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I THE STAFF

Several members of the staff have resumed their research work, after long service in the military or civil branches of the government. David Durand, a Lieutenant in the U. S. Naval Reserve and stationed in the Pacific during a good part of the war, returned to the financial research staff in November 1945. Harry Eisenpress, a Master Sergeant during the war, was released from the Army in February 1946, and is now assisting Clarence Long in his study of unemployment. W. Braddock Hickman, after three years as Lieutenant in the U. S. Naval Reserve, returned to the financial research staff in February 1946. During the war he was stationed at U. S. Naval Proving Ground, Dahlgren, Virginia. Augustus Kelley, a Captain in the Medical Corps during the war, was released from the Army in the autumn and has returned to his work in the Business Cycle Unit. Solomon Fabricant returned to the staff in February 1945, after serving with the War Production Board and with UNRRA in London. Dan T. Smith was released in the autumn of 1945 from his war duties at the Graduate School of Business Administration, Harvard University, and has resumed work on the study comparing definitions of business income for tax purposes and for business purposes.

A leave of absence has been granted Simon Kuznets for the summer of 1946, to enable him to assist the government of China in developing statistical data bearing on the industrialization program of that country.

II PUBLICATIONS

During 1945 the National Bureau published the following books: *Corporate Cash Balances, 1914-43*, by Friedrich A. Lutz; *The Pattern of Corporate Financial Structure*, by Walter

A. Chudson; *National Product in Wartime*, by Simon Kuznets; *Income from Independent Professional Practice*, by Milton Friedman and Simon Kuznets. Also, three *Occasional Papers* were published, viz., *The Federal Reserve System in Wartime*, by Anna Youngman; *Bank Liquidity and the War*, by Charles R. Whittlesey; and *Labor Savings in American Industry, 1899-1939*, by Solomon Fabricant.

At the end of the year four volumes were in press: *Measuring Business Cycles*, by Arthur F. Burns and Wesley C. Mitchell; *Changes in Income Distribution during the Great Depression*, by Horst Mendershausen; *Studies in Income and Wealth, Volume VIII*, by the Conference on Research in Income and Wealth; *National Product since 1869*, by Simon Kuznets.

In addition to the books in press, the following reports have been approved by the Directors and are being prepared for printing: *Value of Commodity Output since 1869*, by William H. Shaw; *National Income: A Summary of Findings*, by Simon Kuznets; *Price-Quantity Interactions in Business Cycles*, by Frederick C. Mills; *Business Finance and Banking*, by Raymond J. Saulnier and Neil H. Jacoby; also *Domestic Servants in the United States, 1900-40*, an *Occasional Paper* by George J. Stigler.

The individual staff reports list other studies that may eventuate in publications during 1946.

III REPORTS BY RESEARCH STAFF

Production and Productivity

Occasional Paper 23, by Solomon Fabricant, was published in November. This paper traces labor savings in American industry from 1899 to 1939. Early in 1946 Mr. Fabricant expects to complete the manuscript of another paper, describing changes in the relation between labor and product since 1939. This will supplement *Occasional Paper 23* and *Occasional Paper 7*. George Stigler has in an advanced stage of preparation a brief essay summarizing and appraising the National Bureau's studies on output, employment, and productivity.

Progress is also being made on the industry monographs, as the staff reports indicate.

SERVICE INDUSTRIES

During 1945 I began two related investigations, which will continue into 1946. One is a general survey of trends in employment in that group of heterogeneous industries sometimes called the service industries—trade, finance, government, as well as personal and business services. The study aims to describe these trends and to indicate the general factors bearing on them. It is to serve as an introduction to detailed studies of selected individual industries. In the second investigation which I began in 1945, I hope to make a detailed study of government employment (excluding education). Additional detailed studies are being carried on by George Stigler.

SOLOMON FABRICANT

During the past year I revised the manuscript on domestic service, which has been approved for publication as an *Occasional Paper*. Work is continuing on employment in education since 1900. It has been found expedient to deal separately with elementary and secondary education, on the one hand, and higher education, on the other. The first and preponderant field has approached its peak in employment, whereas higher education—as every teacher now facing a battalion of veterans vividly appreciates—is still a rapidly growing industry. A systematic analysis of employment in education has many interesting facets; for example, do compulsory education laws merely reflect current attitudes or do they significantly affect school enrollments? A draft of the essay on education will be completed this year. The essay on wholesale and retail trade is, for the time being, in abeyance.

