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NATIONAL BUREAU OF ECONOMIC RESEARCH

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To the Board of Directors:

The National Bureau of Economic Research, during the year 1925, completed and published one volume, Income in the Various States, and actively continued its investigations in the fields authorized by the Board of Directors and its Executive Committee. Several studies are nearing completion and will soon be submitted to the directors for their criticism. One has just been presented: Business Annals, compiled by Dr. Thorp with an introduction by Professor Mitchell. This follows, in brief outline, the fluctuations of business year by year in a number of countries as far back as historical data, adequate for continuous yearly description, extend. The volume is a by-product of the study of Business Cycles, which developed sufficient importance and general interest to warrant expansion and separate publication. This volume will be followed promptly by that on Migration and Business Cycles, by Dr. Jerome. The manuscript with tables and charts of this study is complete. It is the first result of the economic investigation entrusted to the National Bureau by the Committees on Human Migration of the National Research Council and the Social Science Research Council. A report on Gradations of Earnings and Income in the United States in 1921 has been made by Dr. King, and, as soon as certain tables have been recomputed, the revised text will probably be submitted to the directors as the third publication in 1926. Two more publications for 1926 are also nearing completion, Professor Mitchell's first volume of a general treatise on Business Cycles, and Dr. Macaulay's analysis and statistical presentation of Bond Yields and Interest Rates in the United States since 1859. A voluminous collection

of statistical material for use in the analysis of business cycles has been made by Dr. Thorp, assisted by Mr. Harold G. Villard and Mrs. Thorp. No such collection of monthly series has ever before been brought together, and a special effort must be made to secure the funds necessary to publish this bulky and expensive work as an extra volume. The material here gathered for the United States, England, France, and Germany should be made accessible to other workers in the same field, and indeed to statisticians and economists generally.

This array of publications due to appear in 1926 will make some amends to those who have steadily and hopefully supported the work of the National Bureau of Economic Research. It will also call for the cooperation of the directors whose labor in reading will be lightened, so far as possible, by the preparation and submission, together with the complete manuscripts, of full summaries of text and descriptive lists of tables and charts.

The various lines of investigation which have been and are now pursued in the Bureau are here briefly set forth.

I. Income in the United States.

During 1925 Dr. Willford I. King and his assistants prepared a study of Transportation Trends which was submitted to the directors and failed to secure the requisite approval. He also prepared the "Preliminary Statement" for the volume entitled Income in the Various States, which shows the industrial classification of the gainfully occupied, indices of the prices of consumption goods, and the chief items in the income of the people of the United States in the years 1919, 1920 and 1921. These last-mentioned totals are those used by Mr. Leven as a basis for the distribution of income by states which forms the chief matter in this book. Since there has

been considerable demand for a continuation of the National Bureau's study of the distribution of individual incomes ^{by income} classes, one corporation even volunteering a contribution of \$1,000 toward the expense of such an estimate, Dr. King was asked by the Executive Committee to undertake the task of making this distribution for the year 1921. It also seemed advisable, in response to numerous requests, to see what could be done to estimate the distribution of wealth at the close of 1921. When the work had been completed, it became apparent, as the directors of research had feared, that the data for the latter problem, that of wealth, were inadequate, even with the most patient handling, to satisfy the scientific standards of the National Bureau. The estimates of income, however, despite the fluctuating unreliability of the income-tax returns, appeared sufficiently close to the mark to warrant continued work. These figures, carefully revised with the cooperation of Dr. Macaulay and Dr. Mills, will, in the near future, as stated above, be submitted to the directors.

The fundamental work in the investigation of income data has proceeded throughout the year. A collection from available corporate records in the fields of mining and manufacturing has been made for the years 1908 to 1924. The entries, tabulated on cards, are now nearly complete, except for the item of new money invested, where the information has in part not yet been secured. It is planned to calculate from this material the income from manufacturing and mining from 1909 to 1918 and 1922 to 1924 inclusive. On the basis of estimates now proceeding (made by Miss Putnam), the total value of mercantile sales at retail and at wholesale in each year from 1909 to 1924 will be added to the data already in hand. The National Bureau will then be in a position to make estimates of income for all the years from 1909 to 1924 comparable to those already published for the years

1909 to 1921. A further volume of income studies is therefore to be expected in 1927.

