected by calendar shifts, where a working-day correction is unsatisfactory or difficult to apply.

HARRY EISENPRESS

OTHER STUDIES

Technical Paper 10, *Factors Influencing Consumption: An Experimental Analysis of Shoe Buying,* by Ruth P. Mack was published in September 1954. *Short-term Economic Forecasting,* Studies in Income and Wealth, Volume Seventeen, was published in March 1955; and *The Korean War and United States Economic Activity, 1950–1952,* by Bert G. Hickman, in April. *Personal Income during Business Cycles,* by Daniel Creamer is in press.

Two conference proceedings volumes are being prepared for press. One will include the papers presented at the October 1953 and May 1954 meetings of the conference on Policies to Combat Depression. The other will contain the papers offered at the September 1954 conference on Measurement and Behavior of Unemployment.

"International Financial Transactions and Business Cycles," a monograph by Oskar Morgenstern, is being edited. Geoffrey Moore's manuscript "Harvest Cycles," is being mimeographed. John Firestone is revising his manuscript on the cyclical behavior of federal receipts and expenditures for submission as an Occasional Paper.

Two studies have recently been initiated, one dealing with the occurrence and significance of cyclical movements (other than seasonal changes) of substantially shorter duration than business cycles, the other with the cyclical behavior of certain factors in the labor market. These are described briefly in Part Two. Other studies touching upon business cycle phenomena are described in Sections 4 and 6.

2. *National Income, Consumption, and Capital Formation*

CAPITAL FORMATION AND FINANCING IN THE UNITED STATES

This project, initiated in 1950 under a grant from the Life Insurance Association of America, includes a number of studies for which separate reports are being issued as well as a final summary volume. The reports published so far are:

The Role of Federal Credit Aids in Residential Construction, Occasional Paper 39, by Leo Grebler

The Volume of Residential Construction, 1889–1950, Technical Paper 9, by David M. Blank

Capital and Output Trends in Manufacturing Industries, 1880–1948, Occasional Paper 41, by Daniel Creamer

The Share of Financial Intermediaries in National Wealth and National Assets, 1900–1949, Occasional Paper 42, by Raymond W. Goldsmith

Trends and Cycles in Capital Formation by United States Railroads, 1870–1950, Occasional Paper 43, by Melville J. Ulmer

The Growth of Physical Capital in Agriculture, 1870–1950, Occasional Paper 44, by Alvin S. Tostlebe

Capital and Output Trends in Mining Industries, 1870–1948, Occasional Paper 45, by Israel Borenstein

The introductions to these Occasional Papers summarize the main findings and suggest their broader implications.

At the December 1954 meetings of the American Economic Association and the American Finance Association, papers summarizing some of the results of the studies of agriculture, of transportation and public utilities, and of financial trends in manufacturing and mining were presented by Alvin S. Tostlebe, Melville J. Ulmer, and Sergei P. Dobrovolsky, respectively. A manuscript on "Assets of Private Nonprofit Institutions in the United States, 1890–1948" was prepared by Robert Rude. It is expected that the results will be incorporated in the summary volume, now in preparation, covering the entire project.

The first monograph in the series, *Capital Formation in Residential Real Estate: Trends and Prospects,* by Leo Grebler, David M. Blank, and Louis Winnick, is now in press. Drafts of Morris A. Copeland's monograph on government capital formation and financing and of Melville J. Ulmer's monograph on transportation and public utilities are expected to be completed this year. Other monographs nearing completion are described below.

In connection with the summary volume, a separate volume of basic aggregative series has been planned. It will provide estimates of gross and net national product and their major components in current and constant prices, as annual series beginning with 1919, as overlapping decade averages for 1869–1878 through 1944–1953, and as five-year moving averages for 1869–1918. It will also contain population and labor force series, and estimates of national product per capita and per worker. Finally, it will include a reconciliation of the sector estimates of net durable capital formation with the national totals. We hope to complete this volume during the summer of 1955.

The findings that have already emerged clearly from the monographs suggest the organization of the summary volume around two groups of problems. The first relates to the levels and long-term trends in nationwide savings or capital formation in the distribution of such capital formation among the various capital-user groups, and in the distribution of financing among various types of sources and through various types of intermediaries. Each of the three complexes of problems in this first group is of fundamental importance to our understanding of both past trends and future prospects. Have the levels and long-term trends in capital formation proportions been governed largely by factors on the side of demand for capital investment (i.e. limited by inability to absorb greater volumes of available savings) or have they been governed by limitations on the supply of savings (i.e. limited by the pressures of consumption and other uses of products on current income)? If the limiting factors were significantly on the side of supply of savings, how was this limited supply distributed among the various industries so that some could acquire proportionately more capital than others? What are the main factors in the nationwide distribution among the major industrial sectors? Finally, what determines the choice between financing from internal sources and external sources and, within the latter, between direct financing and financing through intermediaries? The three groups of questions are clearly interrelated, and such interrelations – and their bearing on the long-run outlook for capital formation and financing – will have to be handled in the summary volume.

The second group of questions arises out of the finding that, in the past, the growth of both product and capital has been subject to long swings, alterations of rates that extended over periods of about twenty years. They have been appreciably longer than business cycles, yet superimposed, as it were, upon the longer-term trends. The summary volume must briefly present the characteristics of these long swings in the growth of population, total product, per capita product, and capital formation. Particularly important is the finding that these long swings are more prominent in some types of capital formation and in some sectors of national production than in others. With such significant differences in amplitude (e.g. wide in residential construction, capital purchases by railroads, and the net balance of international payments, and much narrower in durable capital formation in other sectors)

long swings in the relative importance of various sources of financing or even of various financial intermediaries should result. The second part of the summary volume will be devoted to an exploration of the implications of these long swings, since any analysis of past trends, the present position in the process of growth, and the prospects over any limited period in the immediate future requires a better knowledge of them.

The actual writing has been delayed to permit taking advantage of the full contribution of the several monographs. It is hoped that the writing will be completed early in 1956.

SIMON KUZNETS

Agriculture

Work centered largely on the preparation of a chapter in which earlier findings are summarized and reviewed with an eye to historical trends that provide clues to capital formation and financing in agriculture in the years ahead. These trends, observed in our data, suggest the following expectations:

1. Growth of capital in the aggregate will occur only in times of reasonable prosperity, at a rate that will average well below 1 per cent per annum.

2. Machinery, productive livestock, and cash balances will gain in importance in the capital mix; land and buildings and stored crops will decline.

3. Capital per farm and per person engaged in farming will rise, contributing to a rise in output per person engaged.

4. Volume of farm products per unit of capital will rise.

5. Funds for investment in agriculture will be provided chiefly by farmers out of their gross income, even though amounts and proportions provided by creditors remain above the 1945–1949 level.

6. Long-term mortgage credit will be used less for purposes of capital formation and more for transferring ownership of real estate than it was in earlier decades.

7. Non–real estate credit will represent a larger fraction of the total than in the first half of this century, partly because of the expanding need for production credit, partly because of the changing importance of the components of capital.

ALVIN S. TOSTLEBE

Manufacturing and Mining: Financial Trends

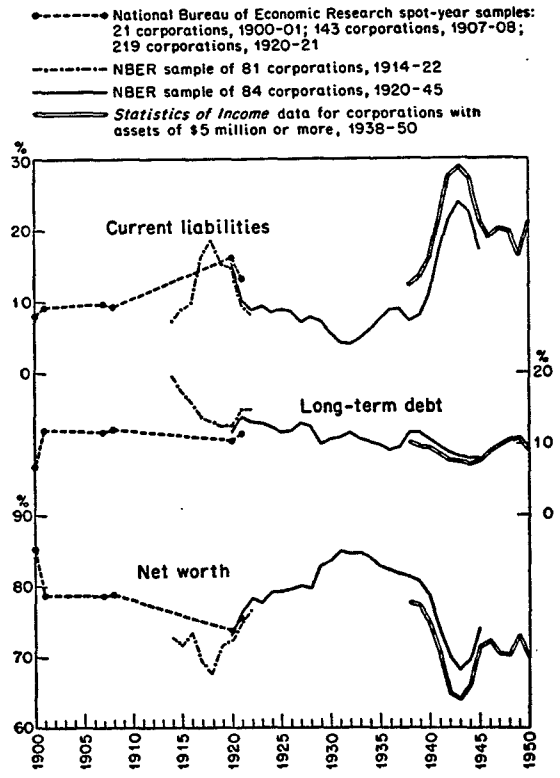
The materials available for this study consist of (1) balance sheet data which permit an examination of long-term trends in the financial structure and (2) data on corporate security issues and retained earnings, which can be used to analyze trends in corporate internal and external financing.

To supplement the corporate financial data previously compiled at the National Bureau, a new sample of twenty-one large manufacturing companies in 1900 and 1901 has been prepared. It includes virtually all manufacturing corporations for which balance sheet and income data are found in *Moody's Manuals* for the two years. With this new sample, we are in a position to examine changes in the financial structure of large manufacturing companies over the fifty-year period from 1900 to 1950. Similar data for small and medium-sized manufacturing companies are available for 1903 to 1950.

The trends in current liabilities, long-term debt, and net worth of large corporations are portrayed in Chart 5. The data on small and medium-sized companies reveal generally similar trends.

An upward trend is observed in the ratio of current liabilities to total assets over the 1900–1950 period. Until 1914 current liabilities in our sample of large firms represented approximately 10 per cent of the total. The ratio increased sharply (to almost 20 per cent) during World War I, then declined sharply and continued downward during the twenties and early thirties, going as low as 4 per cent in 1932. It began to increase again in the second half of the thirties, and shot up to a new high during World War II (29 per cent in 1943). In the postwar period the ratio dropped to around 20 per cent – a level twice as high as that observed in the years following World War I.

CHART 5
Ratios of Selected Liabilities to Total Assets, Large Manufacturing Corporations, 1900–1950



In contrast to current liabilities, long-term debt as a percentage of total capital was more stable. The ratio of long-term debt to total capital remained fairly close to 10 per cent during most of the period 1900–1950. It follows, of course, that changes in the ratio of net worth to total capital took an opposite direction from changes in the current liabilities ratio. Over the entire 1900–1950 period, net worth declined from over 80 per cent of the total to approximately 70 per cent.

The increases in current liabilities were largely accounted for by the rising burden of federal income taxation and the resulting expansion of tax accruals. The rise in accrued taxes was accompanied by an accumulation of liquid resources (cash and marketable securities) on the asset side. If tax accruals are excluded from total capital and an equal amount is subtracted from liquid assets, the balance sheet structure shows much less variation over the period reviewed. Computed on that basis, the ratio of net worth to total capital, was 80 per cent in 1950 – approximately the same as in the years preceding World War I.

Moreover, the relative importance of net worth and debt (including accrued tax liabilities) shows greater stability over the 1900–1950 period if the assets are valued at current replacement prices. On that basis, net worth amounted to 79 per cent of total assets in 1948, which is only slightly below the 1900–1901 level.

Finally, it should be mentioned that owing to a considerable drop in interest rates on the one hand and a sharp increase in profits before interest and taxes on the other, the relative importance of fixed charges in the corporate budget declined substantially after World War II. For all manufacturing corporations the ratio of interest paid to profit before interest and taxes was 12.3 per cent in 1929, 8.8 per cent in 1939, and only 2.6 per cent in 1950.

SERGEI P. DOBROVOLSKY

Financial Intermediaries

A revised draft of the monograph "Financial Intermediaries in the Process of Saving and Investment in the American Economy, 1900–1952" was completed and should shortly be ready for submission to the Directors.

The main addition to the revised draft was a concluding chapter which discusses the determinants of the relative size of financial intermediaries in the American economy, that is to say, of the share of financial intermediaries in national assets. Also, the statistical basis of the study was broadened to include finance and mortgage companies. On the other hand, some relatively specialized discussions which had formed part of the text of the first draft were shifted to appendixes, particularly a section dealing with the size distribution of firms in the various branches of financial intermediaries, and the very fragmentary material on gross flow of funds through financial intermediaries.

RAYMOND W. GOLDSMITH

GROWTH AND THE PATTERN OF CAPITAL FORMATION IN THE PETROLEUM AND STEEL INDUSTRIES

The objectives of this study are to examine the effects of several strategic factors on the volume and financing of capital formation, especially the effect of growth in output. The choice of the oil and steel industries for study for the period from 1920 to the present was governed by the availability of statistical information and by two other circumstances: Changes in the character of the product have been comparatively limited in these industries, and rates of growth in the two industries have differed substantially.

Balance sheet and sources and uses of funds data have been compiled for a sample of oil and steel companies for the period 1920–1953. The National Bureau's financial series were brought up to date and the number of companies in the samples was expanded from 8 to 17 for steel and from 13 to 24 for the oil industry, adjustments being made, as before, for revaluations.

These materials suggest that the long-run pattern of financing capital expenditures in both industries is quite unresponsive to changes in the costs of various classes of long-term funds. Thus, though the relative costs of debt and equity capital have undergone substantial changes in favor of the former since the early twenties, particularly when due allowance is made for the downward effect of increasing corporate tax rates on the cost of debt capital, the financial structure of oil companies in the aggregate shows very little change while that of steel companies is characterized by some decline in the relative importance of debt.

In the oil industry, despite a fivefold increase in total assets from 1920 to 1952, common stock and surplus remained approximately the same proportion of total long-term capital. Debt ratios rose from 1920 to 1927, a rise explained by the substitution of debt for preferred stock, but remained relatively stable thereafter. The major historical change in the sources of funds for capital expenditures in the industry has been the increasing importance of income retention at the expense of common stock issues. The former accounted for roughly one-third of net capital formation in the twenties, two-thirds in the thirties, and four-fifths in the post–World War II period.

Financial structures in the steel industry have been less stable than in petroleum. Debt ratios declined throughout the twenties, reaching a low point in 1930. Recourse to debt financing was taken in the thirties – a fact explained by the absence of savings in this period (the sum of dividend payments exceeded aggregate net income in the period 1931–1940). Debt ratios then turned downward, returning to the levels of the early thirties by 1945. The large volume of debt financing in 1951 and 1952 led again to a rise in debt ratios – a rise which, however, promises to be only temporary, since there was a large volume of net debt redemption in 1953. From the twenties to the post–World War II period, income retention increased at the expense of common stock issues as a source of funds, as in the oil industry. Internal sources of funds have also increased relatively to total sources, as a result of the increased importance of depreciation accruals.

