5. BUSINESS CYCLES

Introduction

During the past year the Bureau's business cycles research program has focused on new methods of analyzing cyclical episodes using selected series of economic indicators, analysis of the influence of money on secular and cyclical changes in real and nominal output, and evaluation of the structure and performance of large-scale econometric models.

Ilse Mintz has been working on what might be termed "growth" cycles. In most European countries absolute declines in the level of economic activity have been rare during the postwar period, and analysis of cyclical episodes using an absolute change framework would have yielded virtually no observations. Yet there have clearly been marked differences in the growth rate of economic activity, differences which can be translated into a cyclical framework of expansions and contractions in rates of change rather than in absolute magnitudes. Mrs. Mintz has been applying this technique to United States experience during the postwar period, and is preparing a paper to be presented at the Business Cycle Colloquium in September.

The work on money being conducted by Milton Friedman and Anna Schwartz has been concerned with the division of changes in income between prices and real output, a problem which has long been troublesome to economists. Details of their recent work are reported below.

The analysis of econometric models has yielded interesting, and sometimes disturbing, conclusions. In particular, the findings of Haitovsky, Evans, and Treyz suggest that econometric models per se have very limited ability to forecast aggregate economic activity. Zarnowitz, Boschan, and Moore have been trying to determine whether econometric models can simulate the observed cyclical behavior of economic time series, not only within the sample periods of the respective models but for lengthy extrapolation periods in which the exogenous variables in the models are subjected to specified types of shocks. These findings are reported in papers prepared for the Conference on Econometric Models of Cyclical Behavior, held in November 1969 under the joint sponsorship of the National Bureau's Conference on Research in Income and Wealth and the Social Science Research Council (see Part III of this report).

Other current studies in business cycles include Gregory C. Chow's work on econometric models, begun originally in collaboration with Geoffrey H. Moore and Arthur F. Burns, Philip Klein's study of consumer credit, about to be reviewed by the Directors, Robert Eisner's work on determinants of investment using McGraw-Hill data, and Benoit Mandelbrot's methodological work on the cyclical properties of time-series data, discussed under "R/S Analysis" in Section 9 of this report.

It is expected that the Bureau's work on econometric model analysis and evaluation will be expanded during the coming year. We have applied for a grant from the National Science Foundation to study short-term forecasting methods: subprojects in this proposal include work on large-scale model simulation, evaluation of forecast effectiveness, and developmental work on two formal models—one designed to incorporate the National Bureau's traditional view of the cyclical process, the other designed to exploit expectational and anticipatory data sets that are often neglected in existing models.

In addition to the research programs outlined above, we have devoted some attention to monitoring the current business situation. Statistical procedures that have been developed over the years in the Bureau's business cycles research program have begun to be applied to the analysis of current conditions. These procedures are designed to facilitate the comparison of current conditions with those prevailing during cyclical episodes that were eventually classified as business cycle contractions, as well

as with episodes that eventually were best classified as periods of retardation but not contraction.

F. Thomas Juster

Business Cycle Turning Points

My Occasional Paper on German business cycles has been published. This year I have interrupted the study of foreign business cycles in order to apply the experience gained so far to the dating of cycles in the United States. Only a small proportion of the period since World War II has been designated as a recession by traditional standards, and, as of early 1970, no turning point has been recognized in more than eight years. The U.S. experience in the 1960's has, therefore, resembled that of European economies, where practically no absolute declines in activity, and thus no classical recessions, have occurred. This suggests the desirability of supplementing the traditional U.S. business cycle chronology by a chronology of growth cycles, i.e., cycles in rates of growth or in trend-adjusted data.

In dating U.S. growth cycles we are also pursuing a secondary aim: to study the possibility of replacing the traditional NBER practice of handpicking business cycle turns by computerized, objective, reproducible methods.