II. Study of Business Cycles.

Dr. Mitchell has been working all this year upon the treatise on Business Cycles. As already noted, his first draft of Volume I has been finished and is being submitted to the staff for criticism. This volume bears a subtitle, The Problem and Its Setting. It deals with the numerous working hypotheses concerning the causes of business cycles which have been presented by a succession of theorists, with the contribution of statistics to the subject, and with the more comprehensive but less definite materials afforded by our collection of business annals. Finally, Volume I presents a systematic plan of procedure to be followed in Volume II, which will give a descriptive analysis of the successive phases of business cycles,

The most important material to be used in this second volume is the collection of statistics, so far as possible by monthly or quarterly intervals, which Dr. Thorp, Mr. Villard, and their assistants are compiling for the United States, England, France and Germany. It is planned to treat each business cycle covered by our figures in each country as one unit, and to investigate the regularity with which the various phenomena of business cycles have recurred from case to case. By this plan the whole investigation will be established upon a statistical foundation. In analyzing the figures, however, the working hypotheses supplied by Volume I will play as important a part as statistical technique. Needless to say, there are many phenomena of business cycles concerning which we have no adequate statistical observations. At important points the material provided by our collection of business annals can be drawn upon to supplement the quantitative record. We do not suffer from the delusion that a definitive treatment of this important

problem can be produced, but we do hope that our systematic collections of material and our analysis will make more efficient the efforts of the numerous economists, statisticians and business men who are concerned with business cycles.

Dr. Thorp's time has been divided between completing the report on Business Annals, which has just been submitted to you through the mails, and carrying forward his contribution to the collection of statistics. In the latter field he has dealt mainly with American and British data, while Mr. Harold G. Villard has been concerned primarily with German and French statistics. In the German field, we have enlisted the cooperation of Dr. R. R. Kuczynski. French materials on a monthly or a quarterly basis are meagre. Probably we shall include in this statistical report a few series of particular significance from other countries. We hope that the whole collection can be substantially completed in the course of the current year, but we are not certain.

As suggested at the beginning, the publication of this large collection of statistical materials will be so expensive that we can hardly meet the cost out of our current funds. The directors of research believe, however, that the collection would prove so useful to so many people that it should be made widely available, and they hope that special contributions can be secured for that purpose.

III. Bond Yields and Interest Rates.

The directors of research had expected that Dr. Macaulay's important study of bond yields and interest rates in the United States since 1859 would have been ready for submission and publication in the course of the past year. But difficulties appeared, both in regard to material and method, which required not only more time but statistical ability of high order

to surmount. Fortunately the problems have been solved, the new curves are practically completed, and Dr. Macaulay is at work upon the text. One of the obstacles which had to be cleared was the inaccuracy of the figures for bank clearings in the United States, many cities, for example, in the early period reporting both debits and credits, thus doubling their clearings. This meant an entire overhauling of the data for individual cities from the beginning of reporting on a monthly basis in 1875 to the 1890's, when the figures as published become more reliable. More serious was the discovery of a "drift" in the index numbers of bond yields, shown over the long series of years under investigation, which was not due to a technical "bias" in the statistical method, but to the economic improvement in the quality of bonds. This demanded the construction of index numbers on an entirely new basis, and after much arduous experimentation a method was found, both theoretically and practically satisfactory. There is a good prospect that the National Bureau, as a result of this work, will soon make a notable contribution to statistical method, as well as a study of facts highly useful to the economist and especially to those, such as bankers and investment specialists, who have a professional interest in this subject.

IV. The Labor Market.

Another of the investigations which, like that on Bond Yields, originally was suggested as needful in the study of Business Cycles, is that now being made by Dr. Leo Wolman in the statistical aspect of the labor market. Beginning with an examination of wage changes, it became clear with the progress of the work that other elements of what is usually known as the labor market are so closely interrelated that they must be studied conjointly. Dr. Wolman has therefore been collecting and analyzing statistical measures of wages, labor cost, employment, hours of labor, output, and standards of real wages.