Year-to-year variations in debt and equity as sources of funds for the two industries, in contrast to their long-run patterns, suggest some responsiveness to a broader range of variables. Both for oil and steel, debt ratios have usually been low at the peak in general business activity and high at the trough. On the other hand, debt ratios appear to be random with respect to peaks and troughs in capital expenditures in the two industries. This puzzling performance is probably the result of a complex set of factors including changes in the ratios of capital expenditures to current income available for retention, the types and amounts of securities recently issued taken in conjunction with long-run objectives regarding financial structures, and perhaps the pattern of security yields. These hypotheses are currently being checked on the basis of information recently developed, and more definitive results should shortly be available.

Plans for the future entail examination of

different groups of companies in the sample to determine the effect of differences in the rate of growth on the pattern of financing capital expenditures, and on trends and cyclical changes in capital-output ratios. We expect also to analyze variations in the relationship of capital to output in terms of differences in the composition of capital and of output, using both comparative data for different companies and historical data for each industry as a whole. An attempt is also being made to determine whether differences among companies in the relationship of capital and output can be explained by differences in earnings and in the costs of capital.

For the purposes of the study, measures of the stock of capital net of capital consumption are needed. Several ways of measuring capital consumption are being compared both as to quantitative differences in the results and as to conceptual significance. Preliminary estimates of capital consumption based on estimated retirements, on accrued depreciation, and on the amount needed to maintain productive capacity give substantially different results. Extension and refinement of the estimates is proceeding.

MICHAEL GORT

CONSUMPTION

A monograph tentatively entitled "A Theory of the Consumption Function" is in its final stages of completion. It deals with the allocation of income between consumption and saving, rather than with expenditure on particular commodities, though it has some implications for the analysis of data bearing on the latter problem.

The key feature of the hypothesis developed is its explicit distinction between the concepts of consumption and income that are implicit in the pure theory of consumer behavior – these are termed "permanent consumption" and "permanent income" – and the measured magnitudes called by the same names. The hypothesis asserts that the ratio of the permanent consumption of a consumer unit to its permanent income is the same at all levels of permanent income, the numerical value of the ratio depending on such variables as the rate of interest, the ratio of wealth to income, the degree of uncertainty attached to the receipt of income, and the type of consumer unit. The uniform tendency for measured consumption to be a lower fraction of measured income the higher the measured income results, on this hypothesis, from the effect of the transitory components of income plus classification of consumer units by measured income.

The interpretation of income data embodied in this hypothesis was developed by Simon Kuznets and me in *Income from Independent Professional Practice* (1945) for what at first glance seems a completely different purpose, namely the analysis of changes in relative income status. Extending this interpretation to consumption data turns out to yield a fruitful hypothesis apparently consistent with much observed data. The effect is to link two problems hitherto regarded as independent – the determinants of consumption expenditure and of changes in relative income status – and thereby to bring much of the wide range of statistical evidence accumulated about the distribution of income to bear directly on the interpretation of consumption behavior. Looked at in this new light, many of the apparent differences in consumption behavior that have been interpreted as reflecting differences in consumer tastes and preferences turn out to be – or can be regarded as being – disguised reflections of differences in certain characteristics of the distribution of income: that is, they can be predicted from knowledge of these characteristics without any knowledge about consumer habits or tastes.

The monograph first presents the theoretical rationalization for the hypothesis. It then examines the consistency of the hypothesis with three major kinds of data: (1) data from budget studies on the expenditures and receipts of individual consumer units for a single unit of time, (2) time series data on aggregate expenditures and income in each of a series of years, and (3) data on the income and consumption of individual consumer units for

more than one period of time. The hypothesis yields predictions about rather precise quantitative characteristics of the data, and the data in the main conform rather closely to these predictions. The evidence thus seems to justify provisional acceptance of the hypothesis.

If accepted, the hypothesis has important implications for the direction of further research in consumption and also for problems of policy.

MILTON FRIEDMAN

EXPLORATORY STUDY ON THE DISTRIBUTION OF INCOME BY SIZE

The purpose of this study was to identify the areas of research in which significant contributions could be made to an understanding of the dynamics of the distribution of income by size. The exploration involved, among other things: (1) examination of objectives and clarification of the purpose served by various types of income distributions; (2) examination of the nature, meaningfulness, and limitations of estimates of size distributions now available annually; and (3) survey of basic source data available for further analysis of determinants of income distribution by size.

A major conclusion is that the main effort should be channeled into study of factors making for change in the distribution of specific types of income and in particular wages and salaries, rather than into the measurement of changes in the degree of inequality in the over-all distribution. Considerable stress should be laid on combining analysis of income determinants with study of the structure of income and changes in the ways in which persons receive compensation for participation in economic activity.

A wealth of source material and a number of studies covering a wide range of problems and processes directly relevant to a study of income determinants have accumulated, especially since the war. Considerable insight into the complexities of size distributions of income among individuals and spending units can be obtained by systematically analyzing source data (published and unpublished) and by integrating the various pieces of established knowledge that have emerged from past research. Yet the analytical complexity of the problem, as well as the heterogeneity of source data, rule out a uniform plan of attack.

It is suggested that the unifying principle for further work in this area should not be an attempt to force source data into a uniform analytical mold, but to organize the inquiry around a number of significant hypotheses on the interrelationship of forces which account for the structure of income in the contemporary American economy.

In view of these considerations it seems desirable to concentrate research efforts on the distribution of labor income since 1939 (the first year in which income questions were included in the *Census of Population*), since cross-sectional data permitting analysis of variables related to the distribution of labor income are practically unavailable for earlier periods.

GEORGE GARVY

OTHER STUDIES

Regularization of Business Investment, a volume reporting the proceedings of a special conference, was published in March, 1954. *Long-Range Economic Projection,* Volume Sixteen of Studies in Income and Wealth, was published in September, 1954, and Volume Seventeen, *Short-Term Economic Forecasting* in February, 1955. *Input-Output Analysis: Technical Supplement* was multilithed for the Conference on Research in Income and Wealth, for limited circulation. Four conference proceedings volumes are in press or being prepared for press: *Input-Output Analysis: An Appraisal; Capital Formation: Concepts, Measurement, Controlling Factors; Capital Formation and Economic Growth;* and *Comparability of National Accounts.*

A new study of the postwar capital markets is described briefly in Part Two. See Part Two

also for a report on the activities of the Conference on Research in Income and Wealth and for an announcement of a special conference on Consumption and Economic Development, to be held in the autumn. Other studies dealing with income, consumption, and capital formation and financing are reported in Sections 1 and 4.

3. *Wages, Employment, and Productivity*

TRENDS IN WAGES AND PRODUCTIVITY IN THE UNITED STATES

Studies of wages, employment, and productivity have long occupied an important place in the National Bureau's work. Last year, with the assistance of a grant from the Alfred P. Sloan Foundation, we began a project that will trace the long-run trends in money and "real" wages, and in the relations between the volume of output and the quantities of labor and capital employed in production. Reports on the two parts of the project follow.

Wages

The study of the history of wage rates in the United States over the last hundred years got under way in the early months of 1954. For the period since 1914 the data on wage rates, employment, and payrolls have been collected and revised, and it should be possible shortly to begin preparation of the text. In this connection mention may be made of a sample survey of the wage costs of fringe benefits being conducted by the Bureau of Labor Statistics under a contract made with the National Bureau.

The period 1890–1914 is being explored under the direction of Albert Rees, with the assistance of Donald Jacobs and Robert Weintraub. Because of special difficulties in measuring both money and real wages in those years, the investigation has concentrated on the construction of new series of money wages and the cost of living. In the process, data published by labor and statistical bureaus of the states have been canvassed. Of the forty-eight states the following compiled usable data: Connecticut, Maine, Massachusetts, Missouri, New Jersey, Ohio, Pennsylvania, Rhode Island, West Virginia, and Wisconsin. In 1914 approximately 45 per cent of all wage earners employed in manufacturing industries in the United States were employed in those ten states.

The data from the states have been used to construct hourly earnings series by industry. Series have been constructed for cotton, hosiery and knit goods, silk, woolen and worsted, boots and shoes, iron and steel, leather, paper and pulp, and rubber. They were computed as follows: For each state, average annual wages in an industry were divided by weighted average annual days worked to determine average daily wages. The industry series for the ten states were combined, using census employment figures as weights. The resulting daily wage series were then adjusted to national levels and divided by daily hours (census-adjusted Bureau of Labor Statistics data) to obtain hourly earnings.

The industries covered include some for which no wage series were previously available; among them are several that were growing rapidly during the quarter century before 1914. Preliminary results suggest that these rapidly growing industries increased their wages faster than others, and that previously existing wages series covering all manufacturing during that period may be biased downward because of their concentration on mature industries.

A preliminary canvas of information on the cost of living compiled by the states indicates that the data are usable and will permit improvements over traditionally accepted cost-of-living indexes for the period in question.

The behavior of wages in still earlier years,

1860–1890, is being studied by Clarence D. Long, who began work on this project in the winter of 1954. He reports as follows:

The study undertakes to examine intensively the wage materials that are available in the report to the Aldrich Committee, covering the full thirty-year period; the Weeks report to the Tenth Census, covering the twenty years ending 1880; and the report of the Bureau of Labor covering the twenty years beginning 1870. These documents have the virtue of reporting wages as the rate or the price of labor, rather than as earnings; the Aldrich report makes it possible to compute the hourly wage, and both the Aldrich and the Weeks reports provide daily wage rates by identified establishment, by number, sex, and occupation of workers, and by state. The foregoing information covers variable periods, but there is also a great mass of annual or twice-yearly wage data covering the same establishment for the entire periods of the reports.

Several studies have been published using some of these materials. The sole systematic analysis, however, was Wesley Mitchell's *Gold, Prices, and Wages under the Greenback Standard* (University of California Press, 1908). This classic study was monumental in scope. Nevertheless, much remains to be done. Attention must be given to the decade 1881–1890, not covered by the Greenback period. Analysis is needed also of the behavior of wages in the West and South, as well as on an occupational and establishment level. The materials need to be re-analyzed from the point of view of measuring the price rather than the earnings of labor, and experiments should be made with methods of weighting the wages of various establishments and industries to determine whether our picture of the course of wages would be different had weight been given to establishments whose wage data began late in the period.

The entire plan of the study cannot be formulated until all the materials have been fully examined. Meanwhile, the intention is to work closely with data of individual establishments and occupations, so that comparisons from one year to the next will come as near as possible to revealing changes in wage rates for the same type of labor service, and will be affected to a minimum degree by changes in the type of person and type of work. The focus of the study will be on the following questions: What was the trend of wage rates during 1860–1890 in relation to living cost, to prices of the product of that labor (where there is a direct product), and to prices of the chief material used by that labor? How did wages behave in the major and minor economic contractions of the period? Additional attention will be given, time and resources permitting, to the following: Did the structure of wages behave differently for skilled and for unskilled labor (e.g. bricklayers and bricklayer helpers) in the same establishment? Did wage movements coincide more closely for different occupations within the same establishment, or for different establishments within the same occupation? Had the occupational and regional differences in wages become narrower in 1890 as a result of the much greater geographical mobility afforded by the network of railroads built after the Civil War? Can any impact on the level and structure of wages be detected from the tides of immigration that swept in during those years, or from the great differentials in economic growth that characterized different regions?

LEO WOLMAN

Productivity

We have completed estimates of the physical volumes of input and output since 1899 for the national economy and for most manufacturing industries. Work has been started on other industrial segments, and all estimates will be pushed as far back toward 1870 as possible.

The output and labor-input estimates for industrial sectors are largely those contained in previous National Bureau monographs, extended through more recent years. The industry capital-input series are based on the real net asset estimates appearing in several of the studies in capital formation and financ-

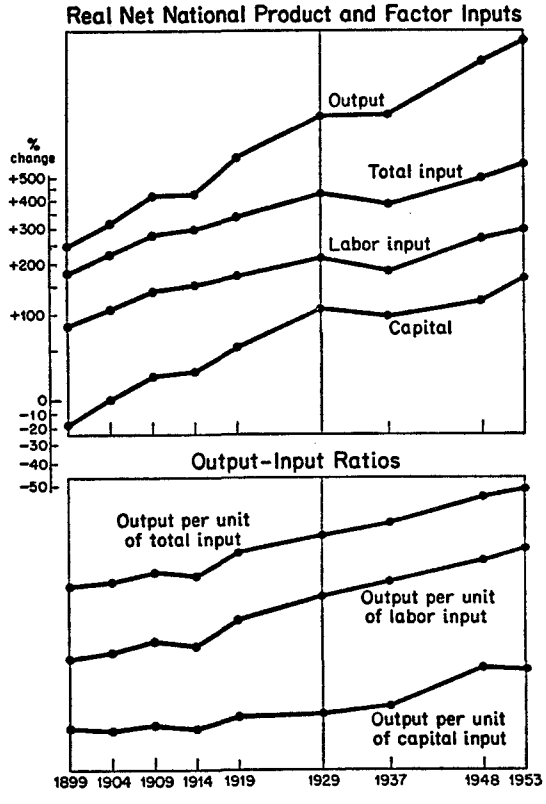
ing. For the economy as a whole, the real national product estimates developed by Simon Kuznets as well as those of the Department of Commerce have been utilized. The national capital estimates are based largely on those prepared by Raymond W. Goldsmith, which may be reconciled closely with the industry capital estimates. The employment and hours estimates contained in other National Bureau volumes have been supplemented from additional sources, and the national employment estimates reconciled with labor force data from the censuses of population, as refined by Clarence D. Long.

Preliminary results indicate that total productivity in the United States, that is, national output per unit of labor and capital combined, increased at an average annual rate of around 1½ per cent between 1899 and 1953. The numerator of the productivity ratio is based on the Kuznets' real net national product estimates, adjusted to include all national security purchases. The denominator of the ratio comprises man-hours worked and real net capital assets weighted by the incomes accruing to labor and capital respectively in the base period, 1929.

The productivity ratio thus conceived is a rough measure of change in productive efficiency. The ratio of output to any single factor input, say labor, would tend to rise as the efficiency of production increased, but its change would also be influenced by the rate of factor substitution – that is, by the degree to which labor input changed in relation to capital input. It is evident from Chart 6 that a significant degree of substitution of capital for labor, in addition to the general growth of efficiency, contributed to the saving of labor over the period.