The first task required for mechanical cycle dating is the selection of the indicators to be used. Herein lies one of the main differences between subjective and objective procedures. In the former, the analyst is free to select and weigh indicators according to the requirements of the specific situation under review. Thus, in setting cycle turns, the NBER has not relied on any fixed list of series, although certain series were, of course, regularly taken into consideration. With mechanical methods—and this is one of their main disadvantages—a fixed selection of indicator series must be used. Decisions about the contents of such a list then become a crucial step in the dating of reference cycles.

Our first criteria in choosing indicators are the usual ones: economic significance, comprehensiveness, regularity of timing, etc. In addition, however, we tried to identify a group of indicator series that would yield turns coinciding with, or at least very close to, traditional NBER reference turns. Duplication of these handpicked turns is desirable for two reasons. First, it argues for the appropriateness of substituting objective methods for subjective ones. Second, use of an indicator list which reproduces classical turns will enable us to attribute differences between growth cycles and classical business cycles to differences in concepts rather than to differences in data.

After several experiments we have, for the time being, settled on a list of seventeen indicators. When combined into indexes, these indicators yield turning dates over the 1948-61 period that are either coincident with or close to months traditionally regarded as U.S. business cycle turns.

Growth cycle turning points have been determined on the basis of these seventeen series. As expected, they are much more numerous than classical turning points from 1948 to 1969 (fourteen rather than eight turns). Also as expected, downturns in growth cycles tend to precede, and upturns to lag behind, their classical counterparts.

A detailed description of these findings will be presented and discussed at the NBER Business Cycle Colloquium in September 1970.

Ilse Mintz

Money

Because preparation of our *Monetary Statistics of the United States* for publication was inordinately time-consuming, we made less progress than planned in revising the draft of "Monetary Trends in the United States and the United Kingdom: Their Relation to Income, Prices, and Interest Rates." In this study we analyze the characteristic behavior of the quantity of money over long periods in relation to other economic magnitudes. Our purpose is to test some general propositions in monetary theory, and to test some of the em-

pirical generalizations suggested by our study of U.S. monetary history. A framework for the analysis, developed by Milton Friedman, appeared in the *Journal of Political Economy* (March-April 1970) and has been proposed for publication as an NBER Occasional Paper.

The study of trends was originally designed to exploit the availability of reasonably accurate monetary data for the United States covering an entire century, paralleled by data on national income, prices, and interest rates. After we had completed our analysis of United States data for the period 1869 to 1961, it seemed both desirable and possible to check the results with data for other periods and countries. For the United States, we added data through 1969. The most readily available monetary data for other countries were for the United Kingdom, covering 1880-1968. Accordingly, we extended our analysis, supplementing these monetary data with readily available income, price, and interest rate data.

To isolate longer-term relations, we attempt to remove from the data the effects of shorter-term (business cycle) movements. Though brief in duration, cyclical fluctuations are often large relative to the more gradual long-period changes. Hence comparisons between dates separated even by decades can be seriously distorted if the initial and terminal dates refer to different stages of the business cycle.

We eliminate cyclical fluctuations from the data by averaging over cycle phases—that is, our basic observation is either the average of an expansion (cyclical trough to peak), or a contraction (cyclical peak to trough); these periods are sometimes referred to as half-cycles. For the United States, we adopted the NBER's historical reference cycle chronology, which ends with the trough in 1961. For our purposes, we designated subsequent turns in 1966 (peak), 1967 (trough), and 1969 (peak). For the United Kingdom, we decided to revise some of the turns listed in the reference chronology available through 1938[1] and extended it through 1968. A brief description of the issues we deal with follows.

The long-term trends in money and income can be defined as comprising three elements: changes in population, in prices, and in real income per capita. We present this decomposition for trends as well as fluctuations about trends, and for levels of the series as well as rates of change. One striking feature of our empirical results is the extraordinary parallelism in the movements of money and income, both nominal and real. This parallelism is to be expected from the general theoretical framework that underlies our analysis but not necessarily from the income-expenditure framework that has been so widely accepted in recent years.