Statistics of wage-rates from a variety of sources have been classified by industry, by type of labor and by condition of unionization. Comparisons are being made between wage-rates and full-time wages wherever the figures are available. Where deviations from published rates occur, as happens in the fluctuations of business cycles, sample data are being obtained. The various series of total amounts paid in wages, now collected by different agencies and utilized as indices of the purchasing power of wage-earners, are being compared. From the censuses of manufactures and from various independent investigations, data are being gathered on labor cost. In the difficult technical problems connected with measures of employment and unemployment, Dr. Wolman is receiving assistance from the Census Bureau and from the various state bureaus which are regrouping many of their figures so as to allow of accurate comparison in a given industry as to total numbers on payrolls and as to the amount of wages paid. The Metropolitan Life Insurance Company is now at work on its preliminary unemployment insurance rate tables; and Dr. Wolman hopes that it may be possible to prepare a series of measures of unemployment which will indicate the general level of unemployment in the United States over a term of years and also the range of unemployment as among various industries. Dr. Wolman further plans a detailed examination of payrolls in selected industries in order to obtain data on per capita output during the phases of the business cycle. Finally a critical comparison will be made of the studies of wages and standards of living now in progress by other investigators in this field, and with the composite measures of material progress which Dr. Wolman proposes to derive from his collected statistical samples.

This, in the opinion of your directors of research, is an ambitious program, but, in such competent hands as those of Dr. Wolman, this

study should be supported not only because of its great independent interest and importance, but also because it links intimately with other major studies of the Bureau, - income, business cycles, and migration.

V. Problems of Migration.

Before the completion of his first work on Migration and Business Cycles, already referred to in the opening paragraph of this report, Dr. Jerome was busily engaged in organizing the field-work for his second study - namely the effect of the restriction of immigration upon the use of labor-saving machinery. This investigation, like the first, was undertaken by the National Bureau at the request of the Committee on Migration and the necessary funds were supplied through the Social Science Research Council. By interviews with factory executives, and by direct observation in manufacturing establishments, facilitated in many cases by the endorsement of the trade associations in the respective industries and by local Chambers of Commerce, good sampling studies have been made in such lines as highway and building construction, coal handling, handling of goods at marine and railway terminals, coal mining, and in basic industries - iron and steel, machine shops, cotton mills, saw mills, brick plants, slaughtering and packing. It is too early as yet to give any indication of the results of this careful survey. Dr. Jerome, now returned to his teaching at the University of Wisconsin, is giving half-time to the prosecution of this work for the National Bureau and to the supervision of the field agents. He expects next summer to draw up his report. It is obvious that his examination of mechanization in industry includes some phases of the problem of interest to Dr. Wolman, notably that of output, occasionally that of detailed payrolls, and the opportunity for useful cooperation is not being neglected.

A further and comprehensive enterprise, a third stage in the

migration studies, has been launched by the National Bureau in March, 1925. It was proposed by the Committee on Migration that the basic statistics of international migration be collected and critically interpreted. This proposal was approved by the Social Science Research Council, and an appropriation made to the National Bureau. Professor W. F. Wilcox of Cornell University, the authority best qualified in this field, was asked by the National Bureau to undertake this task. He accepted on the understanding that he would devote to it a large part of the summer of 1925 while he was in Europe, such supervision as was necessary during the academic year 1925-26, most of the summer of 1926, and full time under leave of absence from Cornell during 1926-27. Of the two parts of the inquiry, the first, including the collection, tabulation and publication of the international statistics, Professor Wilcox decided after careful investigation, to entrust to the Migration Section of the International Labour Office at Geneva. The officials of the International Statistical Institute, such eminent statisticians as Sir Henry Rew and H. W. Methorst (the secretary of the Institute), were of the opinion that the Migration Section, having already published a monograph on Migration Movements 1920-1923, based on the statistics of sixty countries, was the agency best fitted to do this work. Accordingly a contract was drawn up, since ratified by the governing body of the International Labour Office and by the Executive Committee of the National Bureau of Economic Research, by which the full time of a specialist in the Migration Section (compensated by the Bureau) and the extensive international contacts of the Labour Office are assured for the collection of the migration statistics of at least twenty European and seventeen transoceanic countries. The resulting volume is to be completed in July, 1926 or not later than January 1, 1927, and