The average annual rate of growth in total productivity was slightly greater between 1919 and 1953 than in earlier years. The capital output-input ratio rose very little in the early period while the labor output-input ratio rose almost as much as in later years. Between the years 1919 and 1953, output grew significantly in relationship both to capital and to labor.

CHART 6
Net National Output, Input, and Output-Input Ratios, Indexes of Physical Volume (1929 = 100), Selected Years, 1899–1953



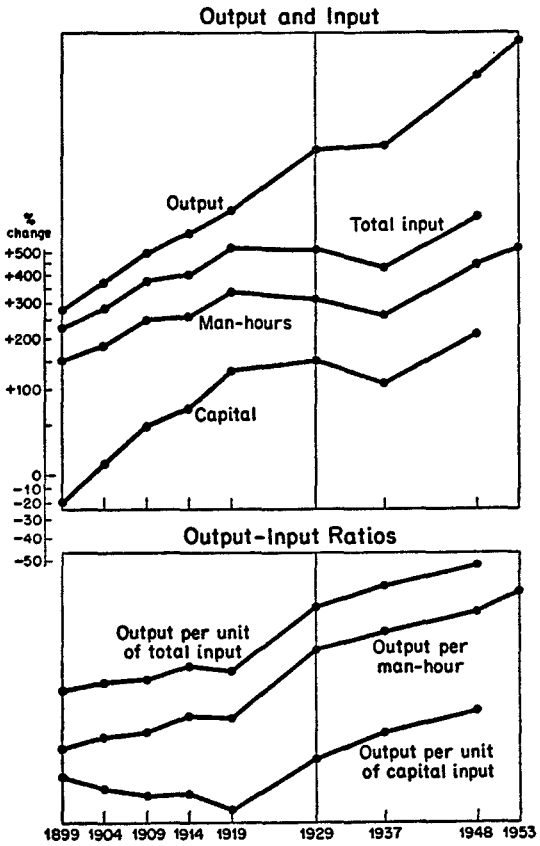
Since the turn of the century, productivity gains have largely accounted for the rise in planes of living. In addition, there has been some growth of factor input per capita, more because of accumulation of capital than of growth in labor input relative to population.

The rise in total productivity in manufacturing – averaging about 2 per cent a year over the period 1899–1948 – has been greater than in the economy as a whole. Output per man-hour in the manufacturing sector rose at an average annual rate of 2.3 per cent, reflecting about the same degree of substitution of capital for labor as in the economy as a whole. This substitution was greater in the earlier period, when output rose less rapidly than capital input, than in the period since World War I, when both capital and labor inputs declined relative to output (see Chart 7).

The productivity gain in the manufacturing sector as a whole is, of course, an average

CHART 7

Manufacturing Output, Input, and Output-Input Ratios, Indexes of Physical Volume (1929 = 100), Selected Years, 1899–1953



of widely divergent rates of growth in its component industries. In the case of fifteen manufacturing groups, for which capital as well as labor-input estimates have been made, the average annual increase in total productivity over the half-century 1899–1948 has ranged from 0.6 per cent in lumber products to 4.3 per cent in rubber products. These averages conceal considerable variation in productivity movements in successive time periods as well as divergent movements of the component industries within the groups. The full array of available time series for census years will be presented in the final monograph.

Output per man-hour generally shows a somewhat larger average annual percentage increase than does total factor productivity in the manufacturing groups, as is apparent in Table 2. The percentage increases in the two measures would be the same if real capital per man-hour had not changed between 1899 and 1948. Differences between the two rates of change are therefore a result of the greater rates of growth of capital than of labor inputs, shown in the input columns of the table.

The general correspondence between the patterns of secular rates of change in total productivity, and output per man-hour, is due

TABLE 2

AVERAGE ANNUAL PERCENTAGE CHANGE IN MANUFACTURING OUTPUT, INPUT, AND OUTPUT-INPUT RATIOS, 1899–1948

		Factor Inputs			*Output per Unit of*	
	Gross Output	*Total*	*Capital*	*Labor (man-hours)*	*Total Input*	*Labor Input*
Lumber products	0.2	–0.5	0.9	–0.6	0.6	0.8
Leather products	1.3	0.0	0.2	0.0	1.3	1.3
Furniture and fixtures	3.0	1.6	1.6	1.6	1.5	1.5
Food and kindred products	3.4	1.7	2.3	1.6	1.7	1.8
Textiles and apparel	2.9	1.0	1.6	0.9	1.9	2.0
Fabricated metal products	4.5	2.5	3.3	2.3	2.0	2.2
Primary metals	4.2	2.1	3.2	1.8	2.0	2.3
ALL MANUFACTURING	3.9	1.8	2.8	1.6	2.1	2.3
Petroleum refining	7.6	5.1	5.6	4.3	2.3	3.1
Paper and allied products	5.0	2.6	3.8	2.4	2.3	2.6
Stone, clay, and glass products	3.7	1.2	2.3	1.1	2.5	2.6
Chemicals and allied products	5.9	3.2	4.2	2.6	2.6	3.2
Printing and publishing	4.6	1.9	2.5	1.8	2.7	2.8
Transportation equipment	6.5	3.1	4.7	2.8	3.3	3.6
Tobacco products	3.7	0.2	3.2	–1.6	3.6	5.5
Rubber products	7.8	3.4	5.4	3.2	4.3	4.5

partly to similar rates of factor substitution and partly to the generally heavy relative weight of labor. In the leather and furniture groups, however, there was little or no increase of capital per unit of labor input. In tobacco manufactures, on the other hand, there has been a large degree of substitution of capital for labor, and capital is weighted more heavily relative to labor than in other groups. Output per man-hour in the tobacco industry therefore rose much more than total productivity over the period examined. In all groups, the short-period correspondence between the two measures is considerably less than for the half-century comparisons shown in the table, since changes in capital relative to labor input have proceeded unevenly within the period.

Exploratory efforts to estimate real *net* output in various manufacturing groups have been limited in scope, because of the time-consuming nature of this procedure and the lack of good basic data in some areas. In certain groups, however, relatively good price indexes by which to deflate the gross value of ouput and the value of materials and services purchased from other industries are available for the entire period. In the food group (excluding beverages), for example, deflated gross value of product between 1899 and 1947 rose by 420 per cent – almost exactly the same increase shown by the physical volume index. The deflated value of purchased materials rose by 380 per cent. As a consequence, real value added rose by more than 500 per cent and its ratio to the real value of gross output increased from 24 to 29 per cent. This reflects primarily a shift in composition of output toward more highly processed foods, and also some increase in processing and materials saving within individual industries. Productivity in the foods group shows a trend rate of increase of 2.2 per cent based on net output, which compares with 1.7 per cent based on gross output. If time permits, work along these lines will be undertaken in some other industry groups.

The estimates in the table indicate that productivity has generally increased most rapidly in those industries which have shown the largest gains in output – a relationship that had been demonstrated by Dr. Fabricant using the detailed estimates for manufacturing industries through 1939. It is also apparent that there has been a significant positive correlation between productivity gains and the growth of real capital stock in the various groups. While the degree of correlation between rates of increase in productivity and in man-hours employed is less close, it is clear that the industry groups that have experienced most rapid gains in productivity have not generally lagged in providing increased employment. Further investigation of interrelationships between productivity trends and trends in other economic variables will be made upon completion of the basic indexes for all the industries of the various sectors for which reasonably reliable data are available.

JOHN W. KENDRICK

TRENDS IN EMPLOYMENT IN THE SERVICE INDUSTRIES

The report under the above title is being reviewed by the Board. Its scope and content are indicated by the following chapter and section headings:

1 The Growth of the Service Industries
  - The Trend of the Service Industries
  - The Public Economy

2 A Historical Preface
  - Population
  - The Progress of Communication
  - Income

3 The Classification and Characteristics of Service Industries
  - Type of Buyer
  - Categories of Consumer Expenditures
  - Private vs. Public Activities
  - Type of Business Organization
  - Labor Characteristics

4 Retail Trade
  - The Growth of Trade
  - Kinds of Business and Forms of Organization
  - Factors in the Rising Employment in Trade

5 Routine Personal Services
  - Domestic Service
  - Barber and Beauty Shops

6 The Professional Service Industries
  Trends in Numbers
  Recruitment and Business Organization
  Professional Income
7 The Business Services
  Employment Trends in the Business Service Industries
  Wholesale Trade
8 Factors in the Trend of Employment in the Service Industries
  Technology
  Specialization
  Income
  Population Characteristics
  The Supply of Labor

GEORGE J. STIGLER

DEMAND FOR AND SUPPLY OF SCIENTIFIC AND TECHNICAL PERSONNEL

Under a grant from the National Science Foundation, we are studying methods by which one may explain or predict the supply and demand for technological professional workers. Our chief interest is in engineers and chemists, who together form at least nine-tenths of the persons with advanced knowledge of natural science and its applications.

The growth of the number of engineers and chemists has been immense, and retardation has been relatively slight for the engineers even in recent decades (Table 3). Over the last eighty years the number of chemists and engineers grew 17 times as fast as the labor force. It is not unusual for a new occupation to grow at a very rapid rate, but it is unusual for the rate of growth to be sustained at so high a level when the numbers involved approach 1 per cent of the entire labor force.

We have found that there is a marked stability in the pattern of differences among industries in the employment of engineers and chemists. Thus, the percentage of all employees who were engineers or chemists in each of thirty-one minor industry groups in 1930 was highly correlated with the corresponding percentage for the same industry in 1940 ($r = +.88$); and the 1940 percentages (for thirty-nine minor industry groups) were highly correlated with those for 1950 ($r = +.95$). Particularly in the second decade, when the number of engineers and chemists rose from 350,000 to 600,000, the stability of the inter-industry differences is most impressive.

The ratio of engineers and chemists to total labor force rose in nearly all industries be-

TABLE 3

THE GROWTH OF THE ENGINEERING AND CHEMICAL PROFESSIONS, 1870–1950

			Per Cent Growth in Decade	
Year	*Chemists*	*Engineers*	*Chemists*	*Engineers*
1870	774	7,094		
1880	1,969	7,061	154.4	−0.5
1890	4,503	28,239	128.7	299.9
1900	8,847	43,239	96.5	53.1
1910	16,273	88,755	83.9	105.3
1920	32,941	136,121	102.4	53.4
1930[a]	47,538	227,590	44.3	67.2
1940	60,005	277,872	26.2	22.1
1940[b]	56,825	291,465		
1950[b]	75,747	534,424	33.3	83.4

[a] Average of figures comparable to earlier and later years with respect to occupational classification.

[b] Chemists excluding metallurgists; engineers including metallurgists but excluding surveyors (who were 16,444 in 1940 and 26,229 in 1950). 1940 data from 1950 Census.

Source: Alba M. Edwards, *Comparative Occupation Statistics, 1870 to 1940*, Bureau of the Census, 1943, pp. 49, 111; *Census of Population*, 1940, Series P-14, No. 13; *Census of Population*, 1950, Vol. II, Part 1, Tables 124, 125.

tween 1940 and 1950, although by somewhat varying degrees. These variations are too small to offer much of a clue to the factors affecting the employment of engineers and chemists. However, we have investigated one disturbing factor – the number and relative growth of engineers and chemists engaged in research (as distinguished from those engaged in routine production or management operations) – on the hypothesis that engineers engaged in operating functions will be more closely correlated with an industry's labor force than those engaged in research. The available data tend to support this hypothesis, but more precise and comprehensive information is needed for a fully convincing test.

As is true for the working population as a whole, the engineering profession has experienced a large increase in money income over the last decade and a half (Table 4). The median salary of engineers declined about one-quarter between 1929 and 1934 but rose steadily thereafter, until by 1953 it had reached a level three-quarters above that in 1929.

This movement of the median salary for all engineers is a function of the changes in salary rates for engineers at each experience level and of the changes in the distribution of engineers among experience levels. With regard to the former factor, the data show substantial divergences in degree of movement over the period since 1929. Thus, although all three experience levels described in Table 4 underwent about the same decline in salaries between 1929 and 1934, salaries of older engineers (those with 30 to 34 years' experience) recovered more sharply by 1939 than did those of intermediate engineers (9 to 11 years'

TABLE 4

INDEXES OF MEDIAN SALARY FOR ALL ENGINEERS AND FOR ENGINEERS AT STATED EXPERIENCE LEVELS, SELECTED YEARS, 1929–1953
(1929 = 100)

Year	All Engineers (1)	Engineers with: Less than 1 Year's Experience (2)	Engineers with: 9 to 11 Years' Experience (3)	Engineers with: 30 to 34 Years' Experience (4)
1929	100.0	100.0	100.0	100.0
1932	81.3	74.5	78.6	81.4
1934	72.7	73.8	69.7	73.3
1939	95.8	85.9	82.2	103.6
1943[a]	115.6	146.3	115.4	117.4
1946	135.6[b]	155.0	129.9	131.2
1953	173.4[b]	238.5	178.0	162.6

[a] Including overtime.

[b] Other data for 1946, restricted to members of professional engineering societies (as in cols. 2–4), would yield an index of 141.5 for 1946 and an extrapolated value for 1953 of 181.0.

Source: Col. 1: 1929–1934, *Employment and Earnings in the Engineering Profession,* Bureau of Labor Statistics, Bulletin No. 682, 1941, p. 162. 1939–1943, Andrew Fraser, *The Engineering Profession in Transition,* Engineers Joint Council, 1947, p. 75. Data restricted to members of professional engineering societies. 1946, *Employment Outlook for Engineers,* Bureau of Labor Statistics, Bulletin No. 968, 1949, p. 49. 1953, 1946 value extrapolated by movement of median salary of graduate engineers between 1946 and 1953. 1946 data from Fraser, *op. cit.,* pp. 82, 83; 1953 data from *Professional Income of Engineers,* Engineers Joint Council, 1954, p. 12.

Cols. 2–4: 1929–1934, *Employment and Earnings in the Engineering Profession,* p. 167. 1939–1946, Fraser, *op. cit.,* p. 41. 1953, 1946 value extrapolated by movement of median salary of privately employed graduate engineers between 1946 and 1953. 1946 data from Fraser, *op. cit.,* pp. 46–48; 1953 data from *Professional Income of Engineers,* p. 14.

experience) and those of starting engineers.