Neither the quantity theory nor the income-expenditure theory provides a satisfactory explanation of the division of changes in income between prices and output. We test a number of hypotheses that might explain it. The evidence leads us to reject some beliefs that, judging from the literature, seem to be widely held, but provides no simple and satisfactory alternative. The evidence suggests, however, that a correct hypothesis will give considerable weight to expectations about prices.

Our evidence is also inconsistent with the simple interpretation relating the quantity of desired money balances to the interest return on alternative assets. While the liquidity preference relation does play an important role, it is but one element in a much more complex pattern. We also revive the earlier work of Irving Fisher, redoing and extending some of his calculations. Fisher's conclusions and results hold up remarkably well for the period subsequent to the one he covered.

The central element in the quantity theory of money is the existence of a stable function relating the real quantity of money demanded to a small number of other economic variables. The evidence from our analysis of secular changes is highly encouraging, though not conclusive, for validation of the hypothesis.

We also examine the view that there have been long swings in growth rates for the U.S.

[1] See Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles,* New York, NBER, 1946, p. 79.

economy and other economies. Our emphasis is not on whether long swings exist, but on whether they are best interpreted as episodic or as reflecting an underlying cyclical mechanism. The monetary data support the episodic interpretation.

We hope to complete the revised draft of the monograph by the end of 1970.

Milton Friedman
Anna J. Schwartz

Study of Short-Term Economic Forecasting

A collection of essays by Rosanne Cole, Stanley Diller, F. Thomas Juster, Jacob Mincer, and Victor Zarnowitz was published in 1969. The volume, titled *Economic Forecasts and Expectations: Analysis of Forecasting Behavior and Performance,* was edited by Mincer. An Occasional Paper by Cole, *Errors in Estimates of Gross National Product,* was published in 1970.

Plans have been drawn up for a new, related but more comprehensive, research project on evaluating different types and aspects of economic forcasts and the relation between forecasting accuracy and methodology (see the report by Juster above).

Since December 1968, quarterly surveys have been conducted (in February, May, August, and December) of forecasts by those members of the Business and Economics Statistics Section of the American Statistical Association who are professionally engaged in a continuing analysis of the business outlook. The surveys were designed in cooperation with the National Bureau, which has assumed responsibility for the evaluation of their results. The analysis is processed on the Bureau's computer under the supervision of Charlotte Boschan. I have presented a description of the new survey and the press releases giving each quarter's figures in successive issues of *The American Statistician* since February 1969.

A report on the results of the first four surveys was presented at the annual meeting of the American Statistical Association in August 1969 and published as "The ASA-NBER Quarterly Survey of Economic Outlook: An Early Appraisal" in the *Proceedings of the Business and Economic Statistics Section,* A.S.A., 1969. The forecasters have, on the average, underestimated the strong increases that occurred at the time in the national aggregates of output, income, and spending—a common error of predicting too little growth and too little inflation. They have attempted, with partial success, to correct such errors through upward revisions; with the reduction of predictive spans and the use of additional information, forecasts for a given target period have generally improved in successive surveys. The revisions, however, have on the whole been insufficient, so that the short predictions, although typically more accurate than the longer ones, still understated the rise in the comprehensive economic indicators. As a rule, the dispersion of errors among the forecasts of individual participants increased with the length of the predictive span, both within and between the surveys.

Analysis of the surveys as more become available should help to answer problems concerning (a) the relation between forecast methodology and accuracy; (b) the informational value of participants' statements about the probabilities attached to their forecasts; (c) the dependence of predictions upon the underlying specified assumptions about economic policy changes and other exogenous events; (d) the structure and internal consistency of multiperiod predictions for groups of interdependent variables; and (e) the implications of the varying degree of consensus among the forecasters. In each survey, questions are asked to elicit replies that bear upon these various aspects of forecasting. Periodic assessments of the results are planned.