is to be printed by the International Labour Office at its expense, as well as by the National Bureau if it so decides. The second part of the inquiry, with a volume more vital to the Bureau's purpose, is to include the summaries and the interpretation of the official statistics, studies by experts of various countries, and a survey of the efforts which have been made to determine the population of the earth at various dates and the evidence thus furnished of the influence of migration upon the increase and redistribution of population. To assist Professor Willcox in this second portion of his work, the International Statistical Institute, at its biennial session at Rome in September, 1925, appointed an advisory committee, consisting of Messrs. Benini (Italy), March (France), Verrign-Stuart (Holland) and Zahn (Germany).

VI. The Structure and Working of the System of Prices.

As authorized by the directors of the Bureau, Dr. Frederick C. Mills was engaged to begin, in the second half of 1925, a study of the structure and working of the price system on the basis of price statistics in the United States since 1890. On account of lack of space in the quarters of the Bureau, Dr. Mills worked during the summer at Columbia University, but since September, when Dr. Jerome left for Wisconsin, Dr. Mills and his assistants have made a welcome addition to the staff at 24th Street. The problem attacked by Dr. Mills has been that of measuring price instability, - in the first, the dispersion of prices due to the varying degrees of movement of individual commodity prices between given dates, and, second, the internal shifting or displacement of prices, causing changes in relative position. The preliminary conclusions from his analysis of price dispersion are here reported as indicating the direction the study is taking.

1. Price dispersion, and the instability due to changing price relations, do not increase with rising prices and decline with falling prices, as held by several economists. There appears to be no consistent relation between changes in the price level, when direction of change is taken into account, and degree of dispersion.
2. There is some relation between the violence of change in the price level and the degree of dispersion. In so far as the internal disturbance of price relations is affected by changes in the price level, it depends upon the violence of change, not the direction of change.
3. The degree of internal disturbance showed a definite downward trend from 1891 to 1914. The violence of the year-to-year changes was noticeably less after 1904. This downward trend indicates that during the quarter century preceding the war business and economic relations in the United States were becoming more stable, were increasingly free from violent price disturbances. The rather sharp change after 1904 may, perhaps, be attributed to the fact that the price cutting and severe industrial competition of the '90's was materially reduced after the opening of the present century.
4. The value of the index of dispersion, as here computed, seems to be independent of the price level. This conclusion is supported by the evidence mentioned in point (1) above, and also by the fact that the value of the index of dispersion for 1924 was approximately equal to the average value for the years immediately preceding the war, and lower than the values of the index of dispersion during the '90's. This is a significant fact, for it means that we have a criterion of price stability which is independent of the price level.

5. The several measure of price instability indicate that a relatively stable condition was attained during the last half of 1922. In that year, for the first time since 1914, the degree of internal disturbance was approximately equal to that which seems to be normal, judging from pre-war experience. This stability seems to have been attained by the building up of a new set of relations in the wholesale price field. The relations between commodities which prevailed before the war have been shattered, and there is no sign of a tendency to return to these relations. In the light of these facts, it is questionable if there is any justification for employing 1913 as a base year for current price comparisons.

6. Internal disturbances due to changing price relationships would be somewhat lessened if the degree of change in the price level did not vary from year to year, but would not be eliminated. The results secured to date indicate that the violence of such internal disturbances would be lessened by about 22 per cent if variations in the degree of change in the price level could be avoided.

Both in sureness of statistical attack upon a difficult and complicated problem and in the significance of the results already definitely in sight, the decision to enter this field of research, closely allied as it is to the other studies of the staff and consonant with the fundamental purposes of the Bureau, appears clearly to have been justified. The directors of research feel that in Dr. Mills the Bureau has made a highly valuable acquisition, and they strongly recommend the support and development of the work he has undertaken. At the present rate of progress, a completed first report may be expected before the end of 1926, to be published early in 1927.

Respectfully submitted,
Edwin F. Gay
Wesley C. Mitchell

Directors of Research.