Since 1939, however, the percentage increases in salary rates have been inversely related to years of experience. By 1953, starting engineers' salaries were 139 per cent above their 1929 level; intermediate engineers were earning 78 per cent more than their counterparts in 1929; and older engineers' earnings were only 63 per cent above their level in 1929.

This has meant, of course, that the salary differential for experience has decreased perceptibly. The ratio of intermediate engineers' salaries to those of starting engineers, which was 2.0 in 1929 and 1939, fell to 1.7 in 1946 and to 1.5 in 1953. The ratio of older engineers' salaries to those of new entrants into the profession rose from 2.8 in 1929 to 3.4 in 1939, but fell sharply to 2.4 in 1946 and to 2.2 in 1953. The decline in these differentials has important consequences for the engineering profession, including particularly the fact that expected life earnings of engineers have risen substantially less than is suggested by an analysis of changes in starting salaries alone.

DAVID M. BLANK
GEORGE J. STIGLER

UNION MEMBERSHIP

The text of "Half-Century of Union Membership" is now being written, and the manuscript should be ready shortly. This study deals with the annual membership of labor unions in the United States from 1897 to 1954 and with union membership in foreign countries for selected dates in the last twenty years. Although the growth of unions has been a world-wide phenomenon, the proportion of the civilian labor force in unions by 1950 varied greatly in different countries. As the table at the bottom of the page shows, Sweden was the most highly organized and Canada and the United States were the least organized among the countries included.

LEO WOLMAN

OTHER STUDIES

Personal Income during Business Cycles, by Daniel Creamer, which deals in part with wages, unemployment compensation, and other forms of labor income, and Harold Barger's monograph, *Distribution's Place in the American Economy since 1869,* are in press. *The Growth of Public Employment in Great Britain,* by Moses Abramovitz and Vera Eliasberg, is being prepared for press. Clarence D. Long's manuscript, *The Labor Force under Changing Income and Employment,* will shortly be ready for review by the Board.

Wages in Germany, 1871–1945, by Gerhard Bry, is being edited, and the conference proceedings volume, *The Measurement and Behavior of Unemployment,* also is being prepared for publication. A new study of activities in the labor market during business cycles is described in Part Two.

UNION ORGANIZATION IN EIGHT COUNTRIES

	Estimated Total Civilian Working Population (thousands)	*Estimated Total Union Membership (thousands)*	*Per Cent Organized*
Sweden (1950)	3,120	1,550	49.7
Australia (1947)	3,196	1,366	42.7
United Kingdom (1950)	22,264	9,243	41.5
Italy (1949)	17,943	7,047	39.3
France (1946)	20,103	6,250	31.1
West German Republic (1950)	22,074	5,761	26.1
United States (1950)	63,099	13,834	21.9
Canada (1950)	5,156	1,029	20.0

4. *Banking and Finance*

RESEARCH IN THE CAPITAL AND SECURITIES MARKETS

The report under the above title, by the Exploratory Committee on Research in the Capital and Securities Markets, was published in December. The Committee, working under grants from the Investment Bankers Association of America and the National Association of Securities Dealers, makes proposals for keeping up to date certain bodies of basic financial information that have been developed in investigations of the last ten years and for extending research into new areas.

The leading suggestions for keeping information up to date concern data on savings by type and by principal groups of savers; estimates of the flow of savings through financial institutions; statistics on corporate bond offerings, extinguishments, and experience; data on security offerings; stock ownership statistics; estimates of trading activity in over-the-counter markets; characteristics of security transactions; and financial data on brokers and dealers. Among the areas that have been singled out by the Committee as requiring additional research are the structure and problems of investment banking and the securities business; the flow of investment funds, and the changes therein, in the capital and securities markets; certain selected institutions of the capital and securities markets; investor preferences, policies, and experience, for both financial institutions and individuals; the financing policies and preferences of American business; the market for government securities – federal, state, and local; the impact of regulation on the securities markets; and the relation of the capital and securities markets to economic growth and stability.

The Committee's report has been given wide circulation, with the hope that it will stimulate research in many institutions and by many independent investigators. It is accompanied by an extensive list of studies of capital and securities markets problems that have been completed in the last eight or ten years or on which work is still in progress. This inventory of recent research should provide a handy reference list not only for teachers and students of finance but also for those who, for some practical reason, wish to explore research results in a specific area.

R. J. SAULNIER

CORPORATE BOND RESEARCH

The Corporate Bond Research Project, which is being completed with the support of a grant from the Merrill Foundation for Advancement of Financial Knowledge, has progressed according to plan, and all work should be finished during the coming year. The end product of the investigation will be monographs covering most of the measurable aspects of corporate bond financing during the present century. The first report – *The Volume of Corporate Bond Financing since 1900* – was published in 1953. It presented aggregate statistics on new bond offerings, extinguishments, and outstandings; and on the volume of new defaults, default settlements, and bonds outstanding in default. The report also presented estimates of money flows to and from business corporations that arose from the flotation, servicing, and retirement of funded corporate debt. The materials were analyzed against the broad background of economic events during the present century, with particular attention given to secular drifts and cyclical ups and downs.

The second report of the series – "Corporate Bond Characteristics and Investor Experience" – has been completed and submitted to the Director of Research. Its purpose is twofold: first, to trace movements in the volume of securities offered and outstanding that had various specific characteristics; and second, to examine the experience of investors who might have held securities of different types. In order to determine the volume and characteristics of corporate bonds eligible for pur-

chase by financial intermediaries, such as life insurance companies, mutual savings banks, personal trust accounts, etc., particular attention is given to quality bonds (bonds rated as high-grade by the investment rating agencies, bonds eligible for savings bank and personal trust investment in selected states, and bonds rated as high-grade by the market). In addition, the book analyzes new materials bearing on such characteristics as minor industry group, size of issue, asset size of obligor, earnings coverage, and type of security (secured, unsecured, junior lien, etc.). Cross-classifications of offerings and outstandings are presented, showing, for example, the industrial composition of rated bonds, their legal status, exchange listing, and so on. Paralleling the analysis of bond characteristics is an account of what the experience of investors might have been had they purchased the different types of issues, as indicated by records of price, obligors' payments of interest and principal, and so on. Measures are presented of important aspects of investor experience: the frequency of default, the yield promised by the obligor to maturity compared with the yield actually obtained by the investor, and the extent of his capital gain or loss.

The report is essentially an analytical volume based on a more extensive body of statistical materials than can be presented in a single book. The supporting data – together with notes on methods of derivation and suggested uses – will be published as a third report, "Statistical Measures of Corporate Bond Characteristics and Experience." The tables for this volume have been completed and are now being checked and edited for publication.

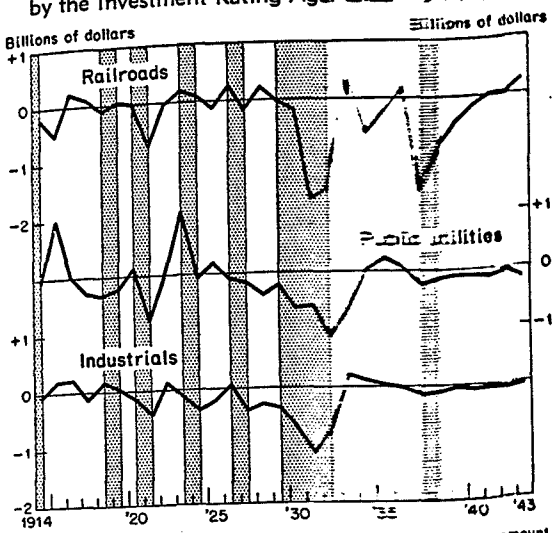
Preceding annual reports have commented upon some of the earlier conclusions of our investigation of bond characteristics and experience; during the year, these conclusions have been amplified and extended in new directions. With great regularity, corporate bonds show similar behavior patterns when classified under the different rating systems. No matter whether quality is measured by agency rating, legal status, or the rating assigned by the market, high-grade issues had lower default and loss rates than low-grade issues. On the other hand, the high grades also had lower promised yields than low grades, and lower life-span yields realized from offering to extinguishment. The implication of this finding is that large institutional investors – particularly those not concerned with the short-run liquidity of their holdings – could have obtained higher average realized yields on low grades than on high grades, despite temporary embarrassment caused by the low-grade issues that went into default. Because of the large losses suffered on individual low-grade issues, however, small investors would have minimized risk by concentrating on high-grade issues.

Similar conclusions flow from our investigation of size and corporate bond experience: the large issues, and issues of large obligors, have lower default and loss rates than other issues, and lower promised and realized rates of return. Classification of bond issues by earnings coverage at offering also reveals comparable patterns: issues with high times-charges-earned ratios at offering, and high ratios of net income to gross income, had better default records than other issues but poorer yield experience. An analysis of the relationship between the security behind bond issues and subsequent investor experience revealed negligible correlation when comparisons of the different lien-position groups were based on all issues; but in default situations, unsecured issues did not work out so well as secured issues. In effect, issues well secured as to earnings had lower default rates and yields than other issues, but among issues that went into default, higher realized returns were obtained on the secured issues.

Comparisons of the characteristics of bonds offered or outstanding in business expansions and contractions provide definite evidence of a perverse credit cycle in the bond market. Thus over each of the business cycles spanned by our data, the investment rating agencies upgraded bond issues in good times and downgraded them in bad (Chart 8), despite the fact that agency ratings are thought to measure

CHART 8

Estimated Net Upgrading of Straight Corporate Bonds by the Investment Rating Agencies, 1914–1943



Net upgrading is that part of the annual net change in the par-amount total of bond outstandings rated in the four best grades that is attributable to revision of agency ratings of outstanding issues. Positive values indicate an excess of upward over downward revisions; negative values, an excess of downward over upward revisions. The investment rating used is a composite of those of Fitch, Moody's, Standard Statistics, and Poor's.

Shaded areas represent contractions in general business activity, and white areas, expansions.

"intrinsic" quality, which is presumably independent of the cycle. Issues on the Massachusetts and New York legal lists and those rated high-grade under the market rating, were stable with respect to general business, but Maine legals were regularly added or deleted, depending upon the ups and downs of the cycle. Similarly, the proportion of total bond offerings that had low earnings coverage rose during business expansions and fell during business contractions, despite the fact that total bond offerings conformed inversely to the business cycle. Surprisingly, some evidence of the perverse credit cycle can be detected even in the types of securities offered. In particular, the railroads relied more heavily on debentures during business expansions and appear to have reserved part of their prior-lien obligations for emergency financing in business contractions. The evidence thus suggests that the psychology of bond investors, of rating agencies, and to some extent of obligors as well, was strongly influenced by the tempo of business activity, so that investment standards were raised and lowered in inverse conformity to the business cycle.

The perverse cycle in credit standards is particularly striking in view of the inverted character of total bond financing – the fact that on balance more funds were supplied to borrowers by the bond market in contractions than in business expansions. This implies that the better credit risks turned to the bond market in times of stress, and relied on other forms of financing such as the stock market when business was expanding. Nevertheless, credit blockages appear to have developed in the bond market when business activity was declining that were not present when business was expanding.

W. Braddock Hickman

BANK CAPITAL PROBLEMS

The study of bank stock prices, which constitutes one phase of the investigation of bank capital problems, a project supported by a grant from the Association of Reserve City Bankers, is now nearing completion. During the year, a manuscript entitled "Bank Stock Prices and the Bank Capital Problem" was circulated for criticism.

The economic findings of this study are all related, in one way or another, to the cost of bank equity capital. The immediate goal of the study is a systematic analysis of the ratio of price to book value during the period 1946–1953, when many bank stocks were selling at discounts from book value and many bankers were therefore reluctant to float new stock issues for fear of thereby diluting the stockholders' equity. Since market discounts are related to the rate of return on bank equity and to the proportion of bank earnings paid out in dividends (one would naturally expect them to be, and the study bears it out), the connection between discounts from book value and the cost of equity is fairly obvious. What rate of return does bank equity have to earn and pay in order that new stock issues can be readily floated in the market without jeopardizing the position of the stockholders through dilution? Thus posed, the question is, perhaps, a bit ambitious, but the regression analy-

sis used in the study provided at least rough answers to the related question: What rates of earnings and dividends are required to support bank stocks at book value? Estimates of these required rates are presented in the manuscript for six groups of bank stocks at yearly intervals from 1946 to 1953.

Not only does the regression technique provide the means of estimating the rates of earnings and dividends required to support bank stocks at book value, but it provides the means of estimating, further, how these required rates may be modified by various strategic factors – such as size of bank, the ratio of deposits to capital, or the ratio of risk assets to capital. In fact, one of the important questions posed at the beginning of the study concerned the possibility of a relation between bank stock prices and one or more of the bank capital ratios. It seemed altogether likely that the market might prefer, other things equal, the stocks of banks with moderate capitalization ratios – that is, neither too conservative nor too far extended; and should this preference manifest itself in the market price, it would imply a lower cost of equity for moderately capitalized banks than for banks with extreme capitalizations on either side. But in point of fact, the statistical tools used in the study have been unable to detect any such market preference; hence, the relation of bank capitalization to stock prices and cost of equity remains one of the unanswered questions.

One interesting and important result of the study is the large amount of variation observed among the six groups of stocks analyzed. For example, although the dividend payout ratio in general appears to be an important determinant of the price of bank stocks and the required rate of earnings, it does not appear important for the group of seventeen New York City bank stocks in most of the eight years covered. The significance of such results lies in the implication that bank stocks do not constitute a homogeneous population and that important exceptions are to be expected to any generalization that may be drawn. Not only do the various group patterns differ significantly from the average, but occasionally individual stocks within a group seem to differ significantly from the pattern of that group.

An article on a statistical problem encountered in the study was published in the *Journal of the American Statistical Association,* March 1954, under the title "Joint Confidence Regions for Multiple Regression Coefficients." A second article covering another specialized problem was published in *Econometrica,* January 1955, under the title "Bank Stocks and the Analysis of Co-Variance."

Another phase of the study, the compilation and analysis of historical data on the sources of bank capital, is expected to be completed this spring. This part of the work has been undertaken in cooperation with the Board of Governors of the Federal Reserve System, under the direction of Robert Moss of the Board's staff.