At the NBER Fiftieth Anniversary Business Cycle Colloquium, to be held on September 24, 1970, in New York, there will be a session devoted to a comparative analysis of short-term macroeconomic forecasts of various

types, and simulations produced by econometric models. On forecasts, I plan to prepare a report summarizing, bringing up to date, and extending the findings of the NBER studies in this area. Ex ante forecasts based on econometric models, informal models and judgment, and anticipatory data would be compared with each other as well as with a variety of predictive benchmark measures; the results should add to our knowledge of the relative accuracy, properties, and determinants of economic forecasts. On simulations, I shall draw upon the recent work for the Conference on Econometric Models of Cyclical Behavior and attempt to extend it along the lines suggested elsewhere in this report (see "Business Cycle Analysis of Econometric Model Simulations" below).

Victor Zarnowitz

An Analysis of the Forecasting Properties of U.S. Econometric Models

Our analysis of Wharton Econometric Forecasts from 1963 to 1968 and of OBE Econometric Forecasts from 1967-II through 1968-IV suggests the following:

1. For both models, the first two quarters of forecast are significantly improved by including mechanical constant adjustments based on single-equation residuals of previous periods. This finding is consistent with the proposition that constant adjustments will improve forecasts if models are misspecified and have autocorrelated residuals. Specifically, when the Wharton model is used without adjustment the first two-quarter-forecast errors for GNP and its major components are almost twice as large as the comparable simulation error, measuring the latter as root mean square (RMS) per cent error or RMS error divided by the RMS of a no-change forecast. This difference disappears in longer forecasts. When constant adjustments are used, in contrast, the error for sample period simulations and ex post forecasts is always of the same order of magnitude.

2. The true ex ante forecasts are significantly better than other ex ante forecasts for virtually all variables and all time periods in the Wharton models and for most of the variables and time periods in the OBE models. True ex ante forecasts use the constant adjustments actually made by the forecaster; the other ex ante forecasts use either no constant adjustment or a mechanical adjustment based on previous single-equation residuals. Thus the actual adjustment methods differed from other adjustment methods in that they were based partly on judgment. In turn, judgments were based on information that would affect endogenous variables, although it was not included in the specification of individual equations, as well as on the forecaster's a priori expectations of what constituted a "reasonable" prediction. The results indicate that the use of judgment appreciably improved the Wharton forecasts and noticeably improved the OBE forecasts. Finally, actual (judgmental) adjustments are better than any mechanical adjustment for the Wharton model when the realized (ex post) values of the exogenous variables are used, but are not usually superior to mechanical adjustments in ex post forecasts for the OBE model.

3. Not only are the true ex ante forecasts better than ex post forecasts using the same constant adjustments, but ex ante forecasts with mechanical constant adjustments are better than similarly adjusted ex post forecasts in almost half of the cases. The superiority of true ex ante forecasts over ex post forecasts that use the true ex ante constant adjustments is surprising. One would expect that the substitution of realized values of exogenous variables for "guessed" values should improve the forecast, if the structure of the model is correct.

The observed superiority of the true ex ante forecasts might be explained along the following lines. After the forecaster had selected the "guessed" values of exogenous variables, the preliminary forecast generated by the model may not have been consistent with his a priori expectations for the current quarter and for the

next quarter. The forecaster might then reconsider some of the constant adustments in order to make his forecasts accord more with a priori notions. If the realized values of exogenous variables are then substituted for guessed values, the resulting forecast would not be in line with either a forecast based on the model or one based entirely on a priori notions.

This hypothesis cannot explain the finding that mechanically adjusted ex ante forecasts are superior to comparably adjusted ex post forecasts in almost half of the cases. This could be due to random occurrences in a small sample or to some systematic factor. It is possible that it results from a fortuitous offsetting of underestimated government spending changes and excessively large fiscal multipliers, or from the fact that forecasters subconsciously guessed exogenous values that resulted in forecasts conforming with their good a priori idea of "reasonable," or it could be due to some other reason.

