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1. ECONOMIC GROWTH

TAX POLICIES
FOR ECONOMIC GROWTH

This project focuses on the influence of various elements of the tax system on the economic processes which contribute to the expansion of production capability by increasing the volume of resources and their productivity. Our research efforts, therefore, aim at adding to our knowledge about the influence of the tax structure on the incentives and capabilities of taxpayers to undertake activities which contribute to growth in this way.

Four sets of research projects are now under way. The first of these, financed by a grant from the Rockefeller Brothers Fund, is concerned with the effects of business income taxes on capital formation and innovation. Challis A. Hall, Jr., Yale University, is investigating the impact of various features of the corporation income tax on corporate policies with respect to capital expenditures and other activities relevant to business growth. Melvin I. White, Brooklyn College, initiated a study of the influence of corporate income taxation on innovation in the textile industry which is being continued by Thomas M. Stanback, Jr., New York University. I have undertaken two studies, reported on below, of the effects of postwar changes in depreciation policy on capital outlays and corporate financing.

A second set of projects, financed by a grant from the Life Insurance Association of America, deals with the effects of personal income taxation on incentives to earn, save, and invest. Daniel M. Holland, M.I.T., is examining the effect of high and graduated personal income tax rates on the amount and direction of personal effort by upper-income individuals. Roger F. Miller, University of Wisconsin, is studying the effects of the tax treatment of capital gains and losses on personal saving and investment. Of particular relevance to small companies and unincorporated business

is a study of the effects of the present income tax treatment of losses and income fluctuations on willingness to assume risk. This research will be undertaken by C. Harry Kahn, Rutgers University, beginning early this year.

The rapid postwar growth of a number of countries in Western Europe and of Japan is often attributed in significant part to their tax policies. A third project, jointly sponsored by the National Bureau and the Brookings Institution Studies of Government Finance, has been undertaken to investigate foreign experience in this regard. E. Gordon Keith, chairman of the planning committee for this project, has arranged for the preparation of a monograph by a recognized authority in each of the countries to be included in the study. These monographs will be the basis for a research conference to be held at the Brookings Institution in Washington in December 1963, to which a limited number of American experts on taxation and growth will be invited in addition to the authors of the papers and two discussants from each of the countries. The countries to be covered and the authors of the monographs are: United Kingdom, Allan Williams, University of Exeter; Sweden, Lief Muten, University of Uppsala, and Karl Faxen, University of Stockholm; France, Pierre Tabatoni, Faculty of Law, University of Paris; Italy, Francisco Forte, University of Turin; Germany, Carl Hauser, University of Frankfurt; Japan, Ryutaro Komiya, University of Tokyo; the Netherlands, Cornelis Godehart, University of Amsterdam.

Fourth, we are undertaking jointly with the Brookings Institution Studies of Government Finance an experts' conference on the role of direct and indirect taxes in the federal revenue system. The purpose of this conference is to examine the differential effects of various kinds of indirect and direct taxes on personal effort, saving, investment, the allocation of resources, and the efficiency of business operations. The principal emphasis of the conference, therefore, is on the relation between the use of these alternative forms of taxation and the nation's economic growth. The conference will also seek to give an objective analysis of the effects of increasing federal use of indirect taxes on the distribution of tax burdens, on the fiscal position of states and localities, and on American exports and our balance-of-payments position. The experience of selected European countries, Canada, and Japan with direct and indirect taxes will also be examined. John F. Due, University of Illinois, is chairman of the planning committee.

Four major papers will be prepared for the conference, which will be held early in the fall of 1963. Arnold Harberger, University of Chicago, is doing a paper on the relative effects of direct and indirect taxes on the savings-consumption ratio, investment, and personal effort. Richard Musgrave, Princeton University, is preparing a paper on the relative significance of direct and indirect taxes for international trade and other aspects of resource allocation. Douglas Eldridge, Claremont Men's College, will compare direct and indirect taxes from the standpoints of administration and compliance problems, intergovernmental fiscal policy, and equity criteria. Otto Eckstein, Harvard University, will describe the experience of various countries with direct and indirect taxes and analyze the significance of differing relative emphasis on alternative forms of taxation for growth in these countries.

NORMAN B. TURE

CORPORATE PROFITS TAXATION
AND ECONOMIC GROWTH

The purpose of this study is to ascertain how taxation of profits influences decisions that are important for corporate growth and for the growth of the economy. Corporate activities that are especially relevant for growth include capital expenditures, research and development, the introduction of new products and processes, and the financing of expansion. The basic research technique adopted is interviews with corporate executives, supplemented by quantitative analysis.

During 1962 I interviewed executives in twenty-three companies, almost half the number contemplated for the study. Arrangements have already been made for several additional

interviews, and the bulk of the field work may be completed by the summer of 1963. Significant findings appear to be emerging from these interviews, but the coverage of the prospective sample is not yet sufficient to justify the delineation here of these results.

Considerable progress has been made in estimating the quantitative impact of profits taxation on saving, one sector where quantitative analysis can supplement the main line of inquiry. For this analysis two benchmark years were selected, one in the mid-1930's and another in the mid-1950's. Comparisons have been made of the possible impacts on saving associated with replacing corporate tax revenues by other tax forms. Estimates relating to alternative tax structures are not yet completed, and some verification of technical assumptions must be achieved before these estimates can be regarded as plausible.

CHALLIS A. HALL, JR.

EFFECT OF CHANGES IN TAX LAWS ON MODERNIZATION EXPENDITURES IN THE TEXTILE INDUSTRY

Major emphasis is being placed upon determining whether or not changes in the tax laws and regulations (i.e., the liberalized depreciation provisions under the Revenue Act of 1954, the shorter service levies granted the textile industry in the fall of 1961, and the investment credit provision of 1962) have resulted or may be expected to result in increased outlays for modernization in the textile industry. This industry has been chosen for special study because the provision for shorter service levies was made earlier than in other industries, and it is widely thought that a relatively large proportion of the industry's equipment is in need of replacement and that it has been slow to take advantage of a number of significant improvements in textile equipment which have become available in recent years.

The investigation is to be made largely through interviews with textile executives. A tentative questionnaire has been designed to determine whether or not changes in the tax laws have resulted in increased outlays for modernization or can be expected to do so in the near future. In addition, a number of questions are to be asked about the investment process (e.g., the method of determining the desirability of new equipment, the importance of cash flow, policies pursued with respect to modernization). The purpose of these questions is to discover, if possible, why tax changes have or have not been effective.

My research time is currently being spent in examining some of the technical aspects of modernization in the industry and its possible effects on costs and quality. Both the American Textile Manufacturers' Institute and the American Textile Machinery Association are providing information and assisting in scheduling interviews.

THOMAS M. STANBACK, JR.

DEPRECIATION STUDIES

On several occasions since World War II, in the interest of providing both additional incentives and capacity for private capital formation, changes have been made in the rules governing depreciation for tax purposes. Although there is a widespread consensus that the tax treatment of depreciation has significant effects in these respects, little attempt has been made to appraise the results of these changes empirically. Two of our studies are specifically concerned with this question.

The first of these inquiries aims at determining the extent to which business taxpayers have made use of the accelerated depreciation provisions introduced in 1954. A considerable volume of data on the use of the various depreciation methods, drawn from tax returns and questionnaires, has been developed by the Treasury Department and by the Statistics Division of the Internal Revenue Service. We are relying on this material for developing some aggregate measures of the use of accelerated depreciation methods and for analysis of the extent to which the use of various

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methods is associated with particular types of property, the length of useful life of the facilities, the taxpayers' industry, or size of the company.

Our preliminary analysis revealed the need for substantial refinement of these data. Additional processing was undertaken by the Statistics Division of the IRS late in 1962; it is now anticipated that the reprocessed data will be available early in 1963.

A second study, based upon a continuous sample of identical companies for the years 1946-59, aims at determining the significance of changes in cash flow for companies of different size and industry with respect to their capital outlays and other uses of funds. A pilot project is now under way in the Statistics Division of the Internal Revenue Service to determine the feasibility of obtaining the data required for the study, with appropriate measures to prevent disclosure of information for individual companies.

NORMAN B. TURE

EFFECT OF THE INDIVIDUAL INCOME TAX ON PERSONAL EFFORT

This study is concerned with the effect of high and progressive income tax rates on the amount and direction of personal effort. The inquiry will be focused on certain groups— corporation executives, entrepreneurs, those in professional practice, scientific and technical personnel, and individuals with substantial investment income. Not only are these individuals deemed to play a major role in the processes of economic growth but they are also those most likely to be adversely affected by high marginal rates of tax. Research on this problem is to be organized around three questions: (1) How heavy and how progressive, in fact, have income taxes on members of these groups been? (2) Have their incentives to work, save, and assume risk been affected by the taxes they bear? (3) Have tax considerations resulted in a diversion of effort by members of these groups from activities which contribute to growth to those which minimize tax liabilities?

With the assistance of Wilbur G. Lewellen, I started work on answering the first of these questions last summer. To date our efforts have been devoted to developing the analytical framework for measuring how much compensation the corporate system has managed to provide for a strategic group of employees— top executives, usually the three major officers of a company. This is an attempt to see to what degree the impact of high tax rates on salary has been softened by alternative forms of reward, particularly pensions and stock options.

Our plan of procedure is to try to express all other compensation arrangements in terms of a salary alternative—that is, a series of payments which, over some appropriate span of time, would yield as much after-tax compensation or benefits as did the actual set of pension rights or stock options provided. In the case of a company-provided pension arrangement, for example, we seek to find out "how much of an increase in salary would be required if the executive were to go into the market on his own and purchase for himself an arrangement with an insurance company similar in form and equal in value to that promised him under his company's pension plan." In other words, when a company pension plan is initiated and a benefit expectancy contingent on continuation of current salary (and, of course, survival to retirement age) is created, a stream of n annual salary equivalents is generated between that year in which the executive's age is, say, X (where $X = 65 - n$) and the year in which the executive will be 65. If the benefit expectancy increases the next year, a new stream of annual salary equivalents, $n-1$ in all, additive to the initial n component stream will be generated. Similarly, additive or subtractive sets of annual streams are required when tax rates change. On this score, and because benefit expectancies generally change when salaries change and also, of course, when the plan's benefit formula changes, it is evident that the salary equivalent of a pension in any one year will be the sum

of that year's components of many sets of annual streams of salary equivalents.

The next step will be to develop a salary alternative for stock options. We intend to do this regardless of whether this particular compensation arrangement is affected by the reform of the tax structure on which congressional hearings have started. This reflects a judgment on our part that there is still inadequate knowledge of how important stock options, as well as pensions, may have been in providing compensation. Our preliminary work suggests that they have accounted for a sizable portion of executive compensation over the last decade. If this turns out to be so, and if these amounts of reward were necessary to elicit the level of executive effort that was forthcoming, then changes in the present tax treatment might have deleterious consequences on both effort and growth.

DANIEL M. HOLLAND

PERSONAL CAPITAL GAINS TAXATION AND ECONOMIC GROWTH

This study concentrates on the effects which the tax treatment of personal capital gains has upon the savings and investment behavior of persons in the United States. Its rationale is indicated by the following propositions.

Other things being equal, the rate of growth of the United States economy will be greater if (1) aggregate personal savings and investment are increased; (2) the mobility of capital in transferring among alternative investment opportunities is increased; (3) capital flows into those investment opportunities with a relatively high expected rate of profit; (4) the rate of "risk discount" is low rather than high, so that risk taking is not unduly discouraged; and (5) the flow of capital from personal savings into real investment takes place through channels offering a wide rather than narrow range of alternative opportunities.

Implicit in these propositions is a commitment to the economy as it now exists, with its emphasis upon consumer choice, free markets,

and productivity. Acceptance of these propositions implies that the study should investigate how the differential tax treatment of capital gains (relative to other forms of income) affects the decisions of individuals about (1) the proportion of their income reserved from current consumption expenditures for savings and investment; (2) transferring their accumulated savings (capital) among investment alternatives; (3) balancing profitability against security in their portfolio; and (4) the channels through which their savings are translated into real investment.

The method of investigating these questions is a multiple regression study in several parts. The dependent variables are those shedding light directly upon the above questions: the degree to which risk aversion is evident in the portfolios selected by persons, the rate of personal savings over time per person, the degree to which capital gains are realized from a given portfolio containing a given amount of unrealized gains, and so on. The predetermined variables are all those possibly affecting such personal decisions, including the differential tax advantage of capital gains (insofar as data on them can be acquired), age, income, total accumulated savings, occupation, location of residence, and so forth. Their inclusion in the study is necessary in order to identify the *net* effect of the differential tax treatment of capital gains.

Much of the data to be used in the study will come from a 1 per cent sample of individual income tax returns to the State of Wisconsin which is being prepared, as part of a broader project, by the Social Systems Research Institute of the University of Wisconsin. A stratified subsample of this group is being drawn for an interview survey, which will include some motivational questions designed to get at the reasons why certain actions were or were not taken. Efforts are now being made to supplement these data by trust and estate returns. In the case of estate returns, the information contained in the return will take the place of an interview.

The basic data from tax returns have been collected and are being prepared for use in

computers. Other data have yet to be collected. Currently work is in progress on developing an analytical model to provide a framework for the empirical investigation, on designing the subsample for the interview survey, and on designing the interview questionnaire to be used.

ROGER F. MILLER

THE TAX TREATMENT OF FLUCTUATING INCOMES

In the absence of provisions for averaging income through time, a graduated annual income tax subjects fluctuating incomes to heavier taxation than stable incomes. Given two probability distributions of expected incomes totaling the same amount over a period of years, that with the greater dispersion will ordinarily result in a lower mean expected after-tax income. Yet some types of economic activity that are especially important in the process of economic growth (such as innovations and new business ventures) involve relatively great risk and dispersion of income over time. How the tax system deals with the problem of income variability thus presumably has some bearing on economic growth. In particular, the tax treatment of business losses and fluctuations in business income may exert an important influence on the rate at which new businesses are formed and on their ability to survive early reverses.

Little empirical evidence exists on any aspect of the relation between income variability and the income tax. The objective of the study which I am undertaking is to (1) measure the difference in tax liability between taxpayer groups with fluctuating incomes and those with relatively stable incomes; (2) appraise the extent to which existing provisions in the tax law, such as allowances for current loss carry-back and carry-forward, have mitigated the effect of income fluctuation on tax liability; (3) appraise the effectiveness of various proposals for income averaging.

To throw light on these questions, I intend to make use of the 1 per cent continuous identical sample of Wisconsin taxpayers for the years 1947-60, referred to above in Roger Miller's report, and to draw from it a sub-sample of taxpayers reporting profit or loss from unincorporated business and profession. This constitutes a group with higher than average income variability as well as the group at whom most of the averaging provisions now in effect are aimed. The sample, it is hoped, will make possible the preparation of a time profile of these taxpayers' incomes and federal tax liabilities over the period mentioned. Their actual effective rate of tax over this period can then be compared with the rate which would have obtained had some hypothetical average of their incomes been used to compute their tax base. It is also hoped that the data will make it possible to test the efficiency of the present loss carry-over provisions. We should be able to determine the extent to which taxpayers with net operating losses in one year were able to offset such losses against income reported for the three years preceding and the five years following the loss year. At present there is only the sketchiest information on the effectiveness of these provisions.

C. HARRY KAHN

LONG SWINGS IN THE GROWTH OF THE LABOR FORCE

The purposes of this study, conceived within the framework of Abramovitz' inquiry into long swings in the economy as a whole, are, first, to describe long swings in the labor force of the United States over the past century; second, to determine as far as possible the factors responsible for these swings; third, to see what light the long-swings approach can throw on the determinants of labor force growth in recent decades; and, fourth, to consider the implications of the findings for projections to 1970 and later. Publications resulting from work to date are *The American Baby Boom in Historical Perspective,* Occasional Paper 79, and "Influences in European Overseas Emi-

gration before World War I," published in *Economic Development and Cultural Change,* April 1961. The status of the work remaining, which may be divided into two parts, is indicated below.

1. Long Swings in American Labor Force Growth: Basic Facts and Factors, 1870-1960

Preliminary tables and analytical notes dealing with long swings in American labor force growth from 1890 to 1950 have been circulated among the National Bureau's staff and others for comment. The subjects covered included (1) the nature of the evidence on swings in labor force growth and the timing of these swings in relation to other economic and demographic magnitudes; (2) industrial, spatial, occupational, and demographic (age, sex, color, and nativity) characteristics of swings in labor force growth; (3) the role in these swings, both at national and regional levels, of the natural increase in the population of working age, participation rate change, and migration, and the changing importance of these sources of labor force growth in successive swings; and (4) the causes of the swings.