DAVID DURAND

URBAN REAL ESTATE FINANCE

Five monographs in the series, *Studies in Urban Mortgage Financing,* have been published. Two manuscripts remain to be completed: Edward E. Edwards' "Urban Real Estate Financing by Savings and Loan Associations," and Wolfgang Stolper's "Economic Fluctuations and Urban Real Estate Finance." The capstone volume, *Urban Mortgage Lending: Comparative Markets and Experience,* by J. E. Morton, is in press.

Those portions of Morton's study that deal with mortgage lending experience are based on sample survey data covering the years 1920–1946, and the broad outlines of the real estate market as it exists today are sketched in with the help of later information, including data from the Survey of Residential Financing made in connection with the 1950 census. The 1950 data reveal some surprising turns of events in the real estate situation. They show, for one thing, the extraordinary increase during the decade 1940–1950 in the spread of home ownership in the United States. Fifty-three per cent of the units of known tenure

were reported as owner-occupied in the 1950 census, as against 41 per cent in 1940. And the last four years have seen an extension of this trend, possibly by as much as in the full decade 1940–1950. Some rented quarters we will always have, of course, but we seem to be moving at a quickening pace toward what will be to all intents and purposes a "nation of homeowners."

Putting aside the temptation to comment on the social and political implications of this trend – matters which afford an exciting range of suppositions – what are its financial connotations? The skeptic might observe that if we are to be a nation of homeowners, undoubtedly the homes will be mortgaged, and heavily mortgaged. But this view must confront certain facts from the 1950 census. There we find, surprisingly enough, that the percentage of dwellings (of known mortgage status) that were reported as mortgaged was lower in 1950 than in 1940 (44 as against 45 per cent) and not much higher than the percentage reported for 1920 (40 per cent). Furthermore, the national ratio of debt to value for mortgaged properties was lower in 1950 than in 1940.

In both cases the facts differ for different sections of the country. The older areas – New England, the Middle Atlantic states, and the North Central states – show the lowest frequencies of mortgage indebtedness and the lowest ratios of debt to value. It is in the areas of more rapid population growth and higher rates of building activity – notably the Southwest and West – that one finds the highest incidence of mortgage financing and the lowest ownership equities.

Mortgage debt has grown so rapidly since the 1950 census was taken, and the early fifties have been so vividly marked by financing on small down payments and long maturities, that a census taken today might well show a different picture; but it is at least of interest that the great housing booms of recent years – if the 1950–1951 and the current booms can be regarded as separate incidents – started from a credit base not less favorable than that of 1940 and not greatly different from the 1920 situation. However, there is more in these figures to trap the unwary than the normal degree of unreliability. Any impulse to interpret the trend of debt-to-value ratios as a positive strengthening of the nation's home credit base is restrained by the fact that these ratios were "improved" in the years immediately following the war by a very considerable inflation of real estate values. For this reason they may, perhaps, be especially vulnerable to downward pressures.

R. J. SAULNIER

AGRICULTURAL FINANCE

Two of the studies under the Agricultural Finance Project have now been published: *Costs and Returns on Farm Mortgage Lending by Life Insurance Companies, 1945–1947,* by R. J. Saulnier (Occasional Paper 30), and *Mortgage Lending Experience in Agriculture,* by Lawrence A. Jones and David Durand. Howard G. Diesslin's *Agricultural Equipment Financing* (Occasional Paper 50) is in press, and Donald C. Horton's "The Pattern of Farm Financial Structure" is also expected to be published in 1955.

Diesslin's monograph surveys the facilities now available for the financing of farmers' purchases of equipment and the terms on which these credit purchases have been, and are currently being, made. The study is of special interest in its evidence that we seem, at long last, to have developed financing arrangements that require only modest extensions of credit by the manufacturers themselves. At the present time, the bulk of the financing of farm equipment purchases is done by banking institutions or by specialized subsidiaries of the implement producing companies, these subsidiaries serving in a manner similar to that of the sales financing subsidiaries of automobile manufacturing companies. The interesting question why it took so much more time for financing facilities to be worked out in this field than it took to develop comparable facilities for the installment purchase of automobiles – a credit transaction with marked similarities – is discussed in the introduction.

Progress on the capstone volume in this series is reported by George K. Brinegar below.

Agricultural Credit Institutions

Preliminary work on several major sections of this study was completed by George Hanc before he entered military service in May. My work on the project has been largely devoted to an investigation of the policies of agricultural lenders. A second interest which has been touched upon, with the help of Millard Hastay, is the development of a technique of estimating the effects of income pattern and terms of loan upon risk to the lender and borrower.

Lending policies change over time, and also differ significantly among the several types of lenders providing agriculture with funds and among institutions within those groups. Evidence is at hand in statements of lending policy and purpose, in the lending procedures and practices followed by the lenders, and in the figures showing the amounts of funds they have supplied.

The first steps in analyzing lending policy are to determine what has happened and to distinguish the causal factors. The major changes which have occurred in the agricultural credit markets during the past forty or fifty years are: (1) The cost of credit has been reduced, (2) the terms under which credit is extended are more varied and more exactly tailored to the borrowers' needs, (3) an increased percentage of the market is served by lenders who obtain their funds from national rather than local markets, and (4) short-term (non–real estate) loans are more in use, and mortgage loans relatively less so, than they were forty years ago.

Behind the trends are causal factors of two types. First are the so-called outside factors consisting of the technology of agriculture, the behavior of the agricultural and other sectors of the economy, and the ideas which people hold about what is and what ought to be. Second are the competitive relationships among lenders. Here federal and federally sponsored agencies and life insurance companies have played major roles. An attempt to analyze this interesting but complex set of relationships is in process.

GEORGE K. BRINEGAR

OTHER STUDIES

Thomas R. Atkinson's study of "The Pattern of Financial Asset Ownership: Wisconsin Individuals, 1949" has been revised after staff review and is about to be submitted to the Directors.

The collaborative study on "Federal Programs of Lending, Loan Insurance and Loan Guarantees," by R. J. Saulnier, Neil H. Jacoby, and Harold G. Halcrow has been revised after staff reading. The data on the volume of federal credit activities which were developed as part of this study have been extended to the end of 1953 and the entire work is being reorganized.

Other studies dealing with money, banking, and finance are reported in Sections 1 and 2. A new study of the postwar capital markets is briefly described in Part Two.

5. *Governmental Activity and Finances*

THE INDIVIDUAL INCOME TAX

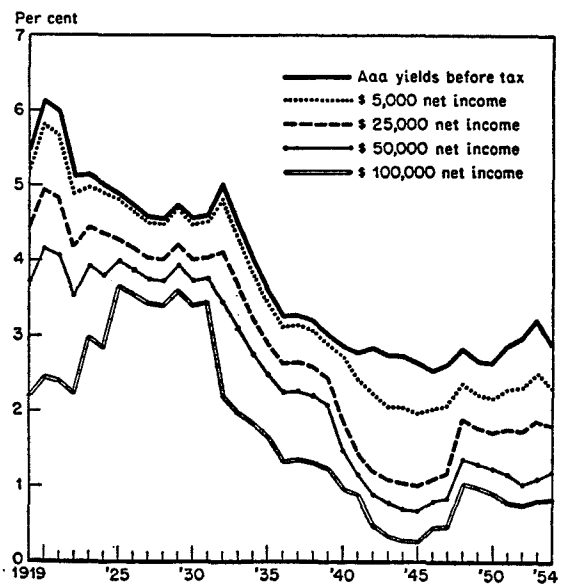
In our studies of the individual income tax, which are designed to present quantitative historical accounts of the principal elements of the tax, we have found it interesting and enlightening to consider the tax in relation to each of the major components of taxable income as well as in relation to the totals. These components include wages and salaries, dividends, interest, profits of unincorporated business, rents and royalties, and capital gains and losses. Recently I completed a revision of a

study of individuals' interest income for possible publication as an Occasional Paper, and below I summarize one phase of it.

The record since 1929 offers interesting material concerning the effects, under some conditions, of rising income tax rates upon the investment behavior of individuals. The pronounced increase in personal income tax rates in the 1940's took place after interest rates had declined markedly for most of a decade and were still falling. In consequence the after-tax or "take-home" yields obtainable by individuals from fixed-interest investments suffered a sharp compound reduction. In 1929 a married man with two dependent children could obtain a marginal after-tax yield of 4.71 per cent from a moderate investment in the average of Moody's Aaa corporate bonds if his statutory net income from other sources was $5,000, a take-home yield of 4.21 per cent if his income was $25,000, and one of 3.93 per cent if it was $50,000. By 1950 these after-tax yields had shrunk to 2.16, 1.71, and 1.21, respectively. The shrinkage was even greater at higher levels of income (Chart 9).

CHART 9

Market Yields of Moody's Aaa Corporate Bonds Compared with Their Marginal After-Tax Yields to Individuals with Selected Net Incomes, 1919–1954 (Married, with 2 Dependent Children)



Nevertheless, individual investors as a whole added very much larger amounts to their holdings of fixed-interest securities during the 1940's than in any previous decade. They expanded their ownership of federal securities from $10.1 billion at the end of 1939 to $66 billion at the end of 1950. This increase was some $11 billion greater than the entire net federal debt outstanding at the end of 1939, about $11 billion greater than the entire amount of net long-term corporate debt outstanding on that date, and some $3 billion greater than the sum of all farm, residential, and commercial mortgage debt and state and local government securities then outstanding. It would seem that, in the whole complex of forces operating during the 1940's upon the disposition of individuals to invest in fixed-interest securities, the deterrent influence of sharply reduced take-home yields was less important than the sum of the other forces.

The "other" forces included the exceptional ones arising from World War II. Between mid-1939 and mid-1946, the total amount of adjusted demand deposits and currency in circulation (outside of banks) more than tripled. Extensive government restrictions were imposed upon business and consumer spending and upon prices. The result was that investors not only had powerful patriotic motives and swollen financial resources to invest heavily in United States government securities during the war: they had only limited opportunities in the aggregate to spend or invest otherwise until the later 1940's.

We may note that in the case of United States savings bonds, which accounted for the bulk of individuals' direct investments in fixed-interest securities, the deterrent influence of the combination of high income tax rates and relatively low interest rates was weakened by the option given holders to postpone tax liability for the accruing interest until redemption. Further, the seeming disposition and ability of some taxpayers to avoid reporting this and other kinds of interest receipts further tended to reduce the restrictive effect, however great or little it would otherwise have

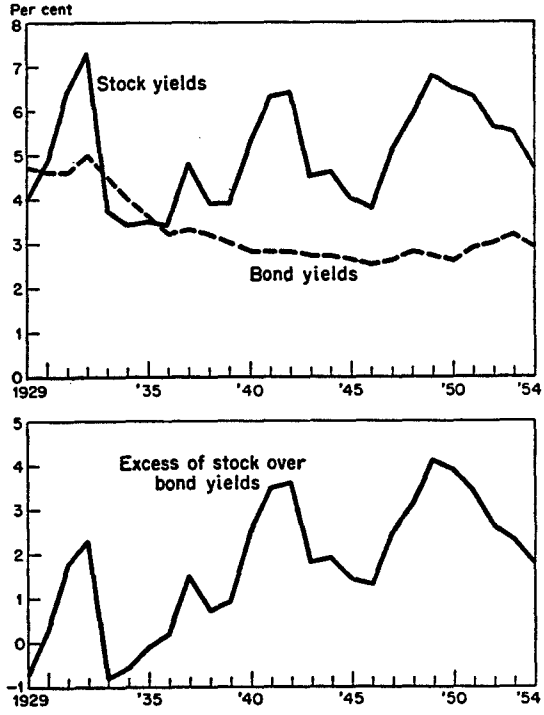
been, of the higher tax rates and lower interest rates upon fixed-interest investment.

In contrast, despite their close conceptual and competitive relationship to interest rates, the yields obtainable from common stocks behaved quite differently. Stock yields moved generally upward between 1936 and 1949, both before and after allowance for personal income taxes, though with occasional important reverses, while interest rates were falling almost uninterruptedly. The average yield of Moody's list of 125 representative industrial common stocks, which had been 4 per cent in 1929 and about 3.4 per cent in 1934–1936, rose to 6.4 per cent by 1942. After declining in the next four years to 3.8 per cent, it rose sharply again to reach 6.8 per cent in 1950, whence it declined to 6.3 in 1951, 5.6 in 1952, 5.5 in 1953, and 4.7 in 1954. Except in 1942–1946, common stocks offered a generally widening differential in yield over high-grade bonds until after 1950 (Chart 10). The dividend return from Moody's representative industrial common stock average had been somewhat *below* the yield of Moody's Aaa corporate bonds in 1934 and 1935 and only slightly above in 1936. By 1949 it was well over twice that offered by the bonds, and the absolute difference between the average market yields of the stocks and bonds had risen to more than 4 full percentage points.

Although the high level and steeply graduated scale of the personal income tax tended to narrow this difference after allowance for taxes, the spread before income tax became sufficiently wide to give common stocks a substantial advantage in current after-tax yield. A married man with two dependent children could have obtained a marginal *after-tax* yield of 5.8 per cent in 1950 from a moderate investment in Moody's list of representative industrial common stocks if his income from other sources was $5,000; 4.26 per cent, if $25,000; and 3.01 per cent, if $50,000. For the same individuals, as previously noted, Moody's Aaa corporate bonds offered after-tax yields of only 2.16, 1.71, and 1.21 per cent respectively.

CHART 10

Comparison of Moody's Aaa Bond Yields with Dividend Yields of Moody's 125 Representative Industrial Common Stocks, 1929–1954



Source: *Survey of Current Business*, Dept. of Commerce.

But the very persistence of generally high and rising stock yields in the face of much lower and declining bond yields would seem to be conclusive evidence that investors as a whole, institutional and individual, showed a strong preference for bonds as against stocks at any but substantial yield differentials. We lack reliable figures for individuals' additions to their holdings of corporate stocks during the 1940's, but the Securities and Exchange Commission has estimated that their holdings of corporate stocks, bonds, and other nongovernment securities as a whole rose by less than $2 billion during the period.