4. Most of the ex post forecast error generated with mechanical constant adjustments is due to imperfect covariation rather than imperfect central tendency or unequal variation: Thus, forecast errors are due primarily to unsystematic fluctuations rather than consistent errors in forecasting trends or cyclical fluctuations. In addition, the annual forecast error for GNP is substantially smaller than the sum of the absolute value of errors in the four component quarters. This finding suggests that these models may be better suited for predicting annual rather than quarterly movements, despite their quarterly nature.

5. Closer analysis of both the sample period simulations and ex ante and ex post forecast errors suggests that errors might have been lower if the fiscal multipliers implied by the models were smaller and if the monetary multipliers were larger. Since fiscal variables tend to enter these models as simultaneous determinants of GNP while monetary variables enter through the lagged structure, the degree of simultaneity in the economy may be overstated by the models and the contribution of lagged variables understated. This hypothesis is strengthened by the finding that there is substantial propagation of error in the system: the mean square error of total GNP is much larger than the mean square error of the sum of the individual aggregate demand components. In part, this problem may be the result of faulty estimation techniques, a conclusion consistent with recent findings that the results obtained by using two-stage least squares are virtually indistinguishable from those obtained with ordinary least squares for macromodels of the size examined here.

6. Some of these difficulties might be mitigated by a method of estimation that we call ROS (regression on simulated values). The method involves, first, initial estimation of the complete model by the usual methods, then second, use of the *complete system solution* values rather than observed values of the endogenous variables to re-estimate the coefficients. Our results indicate that this method reduces the average forecast error for the first two quarters, and also reduces the size of the fiscal multipliers, the degree of simultaneity, and the propagation of error for the first few periods. However, errors using ROS coefficients are slightly larger than ordinary methods for later quarters, suggesting that ROS coefficients will be most useful if they are estimated with complete system solution values for lagged as well as current values.

We are currently updating and extending our paper for the Conference on Econometric Models of Cyclical Behavior. We plan to contrast econometric forecasts with the results of other forecasting methods (including autoregressive models), to expand our analysis of the causes of forecast error, and to examine the basic question whether a different strategy should be used to build forecasting models than to build structural models. Poor econometric forecasts in late 1968 and early 1969 have confirmed our previous observation that the econometric forecasting record through 1968 was better than an analysis of the econometric models would have led us to anticipate. While we feel that econometric forecasting models may improve for a number of reasons, there is

nothing in the recent record to justify reliance on the accuracy of forecasts made with these models.

Michael K. Evans
Yoel Haitovsky
George I. Treyz

Business Cycle Analysis of Econometric Model Simulations

A comprehensive report under the above title has been completed and will be published in the proceedings of the Conference on Econometric Models of Cyclical Behavior. The completed work covers three quarterly models of the U.S. economy, one prepared by the Wharton School, another by the Office of Business Economics (OBE), and the third prepared jointly by the Federal Reserve Board, the Massachusetts Institute of Technology, and the University of Pennsylvania (FMP). Simulated series for a variety of important national aggregates and cyclical indicators were examined for each of these models, including GNP in current and constant dollars, employment, real expenditures on consumption and types of investment, personal income, corporate profits, price and wage levels, the unemployment rate, new and unfilled orders, interest rates, etc. The analysis includes complete-model simulations for (a) selected six-quarter periods around recent business cycle turns; (b) sample periods of varying length between 1948 and 1968; and (c) hundred-quarter periods starting in 1966 or later and extending into the future. One set of nonstochastic simulations of a given type was required for each model, but for the stochastic simulations, which relate to (c) only, as many as fifty computer runs per model were made. The purpose was to gain information on the variability of responses to different configurations of shocks, and to avoid excessive reliance on any particular, and possibly idiosyncratic, shock distribution.