Since the completion of the draft tables and analyses, the calculations have been completely redone to take account of revisions in the data and extended to cover the period beginning with 1870.

Progress has been made in laying out the work for a revision of the draft tables and analyses, incorporating the results of the 1960 Census and certain additional analytical features, and in weaving the materials into an integrated report.

Among the additional analytical features are (1) an examination of interrelations between swings in output, capital, and labor force growth at detailed industrial and occupational levels; this part, which will utilize earlier work by Burns, Shaw, Frickey, Kuznets, Creamer, and others, should amplify the picture of long-swing relations among these factors drawn by Kuznets and Abramovitz at more aggregative

levels; and (2) addition of a section on the changing character of long swings in labor force growth. The idea to be developed is that prior to World War I, long swings in labor force growth did not generate an "echo effect." However, with the restriction of immigration and the growth in importance of urban relative to rural population, this may no longer be true, and current and future analyses of long-swing phenomena may need to take cognizance of the emergence of a significant echo effect.

2. Recent and Projected Labor Force Growth in Historical Perspective

Two features of labor force growth since 1940 stand out when compared with previous experience. One is the disproportionately high contribution of change in the labor force participation rate to the total increase. The other is the marked acceleration in the rate of growth of labor force participation of women over 35. This analysis, which is founded on the study of the period since 1870, seeks to determine what light the long-swing approach can throw on these recent developments, and considers the implications of the approach for projections to 1970 and later.

Work to date has been concerned with blocking out the main lines of the analysis. Annual current population reports and decennial census data for the period since 1940 have been organized to show participation rate changes by age and sex group for the total population, divided (where possible) according to such various characteristics as school enrollment, marital status, children, color, and rural-urban residence. Related labor market information, such as unemployment rate, work experience, median income, and marital status, also by age and sex, has been collected. In addition, data on persons not in the labor force, by age, sex, and characteristics such as education and ability to work, have been assembled.

Three types of analytical calculations are being performed on these data in order to derive clues to the factors involved. The first distributes actual labor force growth since

1940 among natural growth of the working age population, immigration, and participation rate change. The second estimates the composition of labor force additions desired by employers because of occupational changes alone. The last estimates the age and sex composition of labor force additions to each occupational class that result solely from natural growth of the working age population. Preliminary calculations of this type have been completed for each of the three decades 1940-50, 1950-60, and 1960-70 (the last on the basis of Bureau of Labor Statistics projections). The results of these rough calculations suggest that the proposed approach is feasible and will yield useful results.

A major part of the work remaining to be done will involve going through the analysis anew, taking advantage of suggested improvements in technique and of more precise and newer data. With regard to the latter, Gertrude Bancroft has kindly agreed to furnish some unpublished BLS and Census data, which will increase the reliability of our calculations. In addition, there are now available further tabulations from the 1960 Census, as well as a revised BLS labor force projection.

Completion of several sections of the study is expected during the course of the year, and it should all be finished early in 1964.

RICHARD A. EASTERLIN

LONG SWINGS IN URBAN BUILDING ACTIVITY

A draft manuscript on this investigation into long swings in urban building and real estate market activity has been prepared. The first three chapters deal with local cycles in particular urban communities which met our stringent requirements for length of historical record. To avoid undue influence in the averages of the more recent decades and to expose persistent tendencies, we included only communities with building records extending back to the 1870's and covering two full pre-1914 cycles. Data for some thirty urban areas

located in three continents and in eight countries met this requirement. They provided 128 series and 328 long cycles equally divided between building and other activities.

Some of the tentative findings of this part of our investigation are: (1) Demand for non-residential building rises and falls with demand for residential building. Among types of non-residential building, public building shows the greatest irregularity and the longest lags. (2) There are systematic and pervasive relations between shifts in different elements of the real estate pricing system. The price of vacant land shows a definitely speculative character with relatively high amplitude; occupied rentals and cost of building respond to long-wave impulses weakly and with a lag. (3) Local building waves involve wavelike recruitment of labor force through net migration which reaches comparatively high amplitudes ten to fifteen times that of local marriage series. (4) As a cumulative result of the above influences, the supply of building responds with an average lag of four years to changes in demand for building, producing in consequence the high-amplitude and "neutral" timing of the vacancy pattern shown in Chart 1.

CHART 1

Average Long-Cycle Patterns, Residential Building and Vacancies, Six Cities, 1851-1940
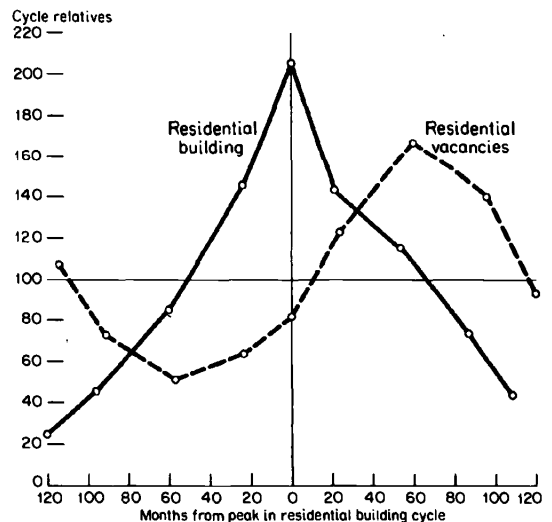
NOTE: The building pattern is based on long specific cycles in residential building. The vacancies

pattern is constructed by using the long cycles in residential building as a reference framework; hence it shows the behavior of vacancies during the long cycles in building. The composition of the two patterns is as follows (no. of cycles in parentheses):

	Residential Building	Residential Vacancies
London	1856-1914 (3)	1873-1914 (2)
Glasgow	1864-1912 (2)	1864-1912 (2)
Berlin	1851-1900 (3)	1851-1900 (3)
Hamburg	1878-1910 (2)	1878-1910 (2)
Stockholm	1870-1940 (3)	1893-1940 (2)
St. Louis	1892-1933 (2½)	1892-1933 (2½)

The remaining three chapters deal with measures and movements of nationwide urban building which, for a few countries (United States, England and Wales, Italy, Australia), can be analyzed on both a nonresidential and a residential basis. As in local cycles, non-residential building participated in all the residential building waves, sometimes leading and sometimes lagging behind. The average durations of long waves in the nationwide series are nearly the same as in the local series for the same countries, clustering between seventeen and nineteen years, but the nationwide durations show less variation about the mean. The average amplitude of swings in the nationwide series is about one-third less than in the corresponding local series.

The concurrent movement of local industrial building and labor force growth provides one of the keys to the coalescence of nationwide and local wave patterns, for an expansion in local building is only a local response to increased demand for goods running through the whole economy. If local growth tends to propagate itself via an import multiplier and accelerator relationship, any marked decline generated by a major war or its immediate aftermath tends to become propagated throughout the industrial economy and its urban communities.

Two subsidiary investigations, designed to produce reliable long-swing measures back to

the 1840's of residential building, residential unit values, and total building, have been carried forward. Drafts of two documents have been prepared: "American Residential Building, 1840-1939" and "Value of Nonfarm Building, Residential and Nonresidential, United States, 1850-1939." The former, which will shortly be submitted to the Board of Directors as a proposed technical paper, provides a detailed explanation of a new nationwide series on residential units erected since 1840. This series was anchored at one end upon the 1840 Census of dwellings erected, and at the other end upon the extensive data on nonfarm dwelling stocks by year built disclosed by the 1940 Census. In the middle years it is pinned to national projections founded on decade rates of residential building in Ohio, a new body of information developed in the research effort, as well as on the various permit series already used by other investigators. While the year-to-year pattern of movement implicit in the estimates for 1890-1939 prepared by David Blank and the Bureau of Labor Statistics were used with little modification, the decade patterns of movement in the new series and its secular rate of growth differ appreciably from the previous estimates.

MANUEL GOTTLIEB

AGRICULTURAL PRODUCTIVITY

Since any productivity measurement formula either implicitly or explicitly assumes something about both the form of the aggregate production function for the industry and the numerical values of its coefficients, many of the questions raised in regard to the correctness of these measurement procedures can be investigated more easily by asking these questions directly about the production function. As part of my work on the sources of measured increases in aggregate productivity in United States agriculture since 1940 (supported in part by a grant from the National Science Foundation), I have recently turned toward the statistical estimation of an aggregate production

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function for agriculture based on cross-sectional data for various census years. I expect this work to shed some light on three important problems in productivity measurement:

1. *The role of changes in the level of formal education in explaining observed productivity increases.* Previous work, such as Denison's or my own, essentially imputed part of the productivity increase to changes in education, using cross-sectional income-by-education tabulations as the source of its weighting scheme. There are many difficult questions raised by the use of income-by-education data, and one cannot rule out the possibility that the observed associations may be in large part spurious. Moreover, before the 1960 Census, the only income-by-education data that are available are for the United States as a whole. While one may not doubt the proposition that education is important in the large, it is not obvious that it is very important in agriculture. By introducing the education of the agricultural labor force as a separate variable in the production function, it becomes possible to *estimate* rather than to assume its coefficient.

2. *The possibility of disequilibrium and the inappropriateness of the usual weighting schemes that rely on market prices.* To measure that part of productivity change which is a result of a shift in the production function (an improvement in the state of technological knowledge), we have to weight the various input series by their respective production function coefficients. Assuming production functions that are linear or linear in the logarithms, constant returns to scale, and competitive equilibrium (at least in the weight-base period), these coefficients can be approximated by input market prices or by their relative shares in total costs. But if a sector is in continuous disequilibrium (as has been alleged to be true of agriculture), a weighting scheme based on factor shares may be incorrect for productivity comparisons. Many agricultural economists have held that the marginal product of labor in agriculture is substantially

below the going wage rate for hired labor, and that the marginal product of capital is substantially above the conventional bank or mortgage rates. They have been supported by the historically observed large flow of labor away from and flow of capital into agriculture. A statistically estimated production function can provide an alternative system of weights for compiling inputs into a "total" input index. For a sector such as agriculture, where the different inputs have had very different time trends, the conventional productivity estimates are quite sensitive to even small shifts in their relative weights.

3. *Economies of scale.* All the conventional productivity indexes assume constant returns to scale. So also do many of the estimated production functions. On the other hand, much of the literature on cost curves, programming, and budgeting implies the existence of substantial economies of scale, both in agriculture and in industry. This whole subject, however, is quite unsettled and controversial. From my point of view, it is not very important whether the economies of scale go on indefinitely or the cost curve finally turns up. The interesting question is whether there were and are *some* additional economies to be had at the existing scale levels. Unfortunately, the fitting of standard Cobb-Douglas production functions, such as I will report on below, is not very well suited to answering this question, since it assumes that the production function is homogeneous of degree greater or less than one, and this may be interesting and valuable, but by its assumption of homogeneity it may miss many aspects of what we usually think of as sources of economies of scale, such as indivisibilities. To study the subject of economies of scale adequately requires the use of a production funct- that is not homogeneous over at least some range of the inputs.

Table IV.1 provides a small sample of the results of a large-scale analysis of data on 1949 average output and input per commercial farm for sixty-eight regions of the United States (based on Census of Agriculture data and other sources). A linear equation is estimated using

TABLE IV.1

ALTERNATIVE ESTIMATES OF THE COEFFICIENTS OF THE
U.S. AGGREGATE AGRICULTURAL PRODUCTION FUNCTION

Input Variable	Estimated from a Cross-Sectional Analysis of 68 Regions in 1949, Coefficients of the Logarithm of the Variables		Official USDA Estimates Based on 1947-49 Factor Shares Adjusted[a] (3)	Coefficients of (1) Adjusted to Sum to Unity[b] (4)
	Excluding Education (1)	Including Education (2)		
Labor	.45 (.07)	.52 (.07)	.40	.33
Real estate	.26 (.03)	.25 (.03)	.13	.19
Power and machinery	.36 (.05)	.32 (.05)	.14	.26
Feed and livestock	.17 (.02)	.14 (.02)	.18	.13
Other	.12 (.03)	.11 (.03)	.15	.09
Education[c]		.43 (.18)		
Sum of coefficients excluding education	1.36	1.35	1.00	1.00
R^2	.977	.979		

NOTE: The numbers in parentheses are the computed standard errors of the coefficients.

[a] Adjusted to a comparable output concept by adding in interfarm sales of feed and livestock.
[b] Column 1 divided by 1.36.
[c] Average weighted school years completed of the rural farm population over 25 years old, weighted by the average income of all U.S. males over 25 in each education class. This is "education per man"; all the other variables are per commercial farm.

the logarithms of all the variables, all expressed in value terms except man-years of labor and education. The use of values rather than quantities may bias the estimates of some of the coefficients. An attempt is being made currently to get around this problem by constructing cross-sectional price indexes (deflators) for all forty-eight states.

The results to date indicate the following: (1) Education as measured is a statistically significant variable with a coefficient that is not much different from the coefficient of the man-years-worked variable. Thus, it turns out, we would not have been very wrong if we had "inflated" the labor variable by our computed "quality" (education) per-man index before estimating the production function. This particular finding makes it easier to apply these results to time series, since one can adjust the labor variable beforehand for quality change rather than carry education along as a separate variable. (2) The estimated coefficient of labor

is relatively smaller and the estimated coefficient of machinery is relatively larger than the official estimates based on factor shares. (3) There is an indication of substantial economies of scale.

If one accepts these findings, they, together with the previously reported work on input quality change, will account for most of if not more than the observed increases in agricultural productivity. Currently, my results will attribute about one-third of the observed productivity change to input quality change, about a quarter to a move toward the elimination of relative disequilibrium due to the overpricing of labor (in particular of family labor) and the underpricing of capital services by the conventional market measures, and the rest to the expansion that occurred in the scale of the average farm enterprise. The last finding is the most tentative one, being subject to many possible sources of bias. To investigate this matter further, I am expanding the analysis to the other post-World War II census years. In particular, it may prove possible to collate the results of the 1959 Census of Agriculture with the 1960 Census of Population, using a much more detailed regional breakdown.

Progress reports on this project were read at the Dublin and Pittsburgh meetings of the Econometric Society. I expect to have the first draft of a monograph ready by the end of this academic year.

ZVI GRILICHES

EXPLORATORY STUDY OF PRODUCTIVITY AND GROWTH

I have been exploring research possibilities in the general field of productivity and economic growth. Because relatively little is known about interplant, intraindustry differences in labor productivity, I began by looking at these differences in United States manufacturing industries. Some preliminary results based on a sample of twenty-one relatively homogeneous, four-digit manufacturing industries in 1958 suggest the following:

1. Value added per employee, which is an available measure of labor productivity, varies considerably among plants in the same industry. When plants are ranked according to this measure, those in the top quarter in most industries show an average level of labor productivity that is more than twice the average for plants in the lowest quarter.

2. Much the same extent of interplant variation appears among different industries. In fact, the differences among industries in 1958 were less than the year-to-year differences in one industry (beet sugar) for which data over a twenty-year span happen to be available.

3. A small part of the interplant differences in labor productivity appears to be related to differences in size of plant.

4. Differences among plants of small size tend to be greater than the differences among plants of large size. This may be because small plants typically have greater product or process specialization, include a greater range of managerial abilities, or are more subject to random factors.

5. Perhaps more significant than size differences are interregional differences in value added per employee within given industries. The geographical pattern varies from industry to industry, but typically value added per employee in the plants in the Pacific division is about 10 per cent above the national average, while that in the South is at least as much below.

Table IV. 2 presents some of the measurements underlying the above statements. The work to date has been suggestive rather than conclusive. It points to some interesting possibilities for further exploration.