GEORGE J. STIGLER

ELECTRIC AND GAS UTILITIES

A manuscript on *Productivity Trends in the Electric and Gas Utilities, 1899-1942* will soon be submitted to the Directors. In addition to presenting new indexes of output, employment,

and output per worker in the electric, manufactured gas and natural gas utilities, the study seeks to examine the secular relation of output to the use of resources other than labor; that is, materials, fuel, and capital. For the rest, the report traces the movement of electric and gas output since the turn of the century, emphasizing the special character of these industries as public utilities. For instance, the measurement of output presented several technical problems not encountered in preceding reports in this series. Among them is the use made of utility rates for various consumer groups as price weights in the construction of output indexes, although these rates are not the product of the ordinary market mechanism.

In the analysis of trends, reliance is placed on the logarithmic parabola to reveal evidences of retardation (or acceleration) of growth. The application of growth-curve analysis to indexes of output per worker in the public utilities, and in such other sectors of the economy as manufacturing, agriculture, and mining, indicates on the whole a notable absence of retardation, contrary to the typical pattern of the output indexes themselves.

JACOB M. GOULD.

TRANSPORTATION INDUSTRIES

Since returning from overseas I have reviewed the completed portions of my manuscript dealing with output and employment in the transportation industries. I hope shortly to be released from wartime service, and plan to finish the study as rapidly as possible.

HAROLD BARGER

Business Cycles

Some of the work on business cycles which was interrupted by the war is now being resumed. Geoffrey Moore has returned to his study of agricultural cycles, and expects to prepare a preliminary draft of a manuscript during 1946. Millard Hastay, formerly of Stanford University and the Statistical Research Group of Columbia University, has joined the Business Cycle Unit, and for the present will assist Mr. Moore in supervising our statistical operations. We expect that Moses Abramovitz

will rejoin the staff in the spring, spend a few months in revising his study of the cyclical behavior of manufacturers' stocks, then turn to other tasks.

Wesley Mitchell expects to complete this year his substantial essay, *What Happens during Business Cycles: A Progress Report*. Now that *Measuring Business Cycles* is out of the way, A. F. Burns has returned to the study of investment, and expects to prepare during the year a paper on *Construction Work and Business Cycles*. Both this paper and Mr. Mitchell's report will be published in the Twenty-fifth Anniversary Series. As a byproduct of our work on banking, Anna Jacobson Schwartz and Elma Oliver have prepared a *Technical Paper* giving monthly estimates of currency in public circulation since 1914. This paper has been submitted to the Directors.

Information on other parts of the work in Business Cycles is presented in the sections on Labor and Prices, as well as in the staff reports that immediately follow.

ANALYSIS OF TIME SERIES

During the first part of the year the revision of reference-cycle analysis of the monthly and quarterly series for the United States was virtually completed, and in the fall the computing staff began a series of tabulations of these measures for Mr. Mitchell. The tabulations cover 794 series, arranged by industrial and other groups, and so far have pertained to average rates of change in economic activities from stage to stage of business cycles, rates of acceleration and retardation, cyclical timing, and indexes of conformity.

The development of automatic computing mechanisms during the war suggests that some of our more routine operations might be mechanized; for example, (1) computation of ratios of original data to twelve-month moving averages, (2) application of seasonal indexes to original data, (3) charting of original and seasonally adjusted data, (4) computation of reference-cycle and specific-cycle patterns and derivative measures. With the expert advice of George R. Stibitz of the University of Vermont, we have begun to investigate the possibility of adapting or building a machine to do these jobs.

Among the new series constructed for the United States are an index of production of manufactured food products, monthly, 1919-22, to supplement the Federal Reserve Board index, which is less comprehensive in those years; an index of factory employment, building materials, monthly, 1919-42; value of total construction contracts, monthly, 1919-38, this being a reweighting of the F. W. Dodge series; and an index of railway equipment orders (locomotives, passenger cars, and freight cars), quarterly, 1870-1942.

GEOFFREY H. MOORE

TRANSPORTATION AND COMMUNICATION

Work on transportation cycles during 1945 consisted chiefly of amplifying and checking the graphic and tabular material for the United States monograph, and of rounding out and revising the text.

A sketch of the final plan of the book may be appropriate here. *American Transportation in Prosperity and Depression* begins with three chapters on the relations between cycles in the economy at large and those in railroad traffic. Five chapters are then devoted to relations between the traffic cycles and the utilization of equipment, labor, and fuel in the industry. Among other things, they provide information on physical factors in costs. Price and wage factors are discussed in the next chapter. The tenth deals directly with costs and profits. Chapter 11 sets forth what little we know about cycles in nonrail transport. A final chapter outlines some probable features of future cycles; in effect it thereby summarizes the study. The monograph will soon be submitted for staff review.