The following are some of the main conclusions of the study.

1. For the nonstochastic sample-period simulations, there is evidence that the calculated values tend to drift away from the actual values, though in varying degree and not necessarily continuously. In simulated series for trend-dominated variables, such as GNP, the drift appears as an increasing underestimation of growth. The discrepancies between the levels of the simulated and actual series are generally much greater than those between the corresponding quarterly changes. Simultaneous estimation over long periods of time, with model-generated values of lagged endogenous variables, is liable to produce autocorrelated errors which cumulate, thus throwing off-base the affected multiperiod predictions. Since the chance for such error cumulation is greater, *ceteris paribus,* the longer the distance from initial conditions, models with longer sample periods are at a relative disadvantage in this test.

2. Simulations of this type also indicate that models such as Wharton and OBE produce a progressively more heavily damped time-path of aggregate output. Only the first one or two recessions covered have been reflected to some degree in the declines of the simulated real GNP for these models. The FMP series are too short to allow a test of whether this model would have simulated another contraction beyond the two included in the sample period.

3. Each of the six-quarter simulations covers only one business cycle turn and starts from new (correctly measured) initial conditions: hence any one of these episodes has an approximately equal chance to be replicated, and no systematic changes over time are observed in these data. The simulations are not significantly better when they start one quarter ahead of the reference turn than when they start two or three quarters ahead: small shifts in the base have minor and unsystematic effects.

4. About one-quarter and one-third of the recorded turns are not matched by the short and long sample-period simulations, respectively. Missed turns, large discrepancies in timing, and drastically reduced amplitudes of fluctuation are all major sources of error in the

simulated series, which are associated with turning points in the actuals. For the more cyclical and volatile variables, such timing and amplitude discrepancies result in especially large errors.

5. The simulated series are for the most part classifiable according to their timing at business cycle turns, but some of them are not because they have too few turning points. These are mainly series for comprehensive aggregates of income and employment, which should have shown good cyclical conformity and typically coincident timing. Although the simulations do differentiate broadly between the groups of leading, coincident, and lagging indicators, these distinctions are much less sharp in simulations of all types than in the actual data.

6. Nonstochastic simulations for future periods, unlike those for sample periods, produce smooth trend-dominated series for the comprehensive indicators of over-all economic activity, rather than series with recurrent, if damped, fluctuations. Thus the models examined here (Wharton and OBE; the evidence for FMP is incomplete) do not generate cyclical movements endogenously. It is important to note that, in these "control solutions," the projections for the exogenous variables are essentially growth trends, without the fluctuations or disturbances that are often pronounced in the corresponding historical series. (The sample-period simulations, on the other hand, fully incorporate all these exogenous movements.)

7. In the ex ante, hundred-quarter simulations with random shocks applied to the extrapolated model equations, fluctuations are frequent but in large part too short to qualify as cyclical movements. When autocorrelated shocks are used (to reflect the serial correlations among the residuals in the sample-period equations), the result is much smoother series whose upward trends are interrupted less frequently by longer but also smaller declines. This procedure is often helpful, but mainly with the more volatile series. In general, the simulated series have considerably weaker cyclical elements, and relatively stronger elements of long trends and short erratic variations, than the historical data for the same variables.

8. Since the shocks used may not be adequately scaled, ratios of the stochastically simulated to the control series were also analyzed, in the expectation that they would show greater cyclical sensitivity. The expectation was confirmed, but the ratio series are also much more erratic than the shocked series proper.

9. Cumulated diffusion indexes constructed from the ratio series display specific cycles whose average duration is similar to that of cycles in trend-adjusted GNP, as recorded in the postwar period; the turning points in these index movements provide reference dates on which to base measures of conformity and relative timing for this set of stochastic simulations. The results for several sample runs agree with the general conclusion expressed in the last sentence of point 5 above.