VICTOR R. FUCHS

TABLE IV.2

Interquartile Ratios[a] of Plant Value Added Per Employee for Various Sizes of Establishments in Twenty-One Manufacturing Industries, 1958

Industry Code	Title	All Establishments[b] 20 or More Employees	Establishments 20 to 50 Employees	Establishments 50 to 100 Employees	Establishments 100 to 250 Employees	Establishments 250 to 500 Employees	Establishments 500 or More Employees
2011	Meat packing	.684	.863	.733	.568	.413	.434
2026	Fluid milk	.662	.686	.657	.513	.453	.462
2211	Weaving mills, cotton	.645	.627	.932	.657	.662	.592
2392	House-furnishings, n.e.c.	.608	.634	.552	.602	.751	.900
2431	Millwork plants	.662	.700	.637	.549	.379	.550
2511	Wood household furniture —not upholstered	.531	.613	.527	.501	.409	.374
2751	Commercial printing— except letterpress	.522	.556	.465	.508	.282	.443
2752	Commercial printing lithograph	.413	.457	.347	.387	.375	.368
2851	Paints and varnishes	.617	.606	.555	.516	.273	.366
3069	Fabricated rubber products, n.e.c.	.551	.574	.612	.579	.460	.442
3079	Plastics products, n.e.c.	.611	.632	.592	.573	.600	.633
3273	Ready-mixed concrete	.665	.665	.699	.587	.587	[c]
3321	Gray iron foundries	.514	.467	.511	.523	.571	.508
3411	Metal cans	.637	.817	.720	.484	.536	.380
3451	Screw machine products	.515	.535	.501	.461	[d]	[d]
3522	Farm machinery and equipment	.697	.703	.659	.590	.652	.540
3541	Metal-cutting machine tools	.616	.647	.567	.582	.579	.516
3621	Motors and generators	.585	.641	.646	.569	.674	.539
3642	Lighting fixtures	.588	.628	.598	.567	.417	.348
3713	Truck and bus bodies	.577	.611	.501	.609	.452	.231
3811	Scientific instruments	.559	.550	.484	.676	.661	.392
Median		.608	.628	.592	.568	.498	.442

Source: *1958 Census of Manufactures,* Analytical Statistics for Selected Industries, U.S. Bureau of the Census, Washington, 1961, pp. 9-10.

[a] Interquartile ratio $= \dfrac{\text{third quartile} - \text{first quartile}}{\text{second quartile}}$

[b] Plants with fewer than twenty employees were excluded from the analysis because of the unreliability of the data. The excluded plants accounted for 12 per cent of the employment in these industries.

[c] No establishments in the class size.

[d] Figures not disclosed.

ECONOMIC GROWTH OF THE SOVIET UNION

The object of this study, begun in 1954 under a grant from the Rockefeller Foundation, is to set forth and analyze the evidence bearing on the rate of economic growth of the Soviet economy. The work was undertaken in full recognition of the inherent difficulty of arriving at an answer and of the special problems in securing reliable information.

The status of work on individual sectors of the Soviet economy is given below. A summary volume is being prepared, combining the major findings for individual sectors and discussing such other matters as population, employment, construction, and standard of living.

INDUSTRIAL PRODUCTION AND TRANSPORTATION

Two books resulting from this study were published in 1962: *Growth of Industrial Production in the Soviet Union* by G. Warren Nutter, and *Freight Transportation in the Soviet Union* by Ernest W. Williams, Jr. An Occasional Paper, *Small-Scale Industry in the Soviet Union,* by Adam Kaufman, was also issued. *Soviet Statistics of Physical Output of Industrial Commodities: Their Compilation and Quality,* by Gregory Grossman, was published in 1960.

G. WARREN NUTTER

AGRICULTURE: OUTPUT, INPUTS, AND PRODUCTIVITY

The basic objective of the study is to develop satisfactory measures of agricultural output, of the various inputs used in agriculture, and of changes in the productivity of resources for an extended period of time. In addition, measures of the income of the farm population, including estimates of the importance of various sources, have been considered significant as contributing to our knowledge of some of the underlying problems faced by government officials in their efforts to solve the farm problem of the Soviet Union.

The concept of output basic to our study is the output available for sale, home consumption by producers, and additions to inventory. The available official series of output are for two rather different concepts. One is a measure of gross agricultural output, which includes a major amount of double counting; the other is a measure of marketed output which does not include the home consumption of agricultural producers.

In addition to the previous work on estimating output, during the last year we have expanded the commodity coverage of the computed output series. As a by-product of our work, new estimates of the 1913 agricultural output of Russia have been developed which will be used in the construction of the output series.

Simultaneously, a more accurate distribution of the gross output of the various producing sectors has been achieved. Our previous measure, which was based upon the physical output of eleven selected commodities, tended to undervalue the share of private agriculture output for the years after 1955. According to our new series, the percentage distribution of gross agricultural output between the socialized and private sectors for 1953-58 is as follows:

Year	Socialized	Private
1953	60.0	40.0
1954	60.3	39.7
1955	63.6	36.4
1956	62.8	37.2
1957	61.7	38.3
1958	64.5	35.5

We have also made estimates of the distributions of the major inputs between the socialized and private sectors of agriculture. According to official Soviet data, the private sector controls only 3 per cent of the total sown area. We estimate that approximately 35 per cent of all labor time is devoted to the private plots. While no exact estimates are possible, we know that the private plots have very little machinery and almost no draft power. Never-

theless, the average gross labor productivity in the private plots appears to be as great as that on the giant collective and state farms. While it is true that the members of collective farms receive some feed from the collective farms and their livestock graze on public lands, it is also true that nonlabor costs of production are much lower on the private plots than in the socialized sector. Thus it is not unlikely that value added per worker in the private sector is as high as in the socialized sector.

The work on the labor inputs in Soviet agriculture was completed. The measures of this input are satisfactory, given the conditions of the available data.

Progress has been made toward the development of a series of capital stock values for Soviet agriculture. Analysis of the official series of capital stock revealed the need for the construction of independent checks of the official data. A satisfactory check was provided by two series: first, by an agricultural machinery index based upon physical inventory data weighted by alternative price weights; and second, by an index of productive structures in agriculture.

The two additional series did not contradict the aggregate index of productive capital in agriculture at 1955 replacement costs.

The study has now reached the stage where we can integrate the various components. It will be concluded during 1963.

D. Gale Johnson
Douglas Diamond
Arcadius Kahan

OTHER STUDIES

Moses Abramovitz' report, "Evidences of Long Swings in Aggregate Construction Since the Civil War," will shortly go to press. A manuscript by Leo Troy, "A Half Century of Union Membership," is being revised. For a report on a conference on Components and Sources of Output Growth, 1840-1920, to be held September 4-5, 1963, and a conference on Transportation Economics held April 26-27, 1963, see Part III.

Additional reports on studies of economic growth appear in Section 2, below.

2. NATIONAL INCOME, CONSUMPTION, AND CAPITAL FORMATION

CONSUMER PURCHASES PROJECT

An extensively revised manuscript, "Anticipations and Purchases: An Analysis of Consumer Behavior," has been submitted to the Board of Directors. This volume concludes a study of consumer purchase behavior initiated by the Bureau in 1957. The first part of the study was reported in *Consumer Expectations, Plans, and Purchases: A Progress Report*, published in December 1959 as Occasional Paper 70. The study was supported by grants from the Relm Foundation and Consumers Union of the U.S.,

as well as by other funds of the National Bureau.

The basic data were obtained from a sample of 20,000 families who, at the time of the first interview, were member-subscribers to Consumers Union of the U.S., the product testing and rating organization. Surveys were conducted entirely by mail; the first questionnaire was sent out in April 1958 and a follow-up survey mailed six months later.

The major findings and conclusions are as follows:

1. A basic objective of the study is analysis of the relation between consumer intentions to buy durable goods and their subsequent purchases. The sample was divided into a number of subgroups, each of which was sent a different set of questions about buying intentions. For each of thirteen durable goods and for any of the alternative questions, households reporting that they intend to buy (intenders) always show higher purchase rates during the period following the survey than other households (nonintenders); the proportion of intenders in any subsample is systematically related to particular characteristics of the intentions question asked; and the larger the proportion of intenders, given the commodity, the smaller the subsequent purchase rates of both intenders and nonintenders, and the smaller the difference in the purchase rates of the two groups.

The following tabulation shows these relationships for automobiles; responses to six of the alternative questions about buying intentions are arrayed according to the frequencies in column 1:

they "do not intend to buy" are saying that their purchase probability is less than the probability that they attach to the question. Further, the evidence suggests that the distribution of purchase probabilities in the population is continuous rather than discrete, in that consumers are located at every probability level between zero (perfect certainty of nonpurchase) and unity (perfect certainty of purchase), rather than at only two or three places such as high, medium, low, etc.

3. As a consequence, intentions surveys are likely to yield poor predictions of purchases on occasion, though it does not follow that they will necessarily do so. The objective of a survey is to predict the population purchase rate in the future. The best estimate of the future purchase rate is clearly mean purchase probability at present. But existing surveys of buying intentions show only the proportion of households with purchase probabilities high enough to report intentions, and there is no reason to suppose that mean probability is uniquely related to this proportion.

Intenders Per 100 Respondents, Alternative Intentions Questions (1)	Purchasers Per 100 Respondents (2)	Purchasers Per 100		Simple Correlation Between Intentions and Purchases (5)
		Intenders (3)	Nonintenders (4)	
8	33	76	30	+.266
11	33	73	28	+.294
23	35	66	25	+.359
24	33	59	25	+.310
31	33	55	23	+.313
44	35	53	20	+.313

2. These findings suggest that responses to survey questions about buying intentions are essentially statements about purchase probability. Consumers reporting that they "intend to buy a car" are simply saying that their probability of purchasing a car is greater than some (unknown) probability that depends, in part, on the particular intentions question asked; correspondingly, those reporting that

4. It follows that predictions of durable goods purchases can be materially improved by an extensive redesigning of buying intentions surveys. Concretely, the data show (as illustrated by column 5 in the above tabulation) that at least one completely experimental survey question is consistently better in picking out prospective buyers and nonbuyers of automobiles, furniture, and appliances from a

sample of households than any of the intentions questions currently in use. And the evidence suggests a strong possibility that surveys designed to obtain explicit probability judgments from respondents, though as yet untested, will prove to be even better.

5. In general, consumers purchasing one durable good are more likely than others to purchase additional durables, while those not buying a particular durable are less likely to purchase other durables. This finding illuminates the well-known fact that fluctuations in the consumer durables sector are one of the key elements in business cycle analysis.

6. The monograph examines the relation between consumer attitudes and their subsequent purchases of durables. The findings suggest the possibility that only changes regarded by the respondent as extreme have an influence on consumer spending. In one subsample of 5,000 reinterviewed households, for example, about 4,000 reported only moderate changes in income or general business conditions. There were no systematic differences in subsequent durable goods purchases among these 4,000 households, although they ranged from those reporting persistently adverse changes to those reporting persistently favorable ones. In the remaining group, in contrast, not only were there sharp differences in purchase rates between extreme optimists and pessimists, but there were also noticeable differences among both the very optimistic and the very pessimistic households.

7. There is a good deal of evidence to suggest that predictions based on survey questions that ask respondents to make judgments about how their purchase decisions will be influenced by a combination of underlying factors are likely to be more accurate than predictions based on any statistical combination of the underlying factors themselves. For example, differences in purchase rates among households are predicted much more accurately from responses to the question "Is this a good or bad time for your household to buy durables?" than from a set of responses to specific questions dealing with the household's assets, debts, in-

come, expected income, and so forth. The reason is, presumably, that individual households are best able to decide on the appropriate weight for each of the underlying factors, and the appropriate weights vary widely with the particular circumstances of each household.

8. The advantage of these "judgment" questions is most clearly evidenced by the results of an extensive statistical analysis of differences in purchases among households. Of some twenty-odd survey questions, responses to "Do you intend to buy any of the following durables?" and "Is this a good or bad time for your household to buy durables?" turned out to have by far the strongest relation to subsequent purchases. Responses to these two questions explained (statistically) about 15 per cent of the total variance in purchases, while responses to the remaining questions explained only an additional 5 per cent of the variance. The variables examined in the analysis included, among others, current family income, assets and debts, changes in income, liquid asset and debt position prior to the survey, housing purchases, expected changes in family income and in general business conditions, and the household's long-term financial outlook. Aside from the two judgment questions, family income level and housing purchases showed the strongest relation to purchases.

F. Thomas Juster

INVESTMENT IN EDUCATION

This project, financed by grants from the Carnegie Corporation of New York, is concerned with the effects of investment in human capital, especially in education, on earnings and productivity. A set of papers presented at a conference partially financed by the project was recently published as a special supplement to the October 1962 issue of the *Journal of Political Economy,* entitled *Investment in Human Beings.* Papers by Jacob Mincer and myself were directly supported by the project.

I have almost finished the draft of a manuscript. The first section is a slight expansion

of my paper in the conference volume just mentioned. The second section deals with the effects of education on the shape of age-earnings and age-worth profiles (i.e., the relations between age and earnings, and age and the present value of future earnings). The final section presents estimates of money rates of return to various education cohorts in the United States. Rates of return are separately estimated for several recent cohorts of white male graduates of high schools and colleges. In addition, some attention is paid to the benefits received from education by nonwhite males, all females, rural persons, college and high school dropouts, and to the secular trends in these benefits. I also discuss the effect of the well-known correlation between "ability" and education on the relation between education and earnings. Finally, comparisons are made between rates of investment in education and nonhuman capital and rates of return on these investments. A brief preliminary version of some of these results was published in the May 1960 issue of the *American Economic Review,* and has recently been reprinted in *The Goal of Economic Growth,* edited by E. S. Phelps.

Albert Fishlow of the University of California joined the project in February for a year to take charge of work on historical trends in education in the United States. His study is expected to provide historical perspective on the development of an educated labor force in the United States, and this perspective in turn to assist in bettering our understanding of the relation between education and economic growth.

GARY S. BECKER

THE IMPACT OF PUBLIC AND PRIVATE PENSION SYSTEMS ON SAVING AND INVESTMENT

The basic research for this project, supported by a major grant from the Maurice and Laura Falk Foundation and by a supplemental grant from the Life Insurance Association of America, has been substantially completed. Various portions of the final report and study papers have been drafted. The major areas covered include (1) the structure and growth of public and private pension programs, (2) the impact of pension benefits and accumulations on saving, and (3) the impact of pension fund operations on the capital market.

Some of the results of the project are described in Part II. The following report by Daniel M. Holland presents the preliminary results of his work in developing a series of projections of the volume of private pension programs for 1960-80.

ROGER F. MURRAY

PROJECTIONS OF PRIVATE PENSION PLANS, 1960-80

A manuscript has now been completed and sent to the advisory committee for critical review and suggestions.

The estimates are tentative at best and subject to wide, but unspecifiable, margins of error. The results of the projections are discussed under four categories: number of beneficiaries, number of covered workers, level of reserves, and net changes in reserves.

BENEFICIARIES

We consider our estimate of the number of people who will receive benefit payments from private industrial pension plans quite good and from state and local government plans rather good. In both projections, we had a solid base to start with because, over the next generation, beneficiaries will be made up of current annuitants and covered workers 45 and older who survive.

The estimates appear in Table IV.3 and require little elaboration. They show, of course, great growth over the twenty-year period under review—from 2.3 million to 7.5 million. To place these numbers in perspective, we may relate them to the population 65 and over. We

TABLE IV.3

NUMBER OF BENEFICIARIES UNDER
PRIVATE PENSION PLANS,
PROJECTIONS THROUGH 1979

(thousands)

End of Year	Private Industrial	State and Local	Total
1960	1,780	1,215	2,310
1964	2,525	530	3,171
1969	3,614	646	4,437
1974	4,941	823	5,952
1979	6,314	1,011	7,529

expect a relative growth in the pension "elite" —those who will receive a private plan pension supplementary to OASDI—their proportion rising from its current 15 per cent of those 65 years of age and older to 31 per cent by the end of 1979.

COVERAGE

Our judgments on the course of coverage are of necessity less firm than our projections of beneficiaries. For both private industrial and state and local plans we made three coverage assumptions: low, medium, and high. It is hard to choose among them; we therefore present all three possibilities in Table IV. 4. Clearly, under any of the three assumptions, there will be an enormous growth in coverage of the private pension structure over the next twenty years; loosely, we can say that coverage will double over this period. To focus these projections of coverage, we relate them to estimates of the number of employees "potentially eligible" for pension coverage (in this case, of course, potentially eligible for both private industrial and state and local pension plans). The results are summarized in Table IV.5. Choosing the middle assumption to illustrate the point, it appears that by 1980 most of those who could really be expected to be covered by private pension plans will indeed be covered. About 75 per cent would seem to be a reasonably conservative guess.