Some of the more important results have been indicated in preceding annual reports; I will not repeat them. The study illustrates the differences in the severity with which depression afflicts various parts of the economy. On the railways, travel tends to have milder fluctuations than the movement of goods. Patronage of urban transit facilities is not very sensitive to business disturbances. Nor, to judge from gasoline consumption, is use of the highways. Inland waterway traffic, composed largely of iron ore on the Great Lakes, is more variable than

coastwise traffic, composed largely of oil. Our data show the contrast between the steadiness of supervisory jobs and the fluctuations in other employment. Surprisingly, perhaps, variations in maintenance man-hours, like those in man-hours in general, are not greater than in traffic.

Cycles in the railway industry up to about 1920 differ in an important respect from later developments. Before that year the growth of both freight and passenger traffic during expansions usually exceeded the losses during contractions by a wide margin. In later years each peak was only a little higher than, or not as high as, its predecessor. Employment, too, failed to reach previous levels. In consequence, the railroads could rely to a greater degree than before on reserves of experienced labor in such expansions as did occur. The change in trend was reflected also in stocks of cars and locomotives; a long steady rise in the first era was succeeded by a persistent long decline in the second.

We worked up some new material on the number of hours freight cars and locomotives are in use each month. Variations in useful hours turn out to be more important than those in average carloads and trainloads in their effect on the amount of traffic handled per unit of equipment.

Stocks of vehicles are poorly or inversely related to the volume of traffic in the relatively short run of a cycle. They have often grown in both its rising and declining phase, sometimes more rapidly in the latter; or diminished in both, but less rapidly in the declining phase. Orders for the construction of freight and passenger cars, to be sure, average higher per quarter in expansions than in contractions of ton-miles and passenger-miles, respectively. But delays in delivery and poor conformity of retirements apparently prevent the difference in orders from being reflected in the rate of net change in stocks. Within an expansion there seems to be little relation between changes in the rate of traffic growth and in the rate of ordering.

We have supplemented our study of costs with one of taxes paid by railways. On the whole they conform to traffic but are not as variable. Taxes on property are least sensitive to busi-

ness conditions, those on profits most. Payroll taxes, when the rates stabilize, will occupy an intermediate position.

To our analysis of operating profits we have added a discussion of corporate profits (after interest, etc.). They are extremely variable in the aggregate and per unit of business done. The rate of return on net worth also rises and falls with traffic. Dividend payments are more stable than corporate earnings.

I plan to spend 1946 chiefly in writing up our data on cycles in European transportation. The communications industry here and abroad will receive some attention.

THOR HULTGREN

CONSUMPTION AND PRODUCTION OF CONSUMER GOODS

Work on *Consumption and Business Cycles, A Case Study: Footwear* is progressing and a manuscript should be ready by fall.

The first chapter analyzes the two phases of the general problem of consumption in business cycles: the pattern of consumer buying and its causes; the impact of changing consumer purchases on the production of consumer goods. What we know and need to know about these questions is discussed, and the function of the case study outlined. The second chapter describes the cyclical patterns of consumer buying of shoes, measured in dollars and in pairs. The third chapter explores the causes of change in consumer takings. An attempt is made to evaluate the part played by changes in income, income distribution, direction of income change, price, and several minor factors. The fourth chapter turns to the problem of how change in consumer demand is passed backward to change in production of shoes, cattle hide leather, and cattle hides. It presents the basic enigma: all these processes seem to reach peaks and troughs at more or less the same time, notwithstanding the rather lengthy interval between the moment when a given hide is removed from the carcass and the shoes made from that hide are trundled home by the final buyer. The next three chapters grope behind the statistics of output to study the process of demand transmission. Each chapter focuses

on a different buyer-seller relation: Chapter 5 deals with the relation between the retailer and the shoe manufacturer or wholesaler, Chapter 6 with the relation between the shoe manufacturer and the tanner, and Chapter 7 with the relation between the tanner and the packer or hide dealer. In each of these chapters the institutional setup for both buyer and seller is described and relevant aspects of management practice discussed. Time series on production, sales, stocks, stock-sales ratios, deliveries, prices, and, wherever possible, new orders, are examined; finally, the process of demand transmission—the way in which changes in a company's sales eventuate in changes in its buying, and the part that stocks and changing prices seem to have played—is described for various stages of a business cycle.

It is interesting to note that at the retail stage cyclical changes in consumer demand and in the stocks required to service it seem to exert a dominant influence on store purchasing, whereas actual or expected change in price plays a relatively minor part. But as we proceed backward through shoe production and tanning toward the market for raw hides, actual and anticipated price change plays an increasingly important role, relative to sales or shipments, in shaping the cyclical pattern of buying.