Two factors that should logically have operated to discourage equity investment were (1) the tendency of the increased tax rates to reduce the net yield advantage, after taxes, of higher-yielding risky investments over lower-yielding safer ones, and (2) the disallowance of capital losses as deductions against ordinary income except in the maximum sum of $1,000 a year. When a taxpayer is subject to

a 50 per cent rate on the next increment of his income (which was the 1950 bracket rate for a single taxpayer with net income a little over $20,000 and for a married couple filing a joint return with twice as much), the difference in marginal tax yield between a speculative stock returning 7 per cent before income tax and a safe bond yielding 3 per cent drops from 4 to 2 percentage points. In cutting the take-home yields to 3½ and 1½ per cent, respectively (assuming an addition to income no larger than the width of one tax bracket), the tax leaves their relative size unchanged, but it nevertheless bears more heavily upon the risky income. A portion of the latter may be properly regarded as a kind of insurance premium or reserve required by the investor to cover the losses of income and capital he is likely to experience in the long run in connection with such investments. Instead of obtaining a continuing 7 per cent yield before taxes, he may expect in the long run to average perhaps only 5 per cent. Particularly in view of the limited deduction allowed for capital losses, it is from the *absolute* excess of yield after taxes offered by the risky over the safe security (and from possible capital gains on other investments) that the investor can hope to obtain the funds to make good his capital losses, not from the *relative* yield advantage. When this absolute margin is reduced, rising or high rates of income tax, particularly if accompanied by severe limitations on the allowance for capital losses, may logically be expected to influence investors to favor safer securities or, what amounts to the same thing, to insist upon compensatory increases in the before-tax yield differentials offered by risky over safe securities.

To take an extreme illustration, consider an investor subject to a tax of 90 per cent on his next increment of income. If he chooses a risky investment with a market yield of 7 per cent over a safe one yielding 3 per cent, his after-tax yield will continue to be two and one-third times as large on the former as on the latter, but the absolute difference in after-tax yields will be only four-tenths of 1 per cent — a margin that could hardly provide significant reserves against capital losses.

Another portion of the market yield differential offered by risky over safe investments may be viewed as the compensation of the venturesome investor for the service of assuming unpopular risks and uncertainties. Without denying that the supply of this service may be responsive to the *relationship* between the yields of risky and safe investments apart from their absolute levels, surely we may suppose that it is also significantly responsive to the *absolute* rate of take-home compensation offered for it. To use our previous hypothetical example, a gross advantage in after-tax yield of less than four-tenths of 1 per cent (to allow something for reserves against possible capital losses) could not reasonably be expected to attract so much venturesome investment as a bigger absolute differential in yield.

The foregoing considerations apply most directly to investments that promise their rewards mainly in the form of more or less regular incomes. But a considerable proportion of risky investments are expected to produce much or all of their yield in the form of capital gains, which may be loosely defined as the profits obtained by selling stocks, bonds, land, or other property not a part of the seller's stock-in-trade for more than they cost him. Such gains are taxed at very much lower rates than ordinary income in the United States (one-half or less, provided the property is held more than six months) and in most other countries, and completely exempted from income tax in some of them. In consequence, risky investments promising much of their return in this form offer investors the possibility of take-home yields that are substantially larger than those obtainable in the form of current income from either safe or risky investments. The combination of high tax rates on ordinary income and low ones on capital gains thus tends to discourage some forms of risky investment and to encourage others.

When yields on common stocks fail to move in the same direction as yields on high-grade bonds, a part of the explanation is doubtless to be sought in the changing prospects for

capital gains. When these prospects include severe uncertainties or a deteriorating business outlook, high or rising stock yields may persist in the face of low or declining interest rates, as in most of the period between 1929 and 1949. The opposite movements may occur when business prospects are regarded more favorably by investors, as was presumably the case during the rise in stock prices and decline in stock yields in the face of firming interest rates in 1949–1954.

C. Harry Kahn has worked during much of the year on a study of the rate structure of the individual income tax. Perhaps the most striking development brought out in this work has been the great increase in the level and revenue importance of the starting rate, that is, the rate applicable to the first bracket of taxable income. This rate rose twentyfold between 1913 and 1954. Prior to World War II the amount of income tax liability accounted for by the starting rate alone ranged typically from somewhat over one-tenth to one-third of the total. That is to say, a flat rate equal to the starting rate and applied to the total of taxable income would have produced these proportions of the total tax liability. By 1944 the starting rate is estimated to have accounted for approximately 83 per cent of the total individual income tax liability, and the graduated rates above the starting rate for only 17 per cent. Over the eight-year period 1943–1950, approximately four-fifths of the total tax liability resulted from the starting rate alone.

LAWRENCE H. SELTZER

THE TAX TREATMENT OF STOCKHOLDERS

The revision of the text of "The Tax Treatment of Stockholders, 1940–1950," has been completed, and the manuscript is now being prepared for submission to the Directors. A paper incorporating some of its major findings was presented at the annual meeting of the American Economic Association in December 1954. Upon completion of the study we plan to turn to an analysis of dividends under the personal income tax.

The manuscript contains a chapter analyzing the relief provisions of the Internal Revenue Code of 1954, since the materials and methods developed in the book can be readily applied to this purpose. Following a proposal in the President's budget message for fiscal 1955, Congress amended the tax law to provide stockholders with some relief from the "double taxation" of dividends. Under the new provisions the first $50 of dividends received from domestic corporations (the first $100 for joint returns) is excluded from taxable income, and, further, stockholders are given a credit against personal income tax equal to 4 per cent of the remainder of their dividend receipts.

Thus relief is provided only for distributed earnings, and only a portion of the problem of the differential taxation of corporate earnings is dealt with.[1] But what measure of relief is provided for stockholders, and how does it affect stockholders at different income levels? A brief summary of our analysis of this question may be of interest.

The severity of the condition that the new provisions were designed to relieve – "double taxation" – varies inversely with the stockholder's income level. For example, assuming for simplicity a corporate tax rate of 50 per cent, for every 50 cents of dividends paid out, a dollar had to be earned. This dollar already carries a corporate tax of 50 cents, and in the lowest personal income tax bracket – 20 per cent – an additional tax of 10 cents on the 50 cents of dividends paid out would be forthcoming. So in all, in this marginal rate bracket, a dollar of earnings made for distribution carries a combined corporate-personal income tax liability of 60 cents. Had an additional dollar been obtained from other sources, say bond interest, the tax on it would have been 20 cents. So the "extra" burden, in this sense, is 40 per cent of earnings made for distribution.

[1] Also, no relief is afforded stockholders who are exempt from the personal income tax because their income is too small or for other reasons.

What is the situation for the taxpayer at the top of the personal income tax rate schedule, where the marginal rate is, say, 90 per cent? Here, with the corporate tax unchanged at 50 cents, the personal tax on dividends is now 45 cents, so the total income tax on a dollar of earnings for distribution is 95 cents, while the personal income tax liability on a dollar from other sources would be 90 cents. Hence the "extra" burden is only 5 cents, or 5 per cent. The higher the stockholder's income, the lower the "extra" burden.

The relief provisions of the Internal Revenue Code of 1954, however, are not directly geared to this relation. Since the tax credit is 4 per cent of dividends, and therefore, under the assumed corporate rate of the examples, 2 per cent of their pretax equivalent, it would provide a flat 2 cents of relief per dollar of earnings made for distribution at all levels of stockholders' income. Thus, in the 20 per cent bracket it would lower the extra burden by 5 per cent, and in the 90 per cent bracket by 40 per cent. Clearly, the higher the stockholder's income, the greater the degree of relief.

Similar results follow from the exclusion provision, for the tax saving runs from 20 to 90 per cent of dividends, which would be equivalent to 10 to 45 per cent of net corporate earnings, the lower value applying at the lowest marginal rate bracket, the higher value at the top of the rate schedule.

So far the discussion has run in terms of marginal dollars of earnings for distribution. The over-all result, however, is a more complicated story, because it depends on how heavily each element of relief – the tax credit and the exclusion provision – is weighted in the total relief granted, and this, in turn, de-

TABLE 5

EFFECT OF RELIEF PROVISIONS OF INTERNAL REVENUE CODE OF 1954 ON NET "EXTRA" BURDEN ON EARNINGS FOR DISTRIBUTION, ESTIMATED FROM 1950 DATA[a]

	Net Corporate Earnings Component of Stockholder Income[b]		*"Extra" Burden on Earnings for Distribution*[c]		*Reduction in "Extra" Burden Due to Relief*	
"Average" Stockholder Income[b] (1)	*Total* (2)	*Earnings for Distribution* (3)	*Before Relief* (4)	*After Relief* (5)	*Absolute* (4 — 5) (6)	*Relative* $\left(\frac{6}{4} \cdot 100\right)$ (7)
$ 1,000	$ 180	$ 70	34.1%	24.1%	10.0%	29.3%
3,000	627	242	34.1	27.6	6.5	19.1
5,000	975	376	33.8	28.3	5.5	16.3
10,000	3,480	1,343	32.8	29.3	3.5	10.7
15,000	5,640	2,176	32.1	29.1	3.0	9.3
25,000	11,550	4,458	29.2	26.3	2.9	9.9
50,000	29,850	11,519	24.9	22.3	2.6	10.4
100,000	70,000	27,013	19.1	16.6	2.5	13.1
250,000	190,250	73,418	13.2	10.8	2.4	18.2
500,000	440,500	169,989	10.0	7.6	2.4	24.0

[a] Weighted average of joint and separate returns.

[b] Derived by interpolation from the data for stockholders to whom we have imputed their full pro rata share of net corporate earnings, i.e. dividends, corporate saving, and corporate income tax (column 2). Stockholders have been rearrayed in those income classes in which they fall after imputation, and averages for the classes are struck and used in the interpolation. By allocating the corporate tax proportionately between dividends and retained earnings we obtain their pretax equivalents – earnings for distribution and earnings for retention. The analysis of the effect of the relief provisions is limited to earnings for distribution (column 3).

[c] The "extra" burden is equal to the excess of the corporate tax on earnings for distribution plus the personal tax on dividends over the potential personal income tax on earnings for distribution, taken as a percentage of earnings for distribution. In other words, it is the difference between the actual corporate-personal tax on earnings for distribution and the tax liability that would have been due had this component of income been subject in full to the personal income tax alone.

pends on the size of the earnings-for-distribution component of stockholders' income. Per dollar of earnings for distribution, the exclusion gives greater relief than the tax credit at all income levels. However, its absolute amount is limited.

To determine how much relief, all things considered, will be provided by the Internal Revenue Code of 1954, its provisions have been applied to our "average" stockholder data for 1950, this being the most recent year for which the necessary tabulations are available (see Table 5). That is, the "extra" burden has been measured as it was then, and as if affected by the new code.

Despite the fact that the exclusion affords relief that increases in absolute importance the higher the stockholder's income and the credit provides the same amount of relief per dollar of earnings for distribution at all income levels, we find that in the aggregate, the relief furnished by the Internal Revenue Code of 1954 leads to an absolute reduction in the "extra" burden that is largest at the lowest income level and least at the top of the income scale (column 6). This occurs because the weight of the exclusion in the total relief furnished is a declining function of income.

But if we consider the relief relative to the severity of the condition it is designed to ameliorate, a different picture emerges. Here the relation between the degree of relief and stockholders' income is U-shaped. Proportionately the greatest relief occurs at the bottom and top of the income scale, with a lesser degree of amelioration in between (column 7). This is a matter of weighting. For the lower "average" stockholder incomes, where the absolute amount of earnings for distribution is small, the exclusion, which gives more relief per dollar of earnings for distribution, far outweighs the credit in importance. Hence the relatively high degree of relief observed. Near the top of the income scale the strength of the relief is explained by the fact that the "extra" burden becomes steadily smaller as the size of stockholder income increases, while the absolute amount of relief is substantially the same as at lower income levels (columns 4 and 6).

DANIEL M. HOLLAND

GROWTH OF GOVERNMENTAL ACTIVITY

Exploratory studies of the growth of governmental activity in several countries were initiated in 1951 with the aid of a grant from the Ford Foundation. A report on one of these studies, *The Growth of Public Employment in Great Britain,* by Moses Abramovitz and Vera Eliasberg, will shortly go to press. Its chapter headings run as follows:

Chapter

1 The Measure of Government
2 Government in Nineteenth-Century Great Britain
3 The British Government since 1891: A General View
4 The British Government, 1891–1950
5 The Local Governments, 1891–1950
6 The Nationalized Industries and Services
7 A Comparison of Government Employment in Great Britain and the United States, 1900–1950

A companion monograph on the growth of British governmental expenditures, by Alan T. Peacock of the London School of Economics, is reported on below.

British Government Expenditure, 1890–1950

The monograph now being prepared begins with a discussion of the scope and method of the study in which particular attention is paid to such problems as the definition of government used in the study, the sources of material, and the difficulties of computation. The main body of the report consists of the following sections:

1. THE GOVERNMENT AND THE SOCIAL ACCOUNTS, 1900 AND 1950

Over the past half-century the position of government in the economy has changed. Social accounting data enable us to highlight the

changes and to raise questions about their nature and extent.

2. THE SHARE OF GOVERNMENT IN THE NATIONAL PRODUCT, 1890–1950

A contrast is drawn between government absorption of national product and government expenditure as a whole. A basic table gives the share of government in net national product split into the components

a. Wages and salaries
b. Consumption goods
c. Capital goods

To these components will be added

d. Transfers
   (1) Public debt interest
   (2) Social transfers
   (3) Other transfers
e. Subsidies

and the five components will be expressed individually and in the aggregate as proportions of the net national product at factor cost (we do not have long-run estimates of any other national income aggregate) in order to give some idea of the rate of growth of government expenditure. An attempt will be made to grapple with the problem of real government expenditure.

3. GOVERNMENT EXPENDITURE BY FUNCTION, 1890–1950

The attempt is made to split government expenditure by function, and to relate the classification to the one given above. Here we shall observe the great importance of war-related expenditure, as in the United States, but also we shall be able to see the welfare state in perspective – as a long-run phenomenon, and not as the unique product of the postwar era.

4. CENTRAL AND LOCAL GOVERNMENT EXPENDITURE, 1910–1950

Against the background of intergovernmental fiscal relations, we shall trace the change in the relative importance of central and local government expenditure. This may serve to correct misleading impressions about the growth of government expenditure, because local expenditure is often omitted in general surveys. The importance of capital expenditure at the local level will be borne out.

5. NATIONALIZED INDUSTRIES AND THE NATIONAL PRODUCT, 1938–1950

Nationalized industries will be treated separately because of their anomalous position in government accounts. The main purpose of this section will be to show the share of wages and salaries paid by nationalized industries as a proportion of net national income at factor cost and of personal income, and the share of total gross capital formation controlled by nationalized undertakings.