TABLE IV.4

ESTIMATED COVERAGE OF PRIVATE INDUSTRIAL AND STATE AND LOCAL PENSION PLANS
UNDER THREE COVERAGE ASSUMPTIONS, SELECTED YEARS

(millions)

	COVERAGE ASSUMPTION								
	Low			Medium			High		
END OF YEAR	In-dustrial	State and Local	Total	In-dustrial	State and Local	Total	In-dustrial	State and Local	Total
1959	20.2	4.4	24.6	20.2	4.4	24.6	20.2	4.4	24.6
1964	26.6	4.9	31.5	27.1	5.1	32.2	27.3	5.3	32.6
1969	31.1	5.2	36.3	33.0	5.7	38.7	34.3	6.2	40.5
1974	34.5	5.5	40.0	37.9	6.3	44.2	40.6	7.0	47.6
1979	38.1	5.8	43.9	41.1	6.9	48.0	46.1	7.9	54.0

TABLE IV.5

ESTIMATES OF PERCENTAGE OF "EMPLOYEES POTENTIALLY ELIGIBLE"
COVERED BY PRIVATE PENSIONS, THREE ASSUMPTIONS, SELECTED DATES

(millions)

Year	Potentially Eligible Assumption			Coverage Assumption			Coverage Percentage Assumption		
	I	II	III	I	II	III	I	II	III
1959	36.0	36.0	36.0	24.6	24.6	24.6	68.3	68.3	68.3
1964	45.6	45.8	46.1	31.5	32.2	32.6	69.1	70.3	70.7
1969	50.1	50.7	51.3	36.3	38.7	40.5	72.5	76.3	78.9
1974	55.1	56.0	56.8	40.0	44.2	47.6	72.6	78.9	83.8
1979	60.5	61.8	63.0	43.9	48.0	54.0	72.6	77.7	85.7

I = low, II = medium, III = high.

The high percentages in Table IV. 5, and the relatively low percentages for the pension "elite" noted earlier, are explained by and serve to remind us of two salient features of private arrangements.

1. The right to such a pension comes not merely from coverage but from sufficient length of service. Because women are frequently in and out of the employed population, they count for proportionately more in the estimate of coverage than in the estimate of beneficiaries.

2. In the dynamics of pension plans, beneficiaries and benefits perforce lag behind covered workers and contributions. So, although by 1980 most workers will be covered, it is only those who were at least 45 in 1960 and are still alive (and also have met vesting requirements) who will be receiving benefits in 1980.

RESERVES

Reserves are the main interest of this study. We have put together the projections of reserves for private industrial pensions and state and local plans. We could, of course, have summed up the pension structure with any one of many possible combinations of projections for each of these two sectors. However, our summary purpose is adequately served by adding up what is, in our judgment, the most likely estimate for each sector. The results appear in Table IV.6. Over the twenty years between 1959 and 1979, we expect these reserves to increase fivefold, that is, from $61 to over $300 billion. The reader is reminded that the potential margin of error in these estimates increases greatly as the projections are extended beyond 1969, and he should view the findings in this light.

TABLE IV.6

PROJECTED RESERVES OF PRIVATE INDUSTRIAL AND STATE AND LOCAL PENSION PLANS, SELECTED DATES, 1959-79

(billion dollars)

Year[a]	Private Industrial	State and Local	Total
1959	44.8	16.5	61.3
1964	76.7	27.9	104.6
1969	118.0	42.4	160.4
1974	167.2	60.2	227.4
1979	222.8	81.9	304.7

[a] For industrial plans, reserves are as of the end of the calendar year; for state and local plans, reserves are as of the end of the fiscal year, which typically ends June 30.

ANNUAL NET CHANGE IN RESERVES

Given the wide diversity in estimates of annual additions to reserves that appears in our various projections, there is not much point in formally laying out in tabular form our expectations (projections) for the rate at which the private pension system will accumulate assets. But some broad generalizations are, nonetheless, possible. Through 1970 or so, there is substantial agreement among our projections that the private industrial pension system will, on net balance, add annually to its assets at a rate increasing from $5.6 billion in 1960 to about $9.5 billion by 1970, and state and local pension plans over the same period will be accumulating annually amounts that increase from $2.2 to $3.5 billion. The annual amount of increase in reserves thus should almost double by 1970, to just about $13 billion. Over the ensuing ten years, the possibilities are more diverse. The increase in the annual net accumulation will tend to slow down, but this means that in 1980 the private pension system will still be accumulating—indeed, in absolute amounts greater than ever before. One not wholly unreasonable conjecture is that reserves will increase by close to $16 billion annually by the end of the period under review.

I plan next to put together my findings on trends in characteristics of private industrial pension plans, the main data for this purpose being the vesting provisions and benefit patterns observed over a decade in the pension plans of a sample of 124 large companies.

DANIEL M. HOLLAND

THE CHANGING POSITION OF PHILANTHROPY IN THE AMERICAN ECONOMY

The work in residence at the National Bureau by Natalie Naylor, Ralph L. Nelson, and myself came to a close in August 1962. At that time some work had been done on all the chapters of our prospective report and on three special topics.

As stated in last year's Annual Report, the study is being organized around the "four quadrants of philanthropy": (I) private domestic philanthropy, (II) private foreign philanthropy, (III) public domestic philanthropy, and (IV) public foreign philanthropy. Tentative titles of the ten chapters are as follows:

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1. Introduction

These chapter titles may not indicate the amount of emphasis on private domestic philanthropy. Moreover, a decision was reached to have Nelson investigate three areas in Quadrant I—religious giving, corporate giving, and family giving. He has completed the first draft on religious giving and is working on a revision of his draft on corporate giving (reported on below).

I accepted a position as professor of economics at Northern Illinois University in DeKalb in mid-1962. During the remainder of the year 1963 I hope to complete the balance of the manuscript. Although appropriate comments will be made in each chapter concerning differences of opinion on our broad concept of philanthropy, only in the last chapter will consolidations be presented with and without the subtotals for some of the controversial items in the various quadrants.

The broad conclusions are shaping up along the lines stated in last year's Annual Report.

In December, *Philanthropy and Public Policy,* a report on the Conference on Philanthropy held at the Merrill Center for Economics in June and July of 1961, was published.

FRANK G. DICKINSON

ESTIMATES OF CORPORATE GIVING

In the past year much of my attention has been on giving by corporations. Though accounting for a relatively small share of total philanthropy, corporate giving has been one of the more rapidly growing components. In the late 1930's it accounted for between 2 and 2.5 per cent of the total; by the mid-1950's it averaged about 5 per cent. By the end of the 1950's almost two-fifths of corporate contributions were going to higher education; ten years earlier the amount was less than one-fifth. In the academic year 1960-61, about one-sixth of all private philanthropic support of higher education was coming from business corporations.

In absolute amount, corporate giving rose from an annual average of about $30 million in the late 1930's to $425 million in the late 1950's. This very large increase reflected not only the increase in corporate income but also the increased share of income given. In the late 1930's, giving as a percentage of corporate before-tax income ranged between 0.39 and 0.66. In the late 1950's, two decades later, the percentage ranged from 0.87 to 1.01. These comparisons are based on tax returns from all corporations, those showing losses as well as those showing profits. As there were relatively greater and more widespread losses in the base period of the 1930's than in the more prosperous 1950's, the secular rise in giving percentage may be understated. When only corporations with profits are examined, their giving percentage rises from a 1936-40 range of 0.28 to 0.35 to a 1955-59 range of 0.81 to 0.91, a much sharper rise. Both periods were unencumbered by the complications of wartime and the presence of the excess-profits tax.

Movements in giving tended to match those in income, though the conformity was not perfect. Of the twenty-three year-to-year changes from 1936 to 1959, in seventeen cases income and giving moved in the same direction and in six they moved in opposite directions. As to degree of movement, giving behaved in a much less volatile fashion than income. Of the twenty-three year-to-year movements in income, the percentage of income given moved in an oppo-

site direction from income in fifteen instances. In two cases (1954-55 and 1958-59) it showed a barely perceptible rise in response to a sharp rise in income. In six cases (1936-37, 1941-42, 1942-43, 1950-51, 1952-53, and 1953-54) the movement clearly did not conform to the usual pattern.

Most of the departures from the usual pattern can be related to changes in corporate income tax rates and levies. The concurrent 1941-42 rise in income and percentage of income given, for example, occurred when there were sharp rises in normal and excess-profits tax rates. Taxes took 51.0 per cent of 1942 corporate income compared with 39.6 per cent in 1941.

Excess-profits tax considerations were probably important in the establishment of company-sponsored foundations. Of 1,227 of the largest in 1958 listed in the *Foundation Directory*, about 60 per cent were organized in 1949-54, and many of these received substantial endowments. Not only is an appreciable fraction of corporation giving now channeled through company-sponsored foundations but their endowment position permits many of the sponsoring companies considerably more freedom in the timing of contributions to their foundations. From this one may infer that future swings in corporate giving will be somewhat greater than in the past.

A more extensive correlation analysis of some of these relationships is nearing completion. This includes an attempt to determine how much of the observed rise in percentage of income given can be attributed to increases in tax rates and how much to changes in what corporations regard as an appropriate level of giving. Cross-sectional analyses have also been made in an attempt to relate corporate giving to such factors as profitability, size, and employment.

RALPH L. NELSON

STUDIES IN THE NATIONAL BALANCE SHEET OF THE UNITED STATES

The manuscript of *Studies in the National Balance Sheet of the United States,* Volume I, is in press. An introduction describing the coverage and sector definitions of the National Bureau's estimates and reconciling them with those of the Federal Reserve Board has been added to Volume II, which contains the basic data underlying Volume I and also those used in Goldsmith's *Flow of Capital Funds in the Postwar Economy.* Volume II has also gone to press.

RAYMOND W. GOLDSMITH
ROBERT E. LIPSEY

OTHER STUDIES

Capital and Rates of Return in Manufacturing Industries, by George J. Stigler, will be published soon. Among the reports soon to go to press are "The Flow of Capital Funds in the Postwar Economy," by Raymond W. Goldsmith; "Business and Professional Income Under the Income Tax," by C. Harry Kahn; and two conference proceedings, "Income Shares" and "Models of Income Determination." Plans for a conference on the Industrial Composition of Income and Product are being prepared (see Part III).

3. BUSINESS CYCLES

MONEY AND BANKING

A Monetary History of the United States, 1867-1960, now in press, presents the historical background of changes in the money stock.

The statistical analysis of the behavior of money is the subject of a companion study, to be submitted to the Board of Directors later this year. Milton Friedman's *The Interpolation of Time Series by Related Series,* Technical Paper 16,

published earlier this year, was a by-product of the money study, since numerous problems of interpolation arose in the construction of the estimates of the money stock since 1867. Phillip Cagan's monograph, "Determinants and Effects of Changes in the U.S. Money Stock, 1875-1955," has been submitted to the Board of Directors for review.

Historical and statistical findings drawn from our own work, that of Phillip Cagan, and of Milton Friedman and David Meiselman served as the point of departure for a paper, "Money and Business Cycles," presented by us in April 1962 to the Universities-National Bureau Committee for Economic Research Conference on Monetary Economics, and published in a Supplement to the February 1963 issue of the *Review of Economics and Statistics.*

The statistical evidence indicates that the stock of money displays a consistent cyclical behavior that is closely related to the cyclical behavior of the economy at large. The evidence may be summarized as follows:

1. The only major exceptions since 1867 to the tendency of the money stock to rise during both cyclical expansions and cyclical contractions occurred in contractions judged by other indicators to be deep depressions (1873-79, 1892-94, 1907-8, 1920-21, 1929-33, 1937-38). For deep depression cycles, the reference patterns show a rise during expansions and a fall during contractions, quite unlike patterns for mild depression cycles, which rise almost in a straight line. In its behavior during mild cycles, the money stock is like other series with a sharp upward trend—the cycle shows up not in an absolute rise and fall but in different rates of rise.

2. To eliminate the strong upward trend, we convert the absolute level of the stock of money to the percentage rate of change from one month to the next. The reference cycle patterns for this series show a clear rise and fall, the peak rate of change occurring early in expansions and the trough early in contractions, and with mild and deep depression cycles distinguished primarily by their amplitude.

3. Evidence on cyclical timing derived from a comparison of turning points, because it has so few turning points, is clearly not available from the stock-of-money series. The rate of change in the money stock, however, regularly reaches a peak before the reference peak and a trough before the reference trough, though the lead is somewhat variable.

4. The amplitude of the cyclical movement in the rate of change in money is closely correlated with the amplitude of the cyclical movement in general business and is about half as large as the amplitude of cyclical movements in money income.

5. The velocity of money—the ratio of income to the stock of money—has fallen over the whole of the ninety-odd-year period covered by our data, despite its rising trend in the post-World War II period. As a result, velocity has frequently declined during both expansions and contractions in general business. When that decline has not occurred, velocity has conformed positively to the cycle, rising during expansions and falling during contractions. When that decline has occurred, the cyclical effect has shown up in a slower rate of decline in expansions than in contractions.

The cyclical pattern in velocity can be largely though not wholly accounted for by the supposition that the amount of money demanded in real terms is linked not to current income and prices, as measured by statisticians, but to longer-term concepts of permanent income and permanent prices. This interpretation suggests that the amount of money demanded rises during the expansion phase of a cycle in a greater proportion than permanent income, and so is consistent with the secular decline in velocity; however, measured income rises in a still greater proportion, so that measured income rises relative to the stock of money. Conversely, during the contraction phase the amount of money demanded falls in a greater proportion than permanent income; however, measured income falls in a still greater proportion, so that measured income falls relative to the stock of money.

6. Even more controversial than the suggested explanation of the cyclical behavior of velocity is the view, implicit in the explanation, that velocity plays an independent role in cyclical change. Cycle theories that regard investment as the dominant cycle-producing factor take it for granted that an expansion of investment will produce an expansion in income regardless of what happens to the money stock, and that the magnitude of the expansion in income is independent of the size of any concurrent change in the money stock. If the money stock does not rise, then velocity will simply rise to fill the gap; if the money stock does rise, velocity will not rise as much or may even fall. The assumption that the rate of cyclical expansion or contraction can be regarded as fairly rigidly linked to the rise or fall in investment or autonomous expenditure, and that this link is independent of the contemporary behavior of the money stock, is not borne out by the statistical evidence. It shows the stock of money to be much more closely and systematically related to income over business cycles than investment or autonomous expenditures. The evidence therefore offers no support for the view that velocity is passive.

The most convincing evidence in support of the view that money plays an independent role in cyclical changes is the historical evidence we have assembled on the circumstances underlying the changes that occurred in the stock of money. We distinguish changes in the stock in major and minor economic fluctuations. Major movements include the deep depressions listed above, wartime inflations (1914-20, 1939-48), and a few long-continued movements in one direction (such as the generally rising level of money income and prices from 1896 to 1913). Minor economic fluctuations are mild depression cycles. As to major movements, the historical record justifies two important generalizations:

1. There is a one-to-one relation between monetary changes and changes in money income and prices. Changes in money income and prices have, in every case, been accompanied by a change in the rate of growth of the money stock, in the same direction and of appreciable magnitude, and there are no comparable disturbances in the rate of growth of the money stock unaccompanied by changes in money income and prices. Thus appreciable changes in the rate of growth of the money stock appear to be a necessary and sufficient condition for appreciable changes in the rate of growth of money income. This is true both for long secular changes and also for changes over periods roughly the length of business cycles.

2. Monetary changes have frequently been autonomous. The changes in the stock of money have been attributable to a variety of sources —including international gold flows and Treasury or Federal Reserve policy (which affect high-powered money), and the deposit-reserve and deposit-currency ratios—many of which are linked directly neither to contemporary business developments nor to earlier business developments which themselves can be regarded as determining the contemporary course of business.

As to minor economic fluctuations, the evidence does not preclude a link between contemporary cyclical changes in money income and prices and changes in the stock of money. For example, the most important single contributor to the cyclical fluctuations in the rate of change in the money stock, viewed from the supply side, is the deposit-currency ratio, which reflects the public's decisions about the proportion in which it divides its money balances between currency and deposits. That ratio is an important link in the feedback mechanism whereby changes in business effect the stock of money. Nevertheless, if it is plausible to suppose that changes in the stock of money played an important independent role in minor movements, the reason is that the evidence for minor movements does not stand alone. The minor movements can be interpreted as less virulent members of the same species as major movements.

We conclude that both the statistical and historical evidence supports the proposition that there is a significant influence running from money to business, in the sense that it can account for a substantial fraction of the

fluctuations in economic activity. The reflex influence of business on money, the existence of which is not in doubt, can be interpreted as part of the mechanism, itself partly self-generating, whereby monetary disturbances are transmitted to the economy.

The transmission mechanism in the diffusion of a change in the rate of change of money involves balance sheet adjustments of the structure of actual assets held by individuals and firms to bring it into accord with a structure of assets they desire to hold. They adjust their stocks of assets by changes in flows, spending more or less than they would in the absence of the monetary change, with ultimate effects on the creation of new financial assets and on the demand for existing nonfinancial assets and for the services of factors of production for current goods and services.