In the last chapter the various pieces of the story will be put together. Then certain of the major findings will be enumerated in a form in which they could be subjected to inductive examination by recourse to information on other commodities. In some cases it will be necessary merely to state the hypothesis. For example, it would be interesting to know whether other consumer goods display, like shoes, minor waves in consumer buying that correspond more nearly to similar waves in industrial payrolls than in total income payments. For others, it is necessary to specify the variables that would cause our findings for footwear to differ from those that might be expected for other commodities. Thus, we have found that the timing of retailers' purchases of shoes seems to be strongly influenced by changes in the sales-stock ratio. Yet, to state the nature of the relation that one would expect to find between

the sales-stock ratio and the purchasing of some other commodity, it would be necessary to know a good deal about the marketing process in this other field—whether the chief burden of finished stocks is carried by retailer or manufacturer, the average size of retailers' stocks relative to monthly sales, whether the item is 'high style' or 'staple', the amplitude of the usual seasonal fluctuations in sales, something about management and buying practice. Knowing these things, or setting up hypothetical situations embodying a group of alternatives, one could translate the findings for shoes into propositions to be tested in other fields. The chapter will conclude with a few reflections on what the study seems to indicate concerning the practical usefulness of 'multiplier' analysis and related concepts.

A long appendix describes the compilation of our monthly estimates of shoe sales and the average price of shoes, and discusses the reliability of the figures and the problems of deriving analogous data for other consumer goods.

RUTH P. MACK

INCORPORATION OF BUSINESS ENTERPRISES

The manuscript should soon be ready for consideration by the Directors. The chapter headings will convey some notion of its scope and character.

- 1 The Nature of the Study
- 2 The Significance of an Incorporation
- 3 The Period of the Special Charter
- 4 The Trends in Business Incorporations, 1875-1943
- 5 The Number of Incorporations and their Authorized Capital Stock
- 6 Large, Medium, and Small Business Corporations
- 7 An Industrial Classification of Incorporations
- 8 Results of Classifying Incorporations Industrially
- 9 Incorporations and Business Cycles

G. HEBERTON EVANS, JR.
Johns Hopkins University

INTERNATIONAL FINANCIAL TRANSACTIONS

During 1945 the manuscript grew approximately 400 pages and is nearing completion. Many interesting facts and relations have been found and described. But the difficulties of interpretation are great, partly because the facts cannot be established completely, partly because their interrelations are complex.

The chapters on the international solidarity of the money markets and on the behavior of central bank rates have been completed. The number and diversity of the instruments of central bank policy make it difficult to determine whether, in what sense, and to what extent there was international interdependence.

Since the aims of central bank policy imply the protection of a country's gold reserves, and the amount of gold in active circulation determines to a high degree the ease or difficulty with which this policy can be applied, we thought it desirable to go into this matter in detail. We were able to distinguish certain trends in the distribution of the total gold stock between the central banks and the public; and found that the gold in circulation constituted such a large portion of the total gold stock in all countries, as to throw, at least by implication, new light on the workings of a gold standard mechanism.

We have done further work on exchange rates, comparing spot rates with forward and 'arbitrage' rates. These rates, we think, are very sensitive barometers of the strains and stresses of the international system.

Additional work has also been done on the relation between exchange rates and short-term interest rate differentials of leading money markets. By a method we devised some time ago we are able to indicate quantitatively the amount of 'effort' exerted by one market to attract short-term capital from another.

The remaining two or three chapters will deal with gold movements, long-term interest rates, and flotations of foreign loans. Price levels and the foreign trade balance will also be dealt with, though in a subsidiary way. However, it is clear that the interaction of business cycles in different countries can-

not be adequately treated unless study is extended beyond the financial field with which we are dealing.

OSKAR MORGENSTERN

Labor

I propose in 1946 to complete two studies long under way. The first is a preliminary review, to be published in the Twenty-fifth Anniversary Series, of the behavior of wage rates in the United States since 1860. It undertakes to trace the relation between changes in wage rates and in business conditions, as well as the secular behavior of wage rates. Among the questions considered are (a) movements in the level of wages, (b) changes in the wage structure, (c) war and post-war wage changes, and (d) the relation between changes in wages and in prices.

The second study is an account of the rise in the membership of labor unions in the United States since 1935. This investigation, beginning with the organization of the CIO, deals with developments in American organized labor as they were affected by national labor policy, the organizing campaigns of 1936-37, the Wagner Act, and the political and economic influences of World War II.

In January 1946, Clarence Long, formerly of the Institute for Advanced Study, joined the staff of the National Bureau. He will be engaged in completing monthly estimates, begun at the Institute, of the size of the labor force, and the volume of employment and unemployment in the United States since 1914. Among other things, Mr. Long's inquiry will serve as an introduction to the study of unemployment in this country during the last quarter century.

LEO WOLMAN

Prices

During 1945 a manuscript, *Price-Quantity Interactions in Business Cycles*, was submitted to the Directors, after review by a staff committee. It has now been approved for publication and will appear in 1946 as one of the Twenty-fifth Anniversary publications of the National Bureau.