6. THE LONG-TERM CONSEQUENCES OF THE GROWTH IN THE GOVERNMENT SECTOR

A general discussion of the major problems presented by the growth in the government sector and by its possible continuance will cover such topics as

a. The implied growth in tax burdens and their distribution between layers of government and between different income levels
b. The changing environment of government procurement, e.g. growth of government monopsony and counteracting growth of professional associations
c. The problem of measuring government "efficiency" and attempted solutions found in British discussion

ALAN T. PEACOCK

OTHER STUDIES

The Ownership of Tax-Exempt Securities, 1913–1953, by George E. Lent (Occasional Paper 47) and *A Century and a Half of Federal Expenditures,* by M. Slade Kendrick (Occasional Paper 48) were issued early in 1955. The study of government control over the price of coal, *Minimum Price Fixing in the Bituminous Coal Industry,* by Waldo Fisher and Charles M. James, is in press.

Earl R. Rolph is preparing a report on changes in the public debt in various countries since 1914, and Marshall Robinson is revising his manuscript, "Federal Debt Management: Civil War, World War I, and World War II," which he presented at the meetings of the American Economic Association in

December. An exploratory study of local government finances by Harvey E. Brazer is described in Part Two.

Other studies of governmental economic activity are noted at the end of Sections 1 and 4, and at the beginning of Section 2.

6. *International Economic Relations and Foreign Economies*

STRUCTURE OF WORLD TRADE AND PAYMENTS

Work on a broad study of the flow of goods, services, claims, and money between world areas, made possible by a grant from the Ford Foundation late in 1953, expanded rapidly in 1954. By the end of the year, work was proceeding under my direction along three lines: Cornelius J. Dwyer was conducting a study of petroleum transactions; Herman F. Karreman a study of the world shipping account; and, assisted by Walther P. Michael and Robert M. Lichtenberg, I was preparing matrixes of transactions between world areas from country payments accounts and analyzing the merchandise account in its country-commodity detail.

The year was wound up with a round-table discussion in which the staff joined with leading experts in the field drawn from universities, research organizations, business and banking institutions, agencies of the United States and Canadian governments, and international organizations. A great deal of the work of the staff during the year was pointed toward this conference. Discussion focused on the manifold uses for an integrated, systematic record of the kind being prepared, on the design of the system of accounts, on the problem of securing a proper balance between intensive work on the structure of accounts within a relatively short time period and extensive work with more depth in time, and on some of the special problems of constructing records of petroleum and shipping transactions.

Among the papers considered by the round table was one that had been presented in October to the Conference on Research in Income and Wealth, "On the Elaboration of a System of International Transaction Accounts." It set forth some of the problems encountered in the study and summarized the preliminary findings, which were more fully stated in two other papers giving the trial-run matrixes of merchandise and transport transactions between world areas in 1951. Preparatory papers for the round-table discussion were also written on the special studies of petroleum and shipping transactions and on the problems of compiling a selective record of trade between countries in particular commodities.

As was mentioned in last year's *Annual Report,* some questions raised at a conference on Balance of Payments Presentation held by the International Monetary Fund in September 1953 led to the preparation of a paper on the reporting of regional sectors in payments accounts. This paper was completed and forwarded to the IMF early in 1954. In the course of the year plans were laid with members of the IMF staff to develop a series of informal memoranda on a number of the accounting problems met with in constructing the trial-run matrix, looking toward the formulation of recommendations for modifying the *Balance of Payments Manual* in specific ways.

The compilation of a trial-run matrix of transactions for 1951 has proceeded through all the goods and services accounts: merchandise, transportation, travel, investment income, government services, and miscellaneous services. The following table shows the distribution of current receipts and payments in 1951 by all countries covered, in their transactions with all areas, as found in our trial runs (figures exclude gold and donations).

TABLE 6

A PRELIMINARY TABULATION OF CURRENT TRANSACTIONS OF THE WORLD IN 1951

	Receipts	*Payments*	*Difference*	*Relative Difference*[a]
	(millions of dollars)			
All goods and services	$92,845[b]	$93,349	$ −504	−0.5
Merchandise[c]	76,167	74,463	1,704	2.3
Transportation	5,306	7,873	−2,567	−39.0
Travel	2,258	2,405	−147	−0.6
Investment income	4,270	4,072	198	4.7
Government[c]	1,364	2,286	−922	−50.5
Miscellaneous	3,480[b]	2,250	1,230	42.9

[a] As a percentage of average receipts and payments.
[b] Including $739 million of *net* receipts by the United Kingdom.
[c] Excluding military grants but including United States military expenditures.

Conceptually, of course, payments by all countries should equal receipts by all. That totals of all goods and service transactions differing by only one-half of 1 per cent can be built up from country records on both sides is encouraging. It is a tribute to the careful work being done on payments accounting by central banks, finance ministries, and statistical bureaus all over the world. It suggests that problems of coverage are relatively minor.

However, this close agreement is not wholly to be trusted. It is known that about $1 billion of merchandise payments and a like amount of receipts are omitted from the totals; that transactions of certain important fleets (the United Kingdom tanker fleets and ships registered in Panama, Honduras, and Liberia) accounting for something like $1.5 billion of receipts from shipping are not covered; that receipts of the United States and United Kingdom on account of marine insurance transactions, of the order of $0.5 billion, are omitted; and that there are some other omissions of a like order (hundreds of millions). It is clear that when allowance can be made for known omissions, the totals of payments and receipts in 1951 by all countries with all areas will be greater than as shown above and may diverge more.

The tendency, evident in the figures above, for differences to cancel out when the several account lines are combined indicates the possibility, identifiable in some cases, that countries on one side of a transaction may treat it in one account line (e.g. investment income) and partners may treat it in another (e.g. miscellaneous). Thus it is known that the large investment income from abroad of United Kingdom petroleum and insurance companies is in the British miscellaneous account rather than in the investment account, and sizable merchandise imports by Pakistan are counted as government payments.

We are thus led to feel that the trial-run matrixes can be substantially improved as to coverage and consistency by special work at different points (e.g. shipping and petroleum transactions) and that it will be possible to prepare an adjusted set of accounts for 1951 which will exhibit considerably less divergence in over-all totals, line by line, than the trial-run matrixes.

A paper on the trial-run matrix of merchandise transactions was distributed widely to experts in fifty-two governments around the world, and some useful comments have been received. Experience gained by the staff members concerned with this phase of the work indicates the feasibility of completing the trial-run matrix for 1951, the desirability of incorporating an analysis of the matrix accounts in a formal document, and the possibility of circulating a publishable draft for review by the middle of 1955. By the end of 1955 it may also be possible to prepare trial-run matrixes for the years 1950, 1952, and 1953.

A good deal of effort has been invested, during 1954, in setting up a selective compila-

tion of trade between countries in particular commodities. Such a record would provide the basis for analyzing the commodity composition of merchandise transactions and linking the accounts of transactions to the physical flow of goods and to their prices. It is also thought that the record will provide a basis for preparing transaction accounts for the petroleum and shipping studies. The major cost obstacle to the compilation of the record lies in the problem of recasting country trade records into a common format defining commodity classes. We have been trying to employ the Standard International Trade Classification of the United Nations. At the end of 1954 the first results from the compilation encompassing exports of all countries in 1951 were becoming available, and an analysis was begun of this record and of data for 1951 published by the United Nations in *Commodity Trade Statistics* (CTS).

The preparation of the commodity-country record to be used in the analysis of the merchandise account has been approached on a somewhat more elaborate scale at the outset than it is thought can be repeated for other years. It was felt, however, that for the first year a more extensive compilation should be made in order to provide a basis for designing the more selective record to be secured for other periods. Difficulties encountered so far indicate that both depth in time and depth in detail will need to be curtailed.

An analysis of the commodity trade statistics supplied by the United Nations to determine whether a satisfactory coverage of world commodity trade would be feasible, given our resources, led to some interesting findings. It was learned that the concentration of value of commodity trade between countries is so high that coverage of 88 per cent of the reported total value of exports of CTS countries (i.e. NATO-OEEC countries except Switzerland, Italy, Greece, Iceland) can be obtained by selecting only one-sixth of the country-commodity entries – those of $1 million or over – reported by these countries. On the import side a cutoff set at $1 million provides coverage of 93 per cent of the reported total trade of the CTS countries and requires only a slightly higher fraction of the entries than the one-sixth required on the export side. Thus not only are the commodity imports of CTS countries of considerably higher average value than their commodity exports, but, as shows clearly in Lorenz curves, there is a higher *degree* of concentration for country-commodity trades on the import side than on the export side.

The analysis of divergence between records of trade between countries, mentioned in last year's report, has been held short of completion pending the development of the country-commodity record, because examination of the divergences at the commodity level seems the most promising direction for the work to take.

Thus Dwyer's investigation into the records of trade between countries in petroleum products in 1951, by quantity, indicates that it is possible to secure a remarkable closeness of agreement in total trade recorded by buyers and suppliers in the Western Hemisphere and Europe, and an agreement to within rather small margins for trades between areas. Evidently the difficulties of recording destination and origin, which seem to contribute a good deal to the divergence in records of common trades between country pairs, tend to cancel out when countries are combined in appropriate areas.

Reports by Dwyer and Karreman on their special studies follow.

HERBERT B. WOOLLEY

Petroleum Transactions

The preliminary stages of the study are almost completed and the task of analyzing the 1951 trade figures, taken from original country sources, will soon be under way. Some observations based upon our initial explorations may be made.

Investment Income. The available data on oil company investments abroad and the earnings resulting therefrom indicate that it will be difficult to make consistent valuations of the total of oil company investments in differ-

ent areas, but that it will be much easier to determine the year-by-year flow of investment. Preliminary over-all estimates of earnings compiled from company reports agree closely with Department of Commerce figures; from the company reports it will be possible to allocate the over-all figures by countries and by regions.

Methods of Handling Petroleum in the Balance of Payments. Since different countries handle the petroleum account in their balance of payments in different ways, it will be necessary to decide upon a consistent method of treating this account (and related accounts) for all countries. A discussion of several different techniques has been prepared and will be circulated for comment.

Preliminary Trade Matrix. As part of a preliminary review of petroleum trade statistics, an examination was made of volume data on petroleum imports and exports in 1951 contained in the Bureau of Mines publication *International Petroleum Trade* for thirty foreign countries and in census records for the United States.

The total volume of the transactions, as reported by the importers, was 74,962,000 metric tons, which was 0.4 per cent lower than the exporters' record of 75,257,000 tons. The average of the two records is roughly 75 million tons, which is about one-quarter of the estimated total of world trade in petroleum in 1951. The compilation of data from original country sources, which is now going on, should give us coverage from at least one side of practically all of world *commercial* trade in petroleum. However, since most of the important Middle East oil-exporting countries publish no regional breakdown of their exports, no very large addition to the total of trade covered from both sides can be expected. Nevertheless, the closeness of agreement in this preliminary study of a major portion of that trade provides grounds for confidence in the belief that the one-sided records can be adjusted to a reasonable degree of accuracy.

Needless to say, the over-all divergence of 0.4 per cent conceals much greater regional and country divergences. Analysis of these divergences provides many explanatory clues. For example, it seems very likely that most European countries underreported imports of residual fuel oil, marine diesel, and aviation gasoline intended for bunkering of foreign flag vessels by the international oil companies, with payment in dollars or sterling to the headquarters of those companies. This hypothesis was checked by deducting all movements of residual fuel oil – the most important bunker fuel – from both sides of the import column for fifteen European and North African countries. In the original record, these countries reported receiving 12 per cent less than the exporting countries reported sending to them. After adjustment, the divergence was only 5 per cent. This adjustment also changed the divergence in the totals: from — 0.4 per cent (importers' records that much lower than exporters' records) to + 0.9 per cent (importers' records that much higher).

CORNELIUS J. DWYER

Transportation and Marine Insurance

The detailed work of reconstructing and filling out the world's account of transactions for transportation is still in an exploratory phase. Tentatively, we plan to start with a record of the physical movement of goods between countries and apply freight rates to the different movements. This would give the freight amounts paid by each country for the transportation of its imported merchandise (and the freight amounts entering into c.i.f. values of goods imported). These payments would then be distributed over the various earning countries according to their participation in the movement of the goods, in order to derive figures on the receipts, country by country, from sale of transportation services. In the same way, amounts paid and received on account of passenger fares, port disbursements abroad, and insurance on commodities entering international trade could be assessed.

A full computation of the amounts involved will, however, require the compilation of a great deal of detailed information: figures on

the quantities of all the goods moved between particular countries, freight rates on these movements, the shares that ships of different fleets had in carrying the goods, etc. But since most of the requirements for ship services are accounted for by only a few commodities and since only a few countries have sizable fleets, it may be possible, by a process of careful selection, to reduce the amount of data and the calculations to manageable proportions and at the same time develop estimates reasonably accurate for adjusting the countries' transportation accounts.

It is thought that this approach will at the same time reveal the basic factors underlying the employment of the world's fleet in the movement of goods and permit an economic analysis of the shipping and insurance activities of the countries which are most important in these fields.

HERMAN F. KARREMAN

CYCLES IN FOREIGN TRADE

Our main project, the analysis of export and import cycles since 1880, must await the new foreign trade series for the period from 1880 to 1923 which are being compiled (see Robert E. Lipsey's report below). In the meantime we brought into the required shape the relevant Department of Commerce series (which cover the period since 1923) and analyzed comparable British series.

One fact that comes out clearly even at this preliminary stage is the close dependence of American exports on the state of world trade. Expansion of our exports, for instance, can be expected only when total world trade is on the rise. This has obvious implications for economic policy. From the business cycle point of view it means that one of the few activities which seems unrelated to business cycles has a highly regular cyclical pattern when viewed against world instead of domestic cycles.