It is the interconnection of stocks and flows that stretches the effects of shocks out in time, produces a diffusion over different economic categories, and gives rise to cyclical reaction mechanisms. The stocks serve as buffers or shock absorbers that absorb initial changes in rates of flow, by expanding or contracting from their "normal" or "desired" state, and then slowly alter other flows as holders try to regain that state.

In this stock-flow view, money is a stock in a structure of assets, like the stock of financial assets, houses, buildings, inventories, or skills. It yields a flow of services like these other assets; it is also subject to increase or decrease through inflows and outflows, also like those other assets. It is because our thinking has increasingly moved in this direction that it has become natural for us to regard the rate of change in the stock of money as comparable to income flows, and changes in the rate of change as a generating force in producing cyclical fluctuations in economic activity.

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MILTON FRIEDMAN
ANNA J. SCHWARTZ

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COSTS AND PROFITS

MEASURING PRODUCTION

Work on cost per unit of product involves the use and therefore the appraisal of production measures. For one thing, production aggregates should be comparable with cost aggregates. The aggregate data on total cost (labor, materials, transportation, utility services, depreciation, indirect taxes, and so on) in each of the fifteen manufacturing industries studied refer to the goods sold during the quarterly accounting period by corporations in the industry. The measure of production in each case should refer to the production sold by those corporations during the same accounting period. To measure output we have, therefore, used sales of those corporations, deflated by the most appropriate available price index.

The aggregate labor cost data, on the other hand, refer to labor performed during each period of time, regardless of whether the product of that labor was sold during the period or left in inventory at the end. The data also include labor in the noncorporate part of manufacturing, which, however, is small. The quantity of goods sold during the period includes some goods on which work had been performed in an earlier period, and excludes goods on which some work was currently performed but which were left in inventory. To divide labor expense by corporate quantity sold, therefore, involves some inaccuracy.

The Federal Reserve indexes of production in the various industries, on the contrary, are designed to measure all production, sold or unsold, corporate or noncorporate. They would, therefore, seem more appropriate for use in conjunction with the labor data. But in many instances they are based on man-hours and monthly indexes of product per man-hour, often called productivity. The monthly indexes are obtained from annual indexes. Study of the interpolating procedure showed that it usually implies a continuous rise, or a continuous fall, for half a year or a full year. Since output per

man-hour, or its reciprocal, man-hours per unit of product, is a major factor in manufacturing cost, measures of output based on productivity interpolations are not suitable for use in the study of short-run fluctuations in cost. The annual data are not suitable because the unit of time is too coarse. For these reasons, we originally used deflated sales in spite of the inventory and noncorporate complications.

In four industries, however, the Federal Reserve index is based directly on physical data for production. In the other eleven, comparison of the annual Reserve indexes with annual averages of the deflated sales indexes provides some check on the latter, although the annual Reserve indexes in these industries are themselves based in varying degrees on price inflation. Extensive comparisons of the annual figures were made. To obtain a quarterly index with the general trend of the Reserve index, we interpolated the annual Reserve indexes by the deflated sales indexes. An alternative set of calculations of hours per unit, labor cost per unit, and total cost per unit was made, using quarterly averages of the Reserve index in the four industries, and deflated sales adjusted to the Reserve annual level in the eleven, as denominators. Naturally, the new set of figures is not identical with the old, but it does not upset our general conclusions on cost. Either set indicates that total cost per unit rises more often in contractions than in expansions of output, that man-hours per unit and labor cost per unit fluctuate inversely with output, and that the inverse relation is more pronounced in the early than in the late stages of a production upswing or downswing. The second set of production measures was finally used in conjunction with the labor data.

REVISED LABOR DATA

After the last draft of the manuscript on "Costs, Prices, and Profits: Their Cyclical Relations" was written, the Bureau of Labor Statistics published revised data on employment, hours, and earnings in manufacturing, covering the entire period of our labor cost work, which begins in the first quarter of 1947. New quarterly figures on hours per unit and labor cost per unit, using the revised BLS figures, were computed and analyzed for each of the fifteen industries. The new labor data, like the alternative production measures, did not upset our broad conclusions.

RECENT CHANGES IN COSTS AND PROFITS

We brought our manufacturing data as nearly up to date as possible, which enabled us to observe a new group of downswings in production, corresponding to the 1960-61 business contraction. Twelve industries had downswings corresponding to that contraction, although the peak and trough dates in an industry's output did not always coincide with those assigned to business at large. During their own downswings, total cost per unit rose in ten of the twelve, hours per unit rose in nine, labor cost per unit in ten. Profit margins fell in eleven.

From the trough in each industry to the latest date for which we have information, i.e., during the earlier quarters of the current recovery, total cost per unit fell in eight of the twelve industries, man-hours per unit in all, labor cost per unit in nine. Profit margins rose in nine.

We have also brought our data on railroads and public utilities up to date. Hours per unit of traffic had a slight net fall in the contraction of traffic that ended in the fourth quarter of 1960, but labor and total cost per unit rose. From that quarter to the same quarter of 1961, the expansion of traffic was accompanied by the cost and profit changes that our past studies would lead us to expect. Man-hours per traffic unit fell 9.8 per cent, labor cost per unit 8.8 per cent, total cost per unit 7.0 per cent. The percentage ratio of net revenue after operating expenses to revenue rose from 19.9 to 23.4, that of net income before taxes from 3.8 to 8.2.

NEW DIRECTIONS

The study shows, among other things, that shifts in demand play an important part in profit changes. We initiated an effort to learn more about these shifts in one large area of expenditure, namely, outlays for transportation plant and equipment.

THOR HULTGREN

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PROFITS, CAPITAL APPROPRIATIONS, AND INVESTMENT EXPENDITURES

During the spring and summer of the past year, I collaborated with Howard Sherman of the California Institute of Technology on a study of the relation between profits, capital appropriations, and investment expenditures of manufacturing industries. The data studied are National Industrial Conference Board statistics for plant and equipment appropriations, cancellations of appropriations, and expenditures as reported by 602 industrial concerns; and corporate profits as published by the Federal Trade and Securities and Exchange Commissions. Data are classified by industry group. The preliminary results of this study were presented in a paper at the meetings of the American Statistical Association in September.

Use of the Conference Board data permitted study of the investment decision insofar as it is reflected in appropriations, noting the relation of appropriations to profits and expenditures. It was found that there was a fairly high conformity between profits and appropriations with coincident or slightly lagged timing of appropriations behind profits. Expenditures show a variable lag of several months behind appropriations and profits.

Recently, estimates of appropriations backlogs have been prepared for each industry group. Present plans call for analysis of the relation between these backlogs, new appropriations, and investment expenditures. Attention may also be given to the relation between cash flow, current levels of capacity operation, and appropriations. Analysis and preparation of a manuscript will take place during the remainder of the academic year.

THOMAS M. STANBACK, JR.

ORDERS AND PRODUCTION IN MANUFACTURING INDUSTRIES: A CYCLICAL ANALYSIS

The substantive chapters of the manuscript have been drafted and edited. The introductory and summary chapters and the appendix materials are in preparation.

Much of my recent effort was devoted to the part on investment orders and expenditures, now consisting of two new chapters (7 and 8): "Manufacturers' Orders and Investment in Plant and Equipment," and "Manufacturers' Orders and Inventory Investment." The former discusses the derivation and properties of estimates of new investment orders and contracts. The predictive value of this series is compared with that of other data that are designed to foreshadow business plant and equipment expenditures, such as the SEC-Commerce "first anticipations" and the NICB new capital appropriations in manufacturing. Both cyclical timing analysis and regression analysis are used. The anticipatory series are tested singly and in various combinations with "causal" determinants. (The former variables are in general considerably superior to the latter in forecasting capital outlays.) The correlations obtained with investment orders are high (R^2 between .90 and .92), but those with first anticipations are still higher (R^2 between .97 and .98) and they yield lower standard errors of estimate. However, investment orders provide the earlier forecasts: they predict the outlays best with a two-quarter lead, but almost as well with a three-quarter lead. They have also an advantage in the detection of turning points in fixed-investment expenditures. The predictive range of first anticipations is very short.

The causal factors suggested by the theory of the demand for capital goods refer to investment decisions, not realizations; hence they are more applicable to the early stage of the process, such as the placement of orders and contracts, than to the late stage of expenditures. Forecasts of plant and equipment orders also clearly have an advantage of timeliness over forecasts of the corresponding capital outlays; the latter could be derived from the former, with appropriate lags being used to combine them. Regressions of investment orders on selected variables, such as final sales, sales change, corporate cash flow or profits, and so on, have been computed for the period 1949-61, using quarterly data and simple or dis-

TABLE IV.7

SUMMARY MEASURES OF CYCLICAL CONFORMITY, TIMING, AND AMPLITUDE,
NEW ORDERS AND SHIPMENTS OF CONSUMER GOODS, MATERIALS, AND EQUIPMENT, 1948-61

| | Consumer Goods (C) | | Materials (M) | | Equipment (E) | |
| | Including Motor Vehicles[a] | Excluding Motor Vehicles[b] | Durable and Nondurable[c] | Durable Only[d] | Including Farm and Defense[e] | Predomi- nantly Business Nonfarm[f] |
	(1)	(2)	(3)	(4)	(5)	(6)
COMPARISONS OF COMPONENT SERIES IN EACH GROUP						
Number of industries in group	4	3	12	9	14	10
Number of shipment turns						
Covered	28	20	95	72	104	76
Matched	28	20	95	72	98	74
Leads of orders at shipment turns						
Number	14	10	65	48	76	58
Percentage of turns matched	50	50	68	67	78	78
Average lead (−) or lag (+)						
(months)	−1.3	−1.0	−2.5	−2.5	−4.6	−4.8
Number of business cycle turns						
Covered	27	21	83	60	102	76
Matched	23	17	81	60	95	73
Leads of orders at business cycle turns						
Number	18	14	72	54	80	62
Percentage of turns matched	78	82	89	90	84	85
Average lead (−) or lag (+)						
(months)	−5.9	−6.6	−5.9	−5.8	−5.5	−4.9
COMPARISONS OF GROUP AGGREGATES						
Average lead (−) or lag (+) of orders (months)						
At turns in shipments	−2.3	−0.7	−2.1	−2.9	−5.3	−3.4
At business cycle turns	−3.7	−3.3	−4.2	−4.4	−5.8	−4.1
Average relative amplitude of cyclical movements (per cent)[g]						
New orders	46.4	48.2	34.8	44.1	58.6	61.2
Shipments	32.5	33.0	27.7	34.6	32.1	33.0
Ratio of amplitudes						
Shipments/new orders	0.70	0.68	0.80	0.78	0.55	0.54

SOURCE: U.S. Department of Commerce, Office of Business Economics.

[a] Includes the following industries: motor vehicles; household appliances; radio, TV, and equipment; and furniture.

[b] Includes the industries listed in note a, except motor vehicles.

[c] Includes primary metals (three industries); fabricated metal products (three); motor vehicle parts and accessories; lumber; stone, clay, and glass products in the durable group, and textiles, leather, and paper in the nondurables.

[d] Includes durables group the industries listed in note c.

[e] Includes industrial machinery (three industries); engines and turbines; construction machinery; office and store machines; other nonelectrical machinery; electrical generator apparatus; other electrical equipment; non-automotive transportation equipment other than aircraft. Also, aircraft, agricultural machinery, professional and scientific instruments, and miscellaneous including ordnance.

[f] Includes the industries listed in the first sentence of note e.

[g] For each successive expansion and contraction in the given series, the amplitude was measured between the average standings of the series in the three-month period centered on the initial and terminal turns. All amplitudes were expressed in percentages of the initial-turn levels. The averages of the expansion and contraction amplitudes were taken without regard to sign.

tributed lags; they yield R^2 coefficients between .86 and .91. The quality of these results is sufficiently good to hold out promise for this approach.

Measures of timing of orders at business cycle as well as sales turns have been extended to include thirty-one industrial subdivisions of the Department of Commerce series for the periods covered between 1948 and 1961. They confirm and amplify the main findings of my previous work with data for individual industries or products and with comprehensive series for the major manufacturing industries. An interesting distinction which the new data enabled me to make is between groups of industries representing primarily production of consumer durable goods (C), materials (M), and equipment (E). Table IV. 7 shows that leads of new orders relative to shipments averaged only one month for the consumer goods, two and a half months for materials, and nearly five months for equipment. Of the shipment turns covered, all but a few can be matched with new order turns in each group. The percentage of matched peaks and troughs at which orders led varied from 50 (in group C) to 78 (in group E). These results reflect the fact that many capital goods, such as industrial or construction machinery or freight equipment, are produced to order with relatively long gestation periods. In contrast to these items in the E group, consumer durables, such as cars, radio and television sets, or households appliances, are mostly standardized goods sold from stock. Materials contain many staples but also some made-to-order products (e.g., steel sheets cut to customer specifications), which, however, have generally short delivery periods.

The leads of new orders at the postwar business cycle turns show no such systematic differentiation among the groups. Their averages lie in the range of five to seven months for each group. This result suggests, and the data confirm, that the turns of shipments have tended to occur first in consumer durables, next in materials, and last in equipment. The cyclical conformity of new orders is high throughout, as indicated by the small proportion of "unmatched" turns. The frequency of leads is also

high throughout; in fact, it is somewhat larger for materials than for equipment, and the figures for the consumer goods are not much lower.

The last section of the table is a summary of timing and amplitude measures for comprehensive series compiled by aggregating the component industries in each group. The average leads of new orders at business cycle turns are in general lower for these aggregates than for the corresponding sets of component series, suggesting that the industries with relatively short leads carry more weight, especially in groups C and M. For the comparisons with shipments there are no such systematic differences. The average cyclical amplitudes are throughout larger for new orders than for shipments, but the contrast is much more marked in the industries producing equipment than in those making consumer durables, and it is weakest for the manufacturers of materials.

Unfilled Orders, Price Changes, and Business Fluctuations was published in the November 1962 issue of *The Review of Economics and Statistics* and reprinted as Occasional Paper 84.

VICTOR ZARNOWITZ

CHANGES IN OWNERSHIP OF PURCHASED MATERIALS

A manuscript for an Occasional Paper is in preparation. It supplements the preliminary report on the work on ownership published in the Joint Economic Committee compendium on inventory fluctuations. There, changes in ownership (changes in stocks of and outstanding orders for purchased materials) were examined to learn what light they cast on the inventory cycle or, more generally, on the process whereby fluctuations in final demand are amplified in the course of producing and distributing finished goods.

Study of this problem is hindered by deficiency of appropriate data and excess of sufficient reason for augmented fluctuation. The former difficulty was illustrated by a painstaking examination of whether use of unpublished data on orders, stocks, and the like could materially improve the series utilized in the pre-

liminary report. The hope was disappointed, but, happily, work now in progress at the Bureau of the Census promises partial remedy in the future.

The second difficulty—overexplanation of observed fluctuation—is well exhibited in one remarkable pool of information. It consists of reports by members of the Chicago Association of Purchasing Agents which, uniquely, bear both on the selling and on the buying of the same company—the information that is essential to an understanding of how fluctuations in demand are passed backward to the previous member of the production chain. The companies report data that picture, in effect, changes in unfilled sales orders, in production and in stocks of purchased materials, in several components of unfilled purchase orders, and in the prices paid for principal materials. Changes in unfilled orders of the product the company buys appear to move in strong conformity with, and if anything a trifle earlier than, changes in unfilled orders for the product the company sells. Changes in production and in prices of materials likewise reproduce the same movements, the former very sharply. Changes in inventories of purchased materials follow suit after a delay which is longer than can be explained by the time required for unfilled purchase orders to be shipped to the purchasing firm. These data, viewed in conjunction with the other material that it has been possible to assemble, offer some provocative hints about how changes in demand *interact* with changes in supply to augment instability.

The final section of the monograph advances a hypothesis about why the potentially explosive influence on the inventory cycle of circular and immediate interaction between changes in demand and supply does not in fact seem to materialize in that form.

RUTH P. MACK

STATISTICAL INDICATORS

Studies during the past year have been directed along four lines:

1. Analysis of patterns of expansion. We have conducted a number of experiments based on the idea that an expansion—the rise from a cyclical trough to a peak in economic activity —can be divided into two parts. In the initial, or recovery, phase the volume of activity is merely getting back to the previous peak level. Naturally the magnitude of the rise during this phase is precisely equal to the magnitude of the preceding decline. The second phase is the growth phase of the expansion. Its magnitude measures the vigor of the expansion beyond the recovery point.