Further work in this area should include more standardized simulations (notably a common sample period for the different models) for the sake of comparing the results. It should cover some other models as well: the more diverse the models, the greater the potential gains from such studies (provided that the systems are generally reasonable by the criteria of economic and statistical theory). Still another promising extension of the analysis would be to impose shocks or fluctuations on the projections of the exogenous variables and study the effects of such disturbances on the ex ante simulations of the economic system.

This study would not have been possible without the active cooperation of the builders of the models included. It also owes very much to the work of Josephine Su, our research assistant.

Victor Zarnowitz
Charlotte Boschan
Geoffrey H. Moore

Econometric Model of Business Cycles

A progress report, "An Econometric Model of Business Cycles," was completed and pre-

sented at the Conference on Econometric Models of Cyclical Behavior in November 1969. The paper, prepared by Geoffrey H. Moore and myself with the assistance of An-loh Lin, is a simplified, aggregative version of the model. The introduction summarizes the main theoretical ingredients explaining the cyclical process. Twenty-five structural equations are formulated in section 2, including five identities. Statistical estimates of the structural parameters are given in section 3, using quarterly data on the U.S. economy from 1949 to 1967. Some aspects of the errors of the model are analyzed in the last section. Also included is our reply to comments from R. A. Gordon and M. S. Feldstein, which discusses relevant issues and should be treated as a part of this paper.

Additional empirical tests are currently being performed and, depending on the outcome, a revised version of the model may be prepared.

Gregory C. Chow

Determinants of Investment

Collection of McGraw-Hill data relating to capital expenditures of 1967 and 1968 has now been completed. Checking and processing are under way. The body of individual firm data will thus extend for fourteen years, from 1955 through 1968. Further computer analysis and an extensive report along lines indicated previously are in prospect.

A paper on "Investment Anticipations and Realizations: Cross Sections and Time Series of Data of McGraw-Hill Surveys, 1955-66" was completed and presented to the CIRET Conference in Madrid in September 1969. The exchange with Jorgenson and Stephenson and Hall and Jorgenson was continued in "Once More on that 'Neo-Classical Theory of Investment Behavior' " (with M. I. Nadiri), *Review of Economics and Statistics,* May 1970, and "Tax Policy and Investment Behavior: Further Comment," *American Economic Review,* September 1970.

Robert Eisner

6. FINANCIAL INSTITUTIONS AND PROCESSES

Interest Rates

The study of interest rates, undertaken with the aid of grants from the Life Insurance Association of America, is concerned with the behavior, determinants, and effects of interest rates. Publications to date include *The Behavior of Interest Rates: A Progress Report,* by Joseph Conard; *The Cyclical Behavior of the Term Structure of Interest Rates,* by Reuben A. Kessel; *Changes in the Cyclical Behavior of Interest Rates,* by Phillip Cagan; *Yields on Corporate Debt Directly Placed,* by Avery Cohan; *The Seasonal Variation of Interest Rates,* by Stanley Diller; and *Essays on Interest Rates,* Volume I, edited by Jack Guttentag and Phillip Cagan. The study "New Series on Home Mortgage Yields Since 1951," by Jack Guttentag and Morris Beck, is in press.

In addition, Volume II of "Essays on Interest Rates" is undergoing Board review. It contains (in addition to reprints of the Diller study and parts of the Cagan and Kessel studies mentioned above) the following papers: Jack Guttentag, "Introduction"; Mark Frankena, "The Influence of Call Provisions and Coupon Rate on the Yields of Corporate Bonds"; E. Bruce Fredrikson, "The Geographic Structure of Residential Mortgage Yields"; Avery Cohan, "The Ex Ante Quality of Direct Placements, 1951-61"; Thomas J. Sargent, "Expectations at the Short End of the Yield Curve; An Application of Macaulay's Test."

Phillip Cagan's manuscript on "A Theory of Monetary Effects on Interest Rates" is still