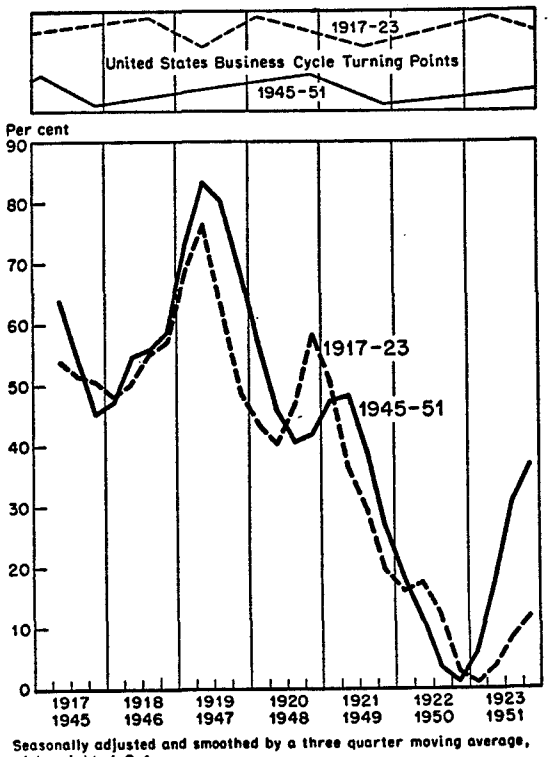
A special study deals with the trade balance, the difference between the values of merchandise exports and imports. Such an investigation seemed indicated since, strange though it may seem, the actual behavior of the United States trade balance in business cycles is not generally known despite its recognized role in the international transmission of cycles.

One of the most interesting findings of this study is the remarkable stability of the cyclical pattern of the United States trade balance over time. For fifty years, from 1880 to 1930, the relationship between balance movements and world and domestic business cycles conformed to the same rules. For instance, the balance declined on the six occasions when an American business expansion coincided with a contraction in world trade and rose in ten of eleven occasions when domestic contraction was accompanied by world trade expansion. Further, *rising* world trade was regularly associated with a *falling* trade balance when an American business expansion was in its last year and, conversely, the balance rose in the face of shrinking world trade at the beginning of domestic contractions. These patterns were interrupted by the Great Depression and by World War II and its aftermath, but they now seem to be re-establishing themselves despite the tremendous changes that have affected world trade over three-quarters of a century. For example, in 1953–1954, when the American economy experienced a mild business contraction in the face of an expansion in world trade, the balance rose; in 1952–1953, when the opposite conditions prevailed, the balance fell. Theories which maintain that balances of industrial countries react differently to business cycles than balances of non-industrial countries or that creditor and debtor countries' balances have opposite cycle patterns will have to be re-examined in the light of these findings.

The most striking repetition of movements in the trade balance is perhaps that which took place when the "normal" pattern of change was interrupted in the years of readjustment after the world wars. Chart 11 shows that – in contrast to all the recent emphasis on "structural changes" – the American trade

CHART 11

The United States Trade Balance after Two World Wars, 1917–1923, 1945–1951, Export Surplus as Percentage of Average Exports



Seasonally adjusted and smoothed by a three quarter moving average, with weights 1, 2, 1.

balance behaved under the impact of World War II almost exactly as after World War I. The extraordinary flow of American goods which went to fill the gaps torn by the war reached its crest later this time than after the first war, in 1947 as against 1919. But the tempo and extent of the subsequent steep decline of the balance reflecting the restoration of more normal conditions abroad was almost exactly the same in both cases. The general business recession that set in, in each case, about one year after the export surplus had reached its peak caused a brief but characteristic rise in the balance, interrupting the downward movements in 1920 and 1948. After the postwar readjustment period the balance in the 1920's returned to its normal cyclical pattern, and the same seems to hold for the 1950's.

ILSE MINTZ

INDEXES OF AMERICAN FOREIGN TRADE

We have completed the calculation of quarterly and annual price, volume, and value indexes covering the years 1879 to 1923 for total United States exports, five major economic classes, and more than forty minor commodity groups.

The only previously published series on United States export prices with which we can compare ours is an annual one for 1879 to 1916 compiled by T. J. Kreps (*Quarterly Journal of Economics,* August 1926). The general appearance of the two indexes is similar, both showing the long decline of prices until the late 1890's and the steady rise in the following years up to World War I. But Kreps' series fluctuates more sharply than ours and reaches a lower trough in the 1890's, mainly because it is heavily weighted with crude products, particularly raw cotton.

As we should expect, our price index for crude materials fluctuates more violently than that for manufactured products. But the trends are very different too, particularly between 1898 and 1913, when crude material prices more than doubled while prices of manufactured goods (excluding foods) rose by less than 30 per cent.

We expect to complete shortly a memorandum on food and tobacco exports, which accounted for more than 50 per cent of total exports at the beginning of our period and never fell below 20 per cent. It will describe the importance of these items in the export total, the shifts in the composition of the group, and the growth in the quantity. We shall also attempt to analyze differences between export and domestic food price movements, and to estimate the margins of error surrounding our estimates.

On the import side, we have completed the collection of annual data for crude and manufactured foodstuffs and textile products, and started work on the assembling of annual data for other commodity groups and on the quarterly figures.

ROBERT E. LIPSEY

ECONOMIC GROWTH OF THE SOVIET UNION

The National Bureau has undertaken, over the years, many studies of economic growth – in labor, capital, and output. Last year we began a new study in this field, under a grant from the Rockefeller Foundation. Our purpose is to set forth and analyze the evidence bearing on the question: How rapidly has the Soviet economy been growing in the past thirty years?

The study, while making full use of the detailed statistical work done in this country and abroad during the last decade on different sectors of the Soviet economy, will be based mainly upon data from primary sources. It faces at least three difficulties. The first of these is not peculiar to Soviet material but is present in any attempt to measure the economic growth of an economy in which methods of production and character of output are undergoing alteration. The second difficulty is the absence since the middle 1930's of systematically arranged statistical data – statistical yearbooks, reports, and similar sources – such as are usually available for the analysis of other economies. This makes it necessary to build up piece by piece the time series of production, resource input, and similar magnitudes needed for the measurement of economic growth, from scraps of quantitative or qualitative information in a vast array of sources. The third difficulty is the uncertain reliability of even the scattered data available from Soviet sources. The nature of the materials calls for constant vigilance in their use and makes a careful scrutiny of the figures, a check for internal consistency and comparability, and an assessment of their reliability a major task of the study.

In accordance with these general objectives we are investigating each of several sectors in terms of which a picture of economic development in the Soviet Union might be built up. In the industrial production sector, which is being studied by G. Warren Nutter, Alexander Erlich, Israel Borenstein, and others, the major objective of work during 1954 has been the assembly of output series covering, insofar as possible, the entire Soviet period. A number of such series, including various industrial materials, chemicals, construction materials, machinery, and consumer goods, have been compiled. In utilizing these data, one of the most serious difficulties is how to distinguish growth from mere change in industrial structure. This problem is perhaps most acute for the period 1928–1932 (the first Five Year Plan), but it is undoubtedly important for other periods as well. It arises in the earlier period as a result of the shift from so-called "small-scale" to "large-scale" industry, a shift not fully revealed – and, indeed, frequently hidden – in Soviet statistics, which are typically restricted to large-scale industry. If this structural change is not carefully analyzed and treated as something different from growth, a marked upward bias is imputed to estimates of growth.

In the agricultural sector, work under the direction of George Kuznets has thus far centered largely on the gathering and checking of physical-output data for crops and livestock and of data on the input of various factors. The compilation and preliminary examination of output data for individual crops and livestock products and of sown area for crops has been substantially completed for the period to 1940. The readily available data for the more recent period beginning with 1945 have also been gathered, and a systematic sifting of the more obvious sources of data for current years is in progress. As an aid in appraising the published data, a detailed review of changes in the methods of data collection in Soviet agriculture, with particular reference to yield estimation, was carried out.

The study of the transportation sector, under the direction of Ernest W. Williams, Jr., is designed largely, though not entirely, to provide a check upon other evidence of Soviet economic growth, particularly through the use of traffic data. Relatively, a wealth of more or less reliable data is available concerning Soviet railroad transportation, with much less information for the other and less important forms of transport. A primary task has been to evaluate the traffic and plant data and to gain an understanding of the operations of the rail-

way system. Later phases of the study will explore the possibilities of complementing these data with salient measures for other forms of transportation and of comparing broad classes of commodity traffic with production data.

In addition to the studies of industry, agriculture, and transportation, attention is also being paid to changes in population and labor force, housing and community facilities, and other matters. Among those participating in the project, in addition to those mentioned above, are Raymond W. Goldsmith, Leo Grebler, Ruth P. Mack, and Harold Wool, as well as Adam Kaufman and Philip R. Lever.

OTHER STUDIES

Immigration and the Foreign Born, by Simon Kuznets and Ernest Rubin (Occasional Paper 46) was published in December.

Penelope Thunberg's memorandum on "The Canadian Balance of Payments, 1868–1952" is being circulated for comment. Gideon Rosenbluth's report on "Industrial Concentration in Canada" is undergoing revision.

A report on studies of governmental economic activity in several countries is given in Section 5. Other studies are mentioned at the end of Sections 1 and 5. Some of the papers presented at recent conferences deal with international economic relations and foreign economies – in particular, the conferences on Capital Formation and Economic Growth, Measurement and Behavior of Unemployment, and Comparability of National Accounts. A conference on Consumption and Economic Development, to be held in 1955, will deal in part with consumption in underdeveloped areas and with international comparisons of consumption. A conference on international trade is being planned for 1956 (see Part Two).

National Bureau Publications

Instructions for ordering publications on page 78.

BOOKS

GENERAL SERIES

*1 *Income in the United States: Its Amount and Distribution, 1909–1919. I, Summary*
Wesley C. Mitchell, Willford I. King, Frederick R. Macaulay, and Oswald W. Knauth
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*2 *Income in the United States: Its Amount and Distribution, 1909–1919. II, Detailed Report*
Wesley C. Mitchell (ed.), Willford I. King, Frederick R. Macaulay, and Oswald W. Knauth
1922, 454 pp.

*3 *Distribution of Income by States in 1919*
Oswald W. Knauth 1922, 2nd ed., 36 pp.

*4 *Business Cycles and Unemployment*
Committee of the President's Conference on Unemployment, and a Special Staff of the National Bureau 1923, 448 pp.

*5 *Employment, Hours and Earnings in Prosperity and Depression, United States, 1920–1922*
Willford Isbell King 1923, 2nd ed., 150 pp.

*6 *The Growth of American Trade Unions, 1880–1923*
Leo Wolman 1924, 170 pp.

7 *Income in the Various States: Its Sources and Distribution, 1919, 1920, and 1921*
Maurice Leven 1925, 306 pp., $3.50

*8 *Business Annals*
Willard Long Thorp 1926, 382 pp.

9 *Migration and Business Cycles*
Harry Jerome 1926, 258 pp., $2.50

10 *Business Cycles: The Problem and Its Setting*
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Wesley C. Mitchell 1927, 514 pp., $5.00

*11 *The Behavior of Prices*
Frederick C. Mills 1927, 598 pp.

12 *Trends in Philanthropy: A Study in a Typical American City*
Willford Isbell King 1928, 78 pp., $1.00

*13 *Recent Economic Changes in the United States*
Committee on Recent Economic Changes of the President's Conference on Unemployment, and a Special Staff of the National Bureau
1929, 2 vols., 990 pp.

*14 *International Migrations. I, Statistics*
Imre Ferenczi (compiled on behalf of the International Labour Office, Walter F. Willcox, ed.) 1929, 1112 pp.

*15 *The National Income and Its Purchasing Power*
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Pierce Williams and Frederick E. Croxton
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Leo Wolman 1930, 292 pp.

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Frederick R. Macaulay 1931, 174 pp.

20 *The Purchase of Medical Care through Fixed Periodic Payment*
Pierce Williams 1932, 326 pp., $3.00

*21 *Economic Tendencies in the United States: Aspects of Pre-War and Post-War Changes*
Frederick C. Mills 1932, 666 pp.

22 *Seasonal Variations in Industry and Trade*
Simon Kuznets 1933, 480 pp., $4.00

†23 *Production Trends in the United States since 1870*
Arthur F. Burns 1934, 396 pp., $4.00

†24 *Strategic Factors in Business Cycles*
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25 *German Business Cycles, 1924–1933*
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*32 *National Income and Capital Formation, 1919–1935*
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33 *Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*
Frederick R. Macaulay 1938, 612 pp., $5.00

The Social Sciences and the Unknown Future, a reprint of the introductory chapter of Mr. Macaulay's volume. 25¢

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* Out of print.

† Available from Kelley and Millman, Inc., 80 E. 11th St., New York 3, N.Y.

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*39 *The Output of Manufacturing Industries, 1899–1937*
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*43 *The Mining Industries, 1899–1939: A Study of Output, Employment and Productivity*
Harold Barger and Sam H. Schurr 1944, 474 pp.

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2 *Measuring Business Cycles*
Arthur F. Burns and Wesley C. Mitchell 1946, 7½ x 12, 592 pp., $5.00

3 *American Transportation in Prosperity and Depression*
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4 *Inventories and Business Cycles, with Special Reference to Manufacturers' Inventories*
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3 *Economic Research and the Development of Economic Science and Public Policy*
Twelve papers presented at the Twenty-Fifth Anniversary Meeting of the National Bureau of Economic Research 1946, 208 pp., $1.00

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Exploratory Committee on Research in Securities Markets 1946, 34 pp., 50¢

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Exploratory Committee on Research in the Capital and Securities Markets 1954, 88 pp., $1.00

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*3 Seven papers on income size distribution, savings, national product, and distribution of income by states 1939, 508 pp.

*4 *Outlay and Income in the United States, 1921–1938*
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*5 *Income Size Distributions in the United States, Part I*
1943, 160 pp.

*6 Seven papers examining income measurement in relation to government product, income parity for agriculture, international transactions, forecasting national income, and income differences among communities, and dealing with the adequacy of income estimates for computing net capital formation 1943, 302 pp.

*7 *Changes in Income Distribution during the Great Depression*
Horst Mendershausen 1946, 192 pp.

*8 Eleven papers primarily concerned with estimates of national income of the United States and of foreign countries for use in dealing with war problems and postwar adjustments
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9 *Analysis of Wisconsin Income*
Frank A. Hanna, Joseph A. Pechman, Sidney M. Lerner 1948, 284 pp., $3.50

10 Eight papers on standardizing basic concepts of national bookkeeping by American, British, and Canadian statisticians; problems of international comparisons of income and wealth; the nation's economic budget and forecasting gross national product and employment; savings and income distribution, and resource distribution patterns
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11 Six papers on the industrial distribution of manpower, real incomes in dissimilar geographic areas, national income forecasting, and the saving-income ratio 1949, 464 pp., $6.00

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