In the case of industrial production and some other measures of aggregate activity, it appears that the recovery phase tends to be short when the preceding contraction has been mild, but that the rate of advance during the recovery phase is apt to be slow. That is, the recovery point (preceding peak level) is reached sooner after a mild recession than after a severe one, although the rate of advance toward it is slower. Another observation is that the level of output relative to its preceding peak level, after a considerable period of expansion has elapsed, is correlated fairly well with its ultimate level at the end of the expansion. That is, the extent of "growth" measured as the expansion proceeds is roughly correlated with the ultimate "growth" achieved during the expansion.

The figures in Table IV. 8, based on the Federal Reserve index of industrial production, illustrate the latter point, with the expansions arrayed according to ultimate "growth" (column 6).

Expressed in these terms, during the current expansion (beginning in February 1961), industrial production after twelve months was 5.7 per cent above its level at the preceding business cycle peak (May 1960); after eighteen months, 9.1 per cent; and after twenty-two months (i.e., in December 1962), 9.0 per cent. The latter figure exceeds the corresponding rise in five of the seven earlier peacetime expansions. Indeed, the rise to date exceeds the ultimate rise in four of the earlier peacetime expansions.

As a device for appraising an expansion while it is in progress, this scheme has many limitations. It is sensitive to factors influencing the level of activity at the preceding business

TABLE IV.8

CHANGES IN INDUSTRIAL PRODUCTION DURING BUSINESS CYCLE EXPANSIONS, 1920-58

Preceding Business Cycle Peak (1)	Business Cycle Trough (2)	Per Cent Above (+) or Below (−) Standing[a] at Preceding Peak			
		After 12 Mos. of Expansion (3)	After 18 Mos. of Expansion (4)	After 22 Mos. of Expansion (5)	At End of Expansion (6)
		PEACETIME EXPANSIONS			
Feb. 1945	Oct. 1945	−22.0	−20.2	−19.9	−16.1 (37 mos.)
Aug. 1929	Mar. 1933	−29.8	−38.1	−26.1	+6.4 (50 mos.)
July 1957	Apr. 1958	+4.8	+0.6	+8.6	+7.5 (25 mos.)
May 1923	July 1924	−0.2	+2.6	+3.3	+7.7 (27 mos.)
July 1953	Aug. 1954	+5.0	+6.3	+6.4	+9.5 (35 mos.)
Jan. 1920	July 1921	−6.5	+6.9	+15.6	+15.6 (22 mos.)
Oct. 1926	Nov. 1927	+7.9	+15.0	+15.5[b]	+16.7 (21 mos.)
		WARTIME EXPANSIONS			
Nov. 1948	Oct. 1949	+16.8	+20.4	+16.8	+37.1 (45 mos.)
May 1937	June 1938	−13.5	+4.5	−4.5	+94.3 (80 mos.)

[a] Three-month average centered on the business cycle peak month.
[b] Includes the first month of the next contraction.

cycle peak, to the length and severity of the contraction following that peak, and to events such as wars or strikes that occur during the expansion itself. Studies of these matters are continuing.

2. The National Bureau's first publication on indicators, issued in 1938, provided a selection and classification of indicators based on their behavior at business cycle troughs. The two subsequent lists, issued in 1950 and 1960, were based on behavior at both peaks and troughs, and the classification did not distinguish between peak and trough behavior. That is, the selected leading indicators usually led at both turns, the roughly coincident indicators were roughly coincident at both, and the lagging indicators usually lagged at both. However, separate historical information for peaks and troughs was provided, and in some cases it indicated significant differences in timing.

Confining a list of indicators to those that behave similarly at both turns is a limitation, since some useful indicators may be excluded by this criterion. Moreover, if there are significant differences among series in their length of lead, or significant differences between peak and trough behavior, the user of indicators should take advantage of this information. With this in mind, we have begun work upon a new classification of indicators that allows both for differences in peak and trough timing and for differences in length of lead or lag. This work will take account of new series and analyses that have become available since 1960 and will probably include some indicators that were formerly excluded according to the criterion mentioned above.

One of the clearest and most important cases of difference in peak-trough timing is the unemployment rate, which has systematically

exhibited short leads at business cycle peaks and short lags at business cycle troughs. Arthur Burns has suggested the following interpretation of this behavior. Assume that the labor force is virtually immune to business cycle influences, and rises steadily as the population grows. Assume further that as a business cycle expansion proceeds, employment continues to increase, but that the rate of increase diminishes as the labor market tightens, wage rates advance more rapidly, and output in an increasing number of industries begins to diminish. As soon as the rate of increase in employment becomes less than that in the labor force, unemployment will start to rise, and this may happen before employment actually declines. Hence the upturn in the number of unemployed will lead the peak in employment. The lead in the unemployment rate may be somewhat shorter than this, however, since the number of unemployed is divided by a steadily rising labor force. A similar argument explains why the peak in unemployment comes after the trough in employment, if employment first increases at a slow pace (partly because some industries are still contracting, partly because labor input can be increased advantageously by lengthening the workweek) and then accelerates. Here, conversion of unemployment to a rate, by dividing by the labor force, is apt to reduce the lag.

A second example is personal income, which tends to lag at the peak and lead at the trough, just the opposite of unemployment. Indeed, the contracyclical movements of unemployment compensation payments probably contribute to this behavior. When these payments begin to rise in the late stages of expansion and continue through the contraction and into the early stages of the next upswing, the effect is to prolong the rise in personal income at the peak and to hasten its upturn at the trough. Other factors, such as the insensitivity of dividend and interest payments to mild business contractions, also contribute to this result.

A third significant example of different behavior at peaks from at troughs is provided by Victor Zarnowitz' work on orders. Typically order backlogs exhibit long leads at business cycle peaks and coincidence or a short lag at troughs. Zarnowitz' explanation is: "Production can continue to increase for some time after unfilled orders stop expanding, precisely because it can feed on the abundant reserves of work inherited from the period of backlog accumulation. [On the other hand], even a mere stabilization of unfilled orders following a period of decline may put an end to the contraction in output; an upturn in unfilled orders signalizing an influx of new business above the current rates of manufacturing operations will be likely to have an immediate stimulating effect."[1]

3. A thorough description of the National Bureau's method of determining the date of a business cycle peak or trough has not been published since 1946 (Burns and Mitchell, *Measuring Business Cycles,* Chapter IV). Although the principles followed have remained substantially the same, emphases have changed over the years and of course we utilize many of the new economic indicators that have become available. Since the chronology has come to be more widely used, it seems desirable to prepare a new description, with particular attention to the postwar dates, and Alexander Pitts has begun work toward this end. In the course of this work, such revisions of the postwar dates as appear called for will be made.

4. Studies of several indicators not presently included in our list have been undertaken, including: man-hours of nonfarm employment, monthly, Bureau of Labor Statistics; job openings pending, monthly, Bureau of Employment Security; display ads for executive job vacancies, monthly, Beveridge Organization, Inc.; unit labor costs, including fringe benefits, manufacturing, quarterly, Office of Business Economics and Federal Reserve Board; industry forecasts of machinery orders, quarterly, McGraw-Hill Company; new capital appropriations net of cancellations, manufacturing, quarterly, National Industrial Conference Board; common stock issues, manufacturing, monthly, Securities and Exchange Commis-

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[1]*Business Cycle Indicators,* Geoffrey H. Moore (ed.), Princeton for NBER, 1961, p. 451.

sion; net change in commercial and industrial loans outstanding, reporting members banks, monthly, Federal Reserve Board; automobile credit delinquency rates, monthly, American Bankers Association.

<div align="right">GEOFFREY H. MOORE</div>

APPLICATION OF ELECTRONIC COMPUTERS

Our work in computer applications is receiving continued support from the National Science Foundation and the International Business Machines Corporation.

BASIC PROGRAMS

The list of available basic programs has been increased during the last year; it reads now as follows:

Detailed descriptions of these programs were prepared in the form of memoranda. Programs which were recently completed or enlarged are described below.

ADDITIVE SEASONAL ANALYSIS

The program was written by Juanita Johnson and Richard Kilgore. It should be used when the series to be analyzed consists of components which are presumed to be additive (trend cycle + seasonal + irregular) or, possibly, when the original series includes negative values. The general approach is based on Method II of the Census Bureau except that additive relations are used instead of multiplicative ones. The present program does not carry through the entire time series decomposition, but stops with the completion of the seasonal adjustment and a five-month moving average of the adjusted series. Selected charts are provided on an optional basis.

	Title	Program Language	Machine Used	Latest Version
1.	Seasonal Analysis	FORTRAN and FAP	709/90	Jan. 1962
2.	Cyclical Analysis	SAP	704; 709/90	Jan. 1962
3.	Recession and Recovery Analysis	SAP	704	Oct. 1960
4.	Charting	FORTRAN and FAP	709/90	Jan. 1962
5.	Correlation and Regression	Only binary deck available	704	Jan. 1962
6.	Regression Analysis Supplement	FORTRAN	709/90	Nov. 1962
7.	Distribution Analysis, Ungrouped	SAP	704	Jan. 1962
8.	Frequency Distribution Analysis	SAP	704; 709/90	Jan. 1962
9.	Additive Seasonal Analysis	FORTRAN and FAP	709/90	May 1962
10.	Quarterly Seasonal Analysis	FORTRAN and FAP	709/90	Oct. 1962

Seasonal Analysis of Quarterly Data

In the past, we analyzed quarterly time series by the monthly seasonal adjustment program. This was somewhat cumbersome. We have now programmed a seasonal analysis designed for quarterly data. The analysis may be carried through on a multiplicative or an additive basis, at the option of the user.

The general approach is based on Method II of the Census Bureau, except that four-quarter moving averages replace twelve-month moving averages, and weighted five-quarter moving averages replace weighted fifteen-month moving averages. The program does not carry through a time series decomposition, but stops with the computation of the seasonal adjustment. For series analyzed multiplicatively, a weighted five-quarter moving average of the adjusted series is computed. Selected charts are available.

Regression Analysis Supplement

This program, written by Richard Kilgore, provides calculated values, residuals, and Durbin-Watson test statistics, as well as the covariance matrix and standard errors after adjustment for autocorrelation in the residuals. The program is intended as a supplement to the correlation and regression program (listed above, No. 5). The supplemental program must be provided with the regression coefficients (slopes and intercept), which can be computed by the general correlation program.

The calculated values of the dependent variable and the residuals can be useful in regression analysis in various ways. The residuals may be examined for systematic patterns; their behavior may suggest other explanatory variables. Extreme deviations from the regression line can be identified for possible further explanation or adjustment. The residuals can also be useful for various estimating or forecasting procedures. In addition to the usual printed form, the residuals can be obtained on punched cards for further processing.

Since the possibility of correlation among the error terms presents a serious problem in regression analysis, particularly when time series are used, a test is provided for serial correlation among the residuals. The program can compute the first-order autocorrelation coefficient of the residuals and the Durbin-Watson test statistic. Significance limits for this statistic are available and provide the user with a test for the existence of serial correlation.

The program also provides the standard errors and the full covariance matrix of the estimators of the regression coefficients both unadjusted and adjusted for autocorrelation in the residuals. The adjusted measures should be used if there is significant autocorrelation in the residuals.

Plans for Future Work

We have given some thought to plans for the next few years. These include rounding out existing program packages and developing new ones, preparing a manual on statistical and computational procedures for users of our programs and related ones, and continuing to help and advise the staff on the use of electronic computers in economic analysis. We have also considered undertaking, if resources permit, an investigation of some macroeconomic models with respect to the stability of parameters.

Regarding program development, we plan to expand the group of existing programs for income distribution analysis into a comprehensive package, including computation of logarithmic measures, shifts of class limits, estimation of class averages for bounded and for open-end classes. We intend to supplement our seasonal programs by incorporating current advances developed here and elsewhere. This includes (1) the latest improvements of the Census approach (X-9, X-10, and possibly Census III); (2) computation of weekly seasonal adjustments (testing and adaptation of Census and Federal Reserve Board methods); (3) seasonal adjustment by regression method (regression of deviations from trend-cycle on the trend-cycle); (4) provision for adjustment

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of seasonal indexes for influence of other variables, such as weather (by regressing so-called irregular component on the other variables); (5) significance tests for seasonality and confidence limits for seasonal factors and deseasonalized data; and (6) adaptation of existing spectral analysis programs, if such analysis proves useful for testing the quality of seasonal adjustments. There are other plans in connection with cyclical analysis, involving "optimum" aggregation procedures for business cycle indicators and similar groups of series, systematic comparison between the cyclical fluctuations of two or more time series, and so forth.

In view of the growing use of our collection of programs, we believe that it would be desirable to prepare for publication a manual containing descriptions and interpretations of the procedures used and measures computed by the basic NBER programs; program descriptions and users' guides; guidance on statistical methods to be used in data preparation and in checking, updating, testing, and comparing the results of the described methods; and guidance on the economics of computerized analysis.

GERHARD BRY
CHARLOTTE BOSCHAN

SOURCE BOOK OF MONTHLY AND QUARTERLY SERIES RELATING TO INVESTMENT

This project, supported by a grant from the National Science Foundation, will make available to the public the National Bureau's collection of historical series relating to physical investment, together with other important data in this area.

Doris Preston and I, with some help during the summer from Carol Schwartz, have prepared a revised list of the series to be included. There are close to 300 series in the list, of which over sixty cover national or sectoral investment in both plant and equipment; more than eighty, construction; about sixty, investment in producer durables; and roughly twenty, investment in consumer durables. The list also includes thirty series on capacity or equipment in place and about forty on the output or consumption of materials used in construction or in production of durable goods. Some annual series have been included for periods or types of investment not covered by the quarterly or monthly data.

The work of collecting a few important series not in the NBER files and bringing up to date others which had been collected in the past is well advanced. It is expected that the final publication will include original and seasonally adjusted data and some measures of the cyclical behavior of the series.

ROBERT E. LIPSEY

OTHER STUDIES

Plans for a new study of short-term economic forecasting are described in Part III.

Millard Hastay is planning to complete the revision of his manuscript on businessmen's expectations during 1963. A conference proceedings volume, "Models of Income Determination," is being prepared for press.

Part II contains reports on applications of business cycle research and on the studies of credit quality. For reports on other business cycles studies, see those by Kessel, Cagan, Earley, and Atkinson in Section 4, and by Mintz in Section 5. Studies of long swings in construction, population, and labor force are reported in Section 1.

4. FINANCIAL INSTITUTIONS AND PROCESSES

CONSUMER CREDIT

The objective of the consumer credit study, financed with a general grant from several finance companies, is to assess the role of consumer credit in the functioning of the economy of the United States. Attention is centered on analysis of consumer behavior, the level and structure of finance rates and costs, and the functioning of the credit markets as affected by economic and legislative forces.

During the past year, Paul F. Smith's preliminary report, *Cost of Providing Consumer Credit* (Occasional Paper 83), was published, and further progress was made on other studies. Five manuscripts are being reviewed by the Board or will be ready for review shortly:

1. "Consumer Credit Costs at Four Major Types of Financial Institutions, 1949-59," by Paul F. Smith (monograph)

2. "Consumer Credit Finance Charges: Rate Information and Quotation," by Wallace P. Mors (monograph)

3. "Trends and Cycles in the Commercial Paper Market," by Richard T. Selden (Occasional Paper)

4. "New-Automobile Finance Rates, 1924-62," by Robert P. Shay (Occasional Paper)

5. "Consumer Sensitivity to Finance Rates," by F. Thomas Juster and Robert P. Shay

Six additional manuscripts are in preparation:

6. "The Rate Structure in Automobile Financing," by Robert P. Shay

7. "Consumer Credit and the Flow of Funds," by Richard T. Selden

8. "Consumer Credit Use and Saving," by F. Thomas Juster

9. "Financial Adjustments to Unemployment," by Philip A. Klein

10. "Economic Effects of State Legal Rate Ceilings upon Finance Rates," by Wallace P. Mors

11. "Consumer Credit: A Summary Analysis," by Robert P. Shay

THE RATE STRUCTURE IN AUTOMOBILE FINANCING

A proposed Occasional Paper, "New-Automobile Finance Rates, 1924-62," was revised during the year to incorporate changes suggested by members of the staff and the advisory committee to the consumer credit study. It is expected to be submitted to the Board of Directors shortly.

For the monograph that is in preparation, "The Rate Structure in Automobile Financing," a number of multiple regressions were run on the IBM 7090 computer. The dependent variable in these regressions was the finance rate charged consumers on individual contracts in 1954-55 by sales finance companies and banks. Some thirty independent variables were tested, representing contract terms, borrower risk, and market characteristics. Preliminary findings suggest that relationships differ according to whether the credit source is a sales finance company, a bank lending indirectly through a dealer, or a direct lending bank. Among the variables that were significant for some credit sources were the contract maturity, loan size, down payment, the dealer's margin, credit life insurance charges, the borrower's occupation, and state legal rate ceilings.

Using new-auto contracts in 1958-59 from a sample of four large sales finance companies, a similar computer program will test the association between (1) the auto dealer and finance company percentage point shares of the finance rate charged consumers and (2) some twenty-five market and contract risk variables.

A final computer program remains to be worked out for used-car contracts in 1958 and 1959. The results of these investigations will be incorporated in a manuscript which should be in draft form by mid-1963.

ROBERT P. SHAY

CONSUMER CREDIT RATE QUOTATION AND STATE LEGISLATION

A revised manuscript of "Consumer Credit Finance Charges: Rate Information and Quota-

tion" has been completed. Some major observations are as follows: (1) scattered evidence indicates that relatively few consumers calculate effective annual finance rates with reasonable accuracy, and most consumers appear to believe that these rates are substantially lower than they are; (2) nevertheless, evidence suggests that consumers know that small loans cost more than large loans and that auto credit is cheaper than most other forms of instalment credit; (3) different methods of computing finance charges require a conversion formula to put them on a comparable rate basis, and a number of technical problems are involved in doing so; (4) possible comparable bases are effective annual rates, effective monthly rates, and a uniform "dollars per hundred borrowed" rate equivalent; (5) available evidence suggests the existence of price competition in the new-car and personal loan markets under current systems of rate information and quotations; (6) uniform rate quotation (in any of the above forms) is likely to increase the elasticity of demand for the credit of individual credit sources and to stimulate price (rate) competition.

Work is in progress on a separate study of the effect of legal ceilings on finance rates for new cars, used cars, and consumer finance company loans. A report should be in a draft form by the end of the summer.

WALLACE P. MORS

CONSUMER FINANCES

The joint manuscript with Robert P. Shay, "An Analysis of Consumer Finance Rate Knowledge, Rate Sensitivity, and Investment in Durable Assets," has been reviewed by the advisory committee and the staff, and is now in process of revision for submission to the Board of Directors. It is anticipated that the revised manuscript will be circulated to the Board by mid-1963.

During the year the Survey Research Center at the University of Michigan completed editing and recoding a series of reinterview surveys. The data comprise a random sample of the population, and cover the period 1954 to 1957. The recorded data contain quantitative esti-

mates of the change in assets and debts for each household over a three-year period, as well as reasonably detailed information about purchases of durable goods. The processing of these data began in the latter half of 1962. I plan to use this body of evidence to test, on a random population sample, some of the relations between credit use and saving found in the NBER sample of Consumers Union subscribers.

F. THOMAS JUSTER

FINANCIAL ADJUSTMENTS TO UNEMPLOYMENT

During the past year the basic data for this study have been subjected to rather extensive revision, and the analysis is now essentially complete. It is based on 1,836 questionnaire interviews with individuals applying for unemployment compensation. The sample is composed of six subsamples of interviews conducted in six states during the period 1954-58. We have utilized the information to determine the character of the financial adjustment to unemployment—whether through drawing down liquid assets, increasing indebtedness, or reducing expenditure—and the pattern of relative importance attached to the major kinds of adjustment within each of these broad categories. We have also tried to determine how this pattern is affected by the duration of unemployment.

One of the results of the analysis is an estimate of the destabilizing consequences of unemployment to the American economy. Because information on total expenditure change was not complete in the basic survey data, it has been estimated from the changes in income, liquid assets, and certain kinds of debt which clearly represent adjustments to unemployment. For the entire sample, income declined by $1,409,000; liquid assets were reduced by $282,000; and unemployment-sensitive debt increased by $157,000.[1] If it is assumed that

[1] We have attempted to separate debt incurred for such purposes as the acquisition of consumer durables from debt adjustments in response to unemployment (i.e., borrowing money, failing to pay bills, etc.). It is the latter which we call "unemployment-sensitive" debt.

TABLE IV.9

CHANGE IN INCOME, EXPENDITURES, DEBT, AND LIQUID ASSETS FOR
1,836 UNEMPLOYED PERSONS WITH AND WITHOUT LIQUID ASSETS, BY
DURATION OF UNEMPLOYMENT

Duration of Unemployment (weeks) (1)	Number in Sample (2)	Average Reduction in Income[a] (dollars) (3)	Average Reduction in Consumption Expenditures[b] (dollars) (4)	*Average Offset to Income Reduction Through*		Estimated Marginal Propensity to Consume[e] (7)
				Debt Adjustment[c] (dollars) (5)	Liquid Assets Adjustment[d] (dollars) (6)	
WITHOUT LIQUID ASSETS AT BEGINNING OF YEAR[f]						
0-9	124	296	235	66	− 6	.79
10-14	178	442	350	96	− 4	.79
15-19	177	609	548	61	0	.90
20-26	146	819	734	114	−29	.90
Over 26	214	1,184	1,126	70	−13	.95
Total	839	711	640	81	−10	.90
WITH LIQUID ASSETS AT BEGINNING OF YEAR[f]						
0-9	168	345	10	85	250	.03
10-14	219	511	186	106	218	.36
15-19	210	772	276	91	404	.36
20-26	175	945	576	88	281	.61
Over 26	225	1,404	1,031	76	297	.73
Total	997	816	435	90	291	.53
BOTH GROUPS						
0-9	292	324	106	77	142	.33
10-14	397	480	260	102	118	.54
15-19	387	697	401	78	219	.57
20-26	321	888	648	100	140	.73
Over 26	439	1,297	1,077	73	146	.83
Total	1,836	768	528	86	154	.69

[a] Adjusted for unemployment compensation payments received during unemployment.

[b] Estimated as a residual (col. 3 minus col. 5 minus col. 6); see text. The figures in the table may not add precisely to totals due to rounding.

[c] Net increase during the survey year in money borrowed and in unpaid bills, plus nonpayment of instalment obligations due to delinquency or repossession.

[d] A decrease in liquid assets is a positive offset, an increase is a negative offset.

[e] Col. 4 divided by col. 3.

[f] For most sample households, information on liquid asset *holdings* was not obtained, but only on the change in such assets. For these households, it is assumed that a report of no change means the absence of asset holdings at the beginning of the survey year. For about one-fifth of the sample, liquid asset holdings at both beginning and end of the survey year were obtained; the small increases (negative sign) in liquid assets shown in col. 6 result from the fact that a few of these households reported no assets at the beginning of the year but some at the end.

these changes in liquid assets and debt represent deviations from the change in liquid assets and debt during normal (employed) periods, hence are an offset to the reduction in income produced by unemployment, and that no other unemployment-induced changes took place in the net worth position of sample households, it follows that consumption expenditures must have fallen by $970,000.

This reduction in expenditures during the survey year is presumably a consequence, in large part, of the reduction in income that accompanies unemployment. Table IV. 9 shows the relation between the change in expenditure and the change in income for groups with and without liquid assets, classified by duration of unemployment. As the period of unemployment lengthens, the change in expenditure becomes a large fraction of the change in income, so that when an individual has been unemployed as long as twenty-six weeks (by which time, in most of the states included in the survey, unemployment compensation payments were exhausted) almost the entire adjustment to income reduction, for those individuals not possessing liquid assets, takes the form of expenditure reductions.

Table IV. 9 also shows that the expenditure reduction for the group without liquid assets is invariably a much larger part of the total income change in each unemployment duration class. Indeed, the percentage of the income change which is met by expenditure reduction is larger for those who have been unemployed less than nine weeks but have no liquid assets than it is for those who have been unemployed more than twenty-six weeks but possess liquid assets to fall back on.

The implications of these results for assessing the destabilizing consequences of unemployment, particularly long-duration unemployment, may be briefly mentioned. Reducing liquid assets and increasing indebtedness (which is more feasible for those with liquid asset holdings) clearly have smaller destabilizing impacts on the economy than does the reduction of consumption expenditures. The latter initiates a chain of consequences which may lead to cumulative contraction via the well-known multiplier effect. Estimates in Table IV. 9 of the marginal propensity to consume indicate that the destabilizing influence of unemployment is increasingly serious the longer unemployment lasts, and that liquid asset holdings exert a powerful—though temporary—stabilizing influence. Increase in debt, though quantitatively less important, also acts as a stabilizing (though equally temporary) influence on consumption. Although the data are not shown in Table IV. 9, income supplements such as unemployment compensation are quantitatively the most important stabilizing element, and have the added advantage of not being associated with a deterioration in the net worth position of the household.

These estimates, though crude because of deficiencies in the basic data, are nonetheless suggestive of the factors that have helped to prevent serious recessions in the post-World War II period. Had the level of liquid assets held by the public not been extraordinarily high, had the opportunities to utilize consumer credit not been so widespread, and had income supplements not been as large, some of the mild recessions experienced since 1946 might well have developed into more serious recessions or depressions.

The study is now basically completed and the final results are being written up, with a draft manuscript to be completed shortly.

PHILIP A. KLEIN

INTEREST RATES

The objective of this study, undertaken with the aid of grants from the Life Insurance Association of America, is to augment what we know about the behavior and determinants of interest rates. We are investigating both the factors influencing the movements of yields on specific types of assets and the factors determining the spread between them. The primary emphasis is upon the postwar behavior of interest rates in the United States, but, when longer coverage can contribute toward an understanding of forces influencing interest rates, exploration is being extended as far back as data permit.

The following manuscripts are nearing completion: "The Cyclical Behavior of the Term Structure of Interest Rates," by Reuben Kessel; "Yield Differentials Between Newly Issued and Seasoned Securities," by Joseph Conard; and "Seasonal Variations in Interest Rates," by William H. Brown.

Phillip Cagan and Morris Beck joined our staff this year. Cagan has begun work on an analysis of interest rates and business cycles, and Beck is collaborating with Jack Guttentag on a study of mortgage rates.

The study is benefiting from the advice and assistance of an advisory committee composed of W. Braddock Hickman (chairman), Federal Reserve Bank of Cleveland; Julian D. Anthony, Hartford Life Insurance Company; Daniel H. Brill, Board of Governors of the Federal Reserve System; Lester V. Chandler, Princeton University; W. A. Clarke, W. A. Clarke Mortgage Company; George T. Conklin Jr., Guardian Life Insurance Company of America; Milton Friedman, University of Chicago; Raymond W. Goldsmith, National Bureau of Economic Research; Sidney Homer, Salomon Brothers & Hutzler; Norris Johnson, First National City Bank of New York; Robert G. Link, Federal Reserve Bank of New York; Roger F. Murray, National Bureau of Economic Research; James J. O'Leary, Life Insurance Association of America; Roy L. Reierson, Bankers Trust Company; Eli Shapiro, Harvard University; Henry C. Wallich, Yale University; C. Richard Youngdahl, Aubrey G. Lanston & Co., Inc.

The aims and some of the preliminary findings of the several projects are described in the following reports.

JOSEPH W. CONARD
WILLIAM H. BROWN, JR.

SEASONAL VARIATIONS IN INTEREST RATES

Seasonal variations in interest rates are being investigated for two reasons. One is that if seasonal variations are present, it is ordinarily desirable to measure and eliminate them from the data before proceeding with further analysis. The other is that the seasonal patterns themselves are of interest, and study of them may illuminate some of the factors influencing interest rates generally. In the period 1948-61, a definite seasonal pattern appears in Treasury bill rates and other short-term rates, and in some of the long-term yields. Since the movements of all the long-term yields were quite similar, it was decided to estimate the seasonal in all, although the adjustment is small and often of uncertain value. The following seasonally adjusted data have been derived:

Issue	Period	Weekly (W) or Monthly (M)
Thirty-day Treasury bills	1952-61	W
Fifty-five-day Treasury bills	1954-61	W
Ninety-one-day Treasury bills	1948-61	W and M
Commercial paper	1953-61	M
Bankers acceptances	1955-61	M
Nine-to twelve-month U.S. governments	1948-61	M
Three-to five-year U.S. governments	1948-61	M
Long-term U.S. governments	1948-61	W and M
Moody's Aaa corporates	1948-61	W and M
Moody's Baa corporates	1948-61	W and M
Moody's Aaa railroads	1948-61	W and M
Moody's Baa railroads	1948-61	W and M
Moody's Aaa industrials	1948-61	W and M
Moody's Baa Industrials	1948-61	W and M
Moody's Aaa utilities	1948-61	W and M
Moody's Baa utilities	1948-61	W and M
Moody's Aaa state and local	1948-61	W and M
Moody's Baa state and local	1948-61	W and M
Standard and Poor's high-grade municipal	1948-61	M

While most of the series were adjusted on both a monthly and weekly basis, it became apparent that the weekly adjustment gives a much better picture of the actual seasonal movement. For example, during August there is a definite rise in the weekly seasonal factors for Treasury bills (see Chart 2), whereas the monthly adjustment indicates no significant seasonal in that month.

CHART 2

Three-Month Treasury Bill Rates, by Weeks (Monday), 1960
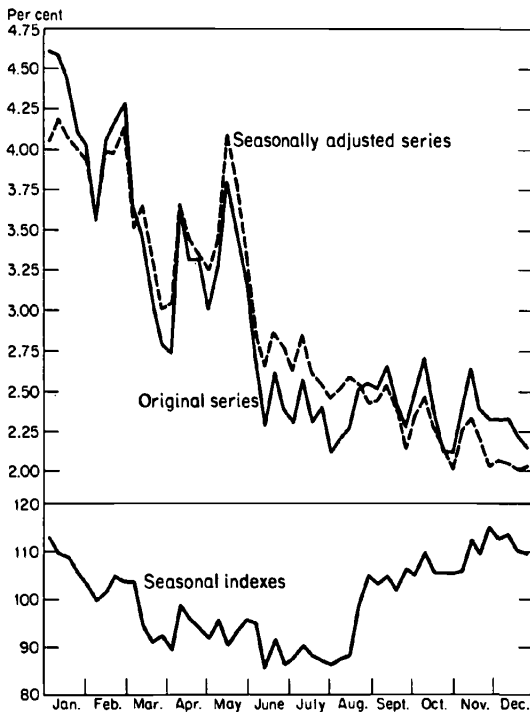
Experiments were carried out with the additive as well as multiplicative adjustment processes. The adjustments are approximately the same in all but two months, June and July. In these months the additive adjustment gives a much larger adjustment factor when rates are cyclically low, and the multiplicative process gives a somewhat larger adjustment when rates are cyclically high. Because the size of the additive adjustment seems to be too large when rates are cyclically low, amounting almost to a third of the total yield of Treasury bills, it was decided that the multiplicative adjustment was preferable.

The method used in all cases was the Bureau of the Census Method II. When weekly adjustments were made, the procedure used was that described by Julius Shiskin in *Business Cycle Indicators* (pp. 602-604).

Further work is continuing on exploring the basic causes of the seasonal. As was described in last year's Annual Report, the primary cause of the seasonal in the short-term market is the seasonal imbalance in Treasury receipts. It is as yet unclear whether the smaller seasonal in the long-term markets can be explained in similar fashion. To investigate this and for other purposes in the project, ownership data have been collected on a monthly basis for all government securities. These data have been classified both by individual security and owner and by term for the major financial institutions.

There are a number of reasons to believe that the seasonal on short-term securities was reduced in 1961 but not completely eliminated. It was largely eliminated in 1962. Two reasons confirm our previous thinking on the cause of the seasonal: (1) There was a substantial reduction in the variation of the supply of bills made available to the public by the federal government in 1962 and some reduction in 1961. (2) In 1962 the variation during the year in net cash borrowing from the public was considerably smaller than it had been recently.

As a further help in explaining postwar seasonal fluctuations in yields, the following series of data other than interest rates have been seasonally adjusted on a monthly basis:

I. *Government Securities Series*

   1. Total supply of bills outstanding

   2. Total supply of bills in the hands of the public

   3. Total supply of government securities maturing within one year

   4. Total supply of government securities maturing within one year in the hands of the public

   5. Total supply of government securities maturing within one year held by the nonbank public

WILLIAM H. BROWN, JR.

YIELD SPREADS BETWEEN NEW AND OUTSTANDING ISSUES

The behavior of yields on new issues and of the spread between these and the yields on outstandings is of special interest for a number of reasons. Borrowing institutions are, of course, interested in knowing about the behavior of new-issue yields because they closely approximate the cost of funds. Lenders are interested in both new-issue yields and the relation of these to yields on outstandings because a wise investment policy can take advantage of spreads and changes in spreads if reasonable forecasts can be made. Economists are interested for both these reasons and others as well. One such reason is this: In economic analysis a common first approximation is that transactors in markets will act so as to maximize their expected gains. If new-issue yields differ significantly from the yields of securities which are otherwise homogeneous with them, some explanation must be found.

Still another reason that this question is of importance to economists, and to the financial community as well, is the widely held presumption that new-issue yields are more sensitive to market forces, and hence may provide better indicators than outstanding yields of the direction and timing of market forces. Finally, economists are interested in knowing the effectiveness of monetary policies. If it is true that new-issue yields do not behave in the same way as yields on seasoned issues, then it is the former more than the latter which should be studied in evaluating the possible influence of monetary policy, since a major effect on the level of economic activity often attributed to monetary policy flows largely through its influence on the behavior of borrowers.

In last year's Annual Report we stated that the recorded spreads between yields on new issues and yields on seasoned securities appear at many times to be quite substantial, often permitting the investor to receive higher returns on newly issued Aa corporates than on outstandings of A or even Baa quality. We also stated that preliminary investigations suggest that a large part of this spread may be spurious in the sense that it would not appear if the seasoned issues studied were of the same coupon as the new issues. Finally, we described some of the apparent causes of the remaining new-outstanding yield spreads.

During the past year we have refined our regressions on the Moody series, compared them with a number of other series, broken them down into economically meaningful time intervals, and adjusted the tests for statistical significance to allow for autocorrelation among residuals and for serial correlation among the independent variables. A draft report on the study has been prepared.

The period studied begins with the Treasury-Federal Reserve Accord of March 1951 and goes through 1960. The series studied include Moody Aa corporates, Sidney Homer's series of approximately Aa utilities, the Bankers Trust series of "Grade two" utilities (most of which are approximately Aa rated by Moody), Mortimer Kaplan's series of "recently issued" Aa securities quoted on the market, and Moody Baa corporates. We have experimented also with subseries of both the Homer and Moody series. In these the seasoned issues whose yields

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are used are those with coupon similar to the coupon of the new issue with which a comparison is being made.

In general, the study of all series and sub-series tends to suggest similar conclusions. When series are not adjusted for differences in coupon between new and outstandings, one of the most important variables appears to be the level of interest rates or one of its proxies: either the bill rate or the average discount at which outstandings are selling.

These variables evidently reflect in large measure the spurious appearance of yield spread arising from differences in coupons between new and seasoned issues. When series are adjusted for this coupon difference, the level of interest rates does not seem to be an important and consistently significant factor accounting for the spread.

A second highly significant determinant of recorded new-outstanding yield spreads is the rate of change in market interest rates. This seems reasonable, because dealers might be expected to wish to clear their shelves rapidly if rates are rising, and a sweetening of yields on new offerings would achieve that purpose. Current yield spreads appear to be measurably influenced by changes in interest rates over a fairly long period. Indeed, the difference between current rates and the average rate during the period of seven to twelve months preceding the current period is often fairly important. But the most significant time period is that of the immediately preceding month.

The volume of new issues over the immediate past might readily be expected to have substantial influence on the spread that dealers would wish to provide in order to clear shelves. The best time period for this measure of volume proved to be the period of the current and preceding month (or, in the Homer series, the volume over the two preceding months). The securities most appropriate to include in the volume series proved to be all new corporate issues, including direct placements and equities.

Other variables which might be thought to influence yield spreads showed little or no effect. The volume of new issues hanging over the market showed positive correlation with yield spread, as would be expected, but not at statistically significant levels. One might expect that the proportion of new issues which remained longer in syndicate over the immediate past would have a positive effect on yield spreads, but what correlation appeared here was either insignificant or negative.

The most appropriate multiple regressions proved generally to include (1) either correction for difference in coupon between new and seasoned issues or, where data do not permit that adjustment, a variable such as the average discount of outstandings or the bill rate; (2) four variables for past changes in average interest rates, each covering a different past period; (3) the volume of new issues over the recent past.

In the monthly series, where correction for coupon was possible (the Moody and the Homer series), our analysis provided an explanation of most of the variance in yield spread, the proportion explained coming to 80 per cent for the Moody series and 92 per cent in the Homer series. If quarterly series are used, erratic variation in the recorded figures for new issues is greatly reduced, and the resulting explanation of variance in yield spread comes to 90 per cent for the Moody series and 96 per cent for the Homer series. This apparent improvement in results is achieved despite the fact that the quarterly variables for changes in yields and for volume data are less appropriate than those in the monthly series. It should be recognized, however, that this finding indicates our inability statistically to explain the erratic variations in the dependent variable. The explanatory power of our model was less satisfactory for other series than for those of Moody and Homer, but we generally achieved about a 60 per cent explanation or better. Since the Homer series was most completely tailored for this study by attempting most fully to avoid heterogeneity between the new and outstanding securities, it is not surprising that it provided the best correlations. It is probably correct to say that since this series provides the best basis for isolating the effects of the variables we sought to study, it gives the most accurate picture of the explanatory power of these

CHART 3

**New-Outstanding Yield Spreads and Residuals for
Homer Aa Public Utilities and Moody Aa Corporates**

Basis points

Homer Aa Public Utilities
- – – – – Spread against yield on 2¾ - 2⅞ per cent outstandings
- ——— Spread against yield on outstandings of similar coupons
- ·············· Residuals from multiple regression using spread against outstandings of similar coupons

Moody Aa Corporates
- – – – – Spread against average yield on outstandings
- ——— Spread against yield on outstandings of similar coupons
- ·············· Residuals from multiple regression using spread against outstandings of similar coupons

variables.

From Chart 3 it is possible to see how much of the initial recorded spreads is eliminated when correction is made for difference in coupon between new and seasoned issues. This gives more nearly the true new-outstanding yield spread. In the Moody series this correction suggests that about 42 per cent of the apparent spread is spurious. In the Homer data, the yield spread against outstandings of current coupon is only about 35 per cent of the spread against deep discount outstandings.

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JOSEPH W. CONARD
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CYCLICAL BEHAVIOR OF TERM STRUCTURE OF INTEREST RATES

A preliminary paper based upon my study was presented at the Econometric Society meetings in Pittsburgh in December. This paper put forth the thesis that the term structure of interest rates can be viewed as a function of two independent variables: expectations of future short rates and liquidity preference. Jointly these variables can explain such phenomena as a persistent yield differential between short and long governments over the full cycle, high short rates relative to long rates about cyclical peaks, and low short rates relative to long rates about cyclical troughs.

It is argued that the market is unable to equalize the pecuniary yields of long and short securities of equivalent default risk because of the existence of transaction costs for those who are willing to provide the relevant speculative

services. Hence despite the operations of many financial institutions that are short on short securities and long on long securities, a persistent yield differential between long and short terms of equal default risk remains.

This interpretation of the determinants of the term structure of interest rates is consistent with certain theoretical views in the field of money and with other related empirical observations. On a theoretical level, we are accustomed to thinking that there is an opportunity cost of holding cash balances that can be measured by the income that could have derived from holding bonds, stocks, or other pecuniary income-earning assets. The view of the term structure of interest rates presented extends this generalization about money to the domain of money substitutes.

On an empirical level, this thesis about term structure of interest rates implies that the mean and the variance in holding-period yields of securities of equivalent default risk should rise with term to maturity. The preference of the market for short relative to long terms is rooted in the assumption that the market is willing to trade a lower mean return for a lower variance. The presence, on relatively infrequent occasions, of negative forward rates in the bill market suggests that the costs of arbitrage must be positive; otherwise, negative forward rates could not exist. Hence by an a fortiori argument, the costs of speculation on the yield differential between longs and shorts must also be positive.

I am currently in the process of preparing what I hope will be a final draft of a proposed Occasional Paper, "The Cyclical Behavior of the Term Structure of Interest Rates," for the advisory committee and the Board of Directors.

REUBEN A. KESSEL

INTEREST RATES AND BUSINESS CYCLES

The objectives of the study are to establish the general cyclical characteristics of interest rates particularly in relation to business cycles, to test prevailing notions about this behavior, and to explore the sources of the movements. I plan to analyze a broad group of series from the earliest available date through 1961 via the National Bureau's electronic computer program. Series have been selected to represent short-and long-term rates as well as corporate, federal, and state or municipal securities. We have decided to use numerical rather than relative deviations from cycle bases, since interest rates have no consistent trends over the entire periods studied and the numerical deviations can readily be used to compute interest rate differentials. The seasonal adjustments for the post-World War II segments will utilize William Brown's work. Seasonal adjustments already performed on the earlier data appear satisfactory and will be used. So far the series have been collected, specific cycles dated, and analyses from the computer program are in hand. This spring we expect to prepare a working paper describing the results.

PHILLIP CAGAN

DIRECT PLACEMENTS

The prime purposes of this study are to measure and explain such changes as have occurred since 1950 in yields on direct placements. Direct placements are long-term debt issues sold directly by corporate borrowers to financial institutions—primarily life insurance companies.

The first step was the collection of the following data on each of about 3,500 individual placements: yield, authorization date, amount borrowed, coupon, purchase price, maturity, amortization schedule, type of security, call provisions, size of borrower, industrial classification of borrower, the borrower's sales and earnings over the five-year period immediately preceding the loan, working capital position of the borrower, capital structure of the borrower, interest charges, and certain other miscellaneous information.

The next step was the construction of a hypothesis to explain variations in yield at any given moment of time. After discussion with the lending officers of various life insurance companies and a certain amount of preliminary

experimentation, I concluded that much of the variation in yield at any given moment of time could be explained by some combination of the following variables: maturity, earnings before interest and taxes, sales, size of issue, total capitalization, times charges earned, standard deviation of times charges, trend in times charges earned, ratio of working capital to pro-forma long-term debt, ratio of pro-forma long-term debt to total capitalization, years nonrefundable, industrial class, type of security. It seemed best to take all the numerical variables, including yield, in logarithmic form.

The next step was to test this hypothesis on five cross sections of industrials. The cross sections used were the first quarter of 1951, the second quarter of 1952, the fourth quarter of 1954, the fourth quarter of 1955, and the third quarter of 1956. (Examination of Moody's yields on outstandings had suggested that, during the first four of these cross sections, yields on the average had remained virtually stable, and in the fifth reasonably so.)

One regression of yield on the above variables was run for each cross section. The proportion of the total variation in yield explained (R^2) was: first quarter of 1951, .834; second quarter of 1952, .830; fourth quarter of 1954, .902; fourth quarter of 1955, .849; and third quarter of 1956, .700. I deemed these results to be reasonably satisfactory, especially since a small amount of variation in yields no doubt occurred during the quarters selected, and this was not taken account of at all. Moreover, certain variables showed themselves to be consistently significant, namely, earnings before interest and taxes, years nonrefundable, times charges earned, type of security, and industrial classification.

The next step will be to run regressions for the remaining cross sections for industrials and then, provided systematic results are obtained, to use those variables which show themselves to be consistently significant through the whole period to cross-classify yields. The result will be (on certain assumptions about the meaning of "quality") a set of homogeneous series on yields on industrials from one end of the period to the other.

The same procedure will then be followed for public utilities and finance companies. Work on the first draft of a manuscript will begin soon thereafter.

<div align="right">AVERY B. COHAN</div>

THE MORTGAGE MARKET

The study of the mortgage market is proceeding along two fronts: a cross-section study of the principal factors influencing the structure of mortgage yields, which employs existing data provided by the Federal Reserve Bank of Chicago and other sources; and a time series study that is compiling new historical data from the records of life insurance companies and perhaps other lenders. Morris Beck of Rutgers University joined the project on May 1, 1962.

In the cross-section study, analysis of about 8,200 conventional mortgage loans authorized in the Chicago area between May 1960 and January 1961 indicates that interest rates vary significantly by type of lender. Savings and loan associations obtain the highest rates, commercial banks the lowest, and mortgage company rates are in between. (Unfortunately, other lender groups do not have significant representation in Chicago.) The rate differences are larger when computed on an "effective" rate basis—that is, to include fees, commissions, and other charges connected with the extension of credit—than when only contract rates are considered. Part of the yield differentials can be attributed to differences in the characteristics of the loans these lenders make. The banks, for example, make more conservative, and presumably less risky, loans than the other lender groups. Apparently, however, the yield differentials are not entirely explained by differences in mortgage characteristics, and we hope to explore other possible explanations related to the institutional characteristics of the lender groups. As one example, there is a possibility that some mortgage loans by banks have a "tie-in" character, wherein banks view borrowers as potential customers for other services.

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The time series study is now well under way. We hope eventually to have reliable series on rates, loan-to-value ratios, and maturities for FHA, VA, and conventional loans, separately, with some further breakdown by geographic area. These series will be on a loans-authorized basis; i.e., they will refer to the month when loans were first authorized to builders or borrowers, thus avoiding the sizable and erratic time lag characteristic of series based on the month when loans are finally closed. The time series, which will probably extend back to 1951, will be based on a sample of loans authorized by specified life insurance companies. As a preliminary step, however, we are obtaining complete coverage of loans authorized by six large companies in selected months. Data on some 7,500 loans authorized in February, 1960 are now being processed, and work has begun on loans authorized in June 1953 by the same lenders. A comprehensive set of tabulations is planned for the February 1960 data. These tabulations will aid in the sample design by providing information on the structural characteristics of life insurance company mortgage loans. In addition, they will permit us to check certain findings of the cross-section study.

JACK M. GUTTENTAG
MORRIS BECK

THE QUALITY OF CREDIT IN BOOMS AND DEPRESSIONS

A summary report on these studies, which have been financed in large part by a grant from the Merrill Foundation for the Advancement of Financial Knowledge, is in preparation. It will consider problems of credit quality measurement, analysis, and recent trends in the wide range of credit markets covered by the investigation.

In order to fill the gap that exists in our current information on the relation between residential mortgage loan characteristics and loan experience, we have undertaken further

study in this sector with the assistance of grants from the Mortgage Bankers Association, the United States Savings and Loan League, and the National Association of Mutual Savings Banks.

The Quality of Bank Loans, by Albert M. Wojnilower, was published in 1962. Martin Seiden's manuscript, "The Quality of Trade Credit," has been submitted to the Board. Other reports in preparation include a manuscript on consumer credit quality by Geoffrey Moore and Philip Klein and an analysis of farm mortgage and production credit lending experience by George Brinegar. Thomas R. Atkinson reports below on his study of corporate bond quality.

For a brief review of the credit quality studies as a whole, see Part II.

JAMES S. EARLEY

POSTWAR CORPORATE BOND QUALITY

Two prominent characteristics of the corporate bond market in the postwar period are the prevalence of direct placements and, among public offerings, the frequency of issues convertible under certain conditions into common stock. By the late 1950's approximately half of the dollar volume of all corporate bond issues was placed without recourse to the public market, being taken, usually by negotiation, by one or a small group of institutional investors. Similarly, in some years since the end of World War II, convertible issues have equaled 15 per cent or more of total public issues. Because these characteristics have been so prominent, the question naturally arises as to how direct placement and convertibility are associated with bond quality.

Before examining the data for the postwar period, which, because of the paucity of actual defaults, is largely confined to inferential evidence using indirect quality measures, it is useful to examine the pertinent materials from W. Braddock Hickman's study of bond issues, 1900-1943. Special tabulations of the Hickman data accordingly were prepared, with particular

emphasis on the decade of the 1920's because of obvious similarity with recent years.

Direct placements were relatively rare in the period from 1900 to 1943, constituting only about 7 per cent of the total dollar volume of issues. Furthermore, in the decade of the 1920's they were only about 1 per cent of the total bond volume, being actually more important before 1920 and particularly after 1929, when it became difficult to market issues successfully. Because of the paucity of direct placements in the 1920's, default rates on this type of issue are suspect, but it seems clear that they had much better default experience than did all corporate bonds. For example, whereas in 1929 all corporate bonds suffered an annual default rate of 1 per cent (of outstandings defaulting), direct placements had a comparable rate of 0.15 per cent. The superior quality of direct placements showed in all quality measures such as earnings coverage, agency ratings, market ratings, and percentage secured.

In the postwar period it has been harder to judge the quality of direct placements and any possible trends. For the most part, they have not been rated by the recognized rating agencies, and neither the terms of the offering nor the financial data for the obligor have been available in public sources. One source of ratings has been the National Association of Life Insurance Commissioners, which attempts to rate direct placements held by life insurance companies for valuation and reserve amortization purposes. The total volume rated by this agency below the first four rating grades has been extremely small and rarely above 2 per cent of the total rated during the postwar period. No discernible trend seems evident in this percentage. A second potential source of quality measurements is the sample of 4,000 direct placements held by life insurance companies, obtained by Avery B. Cohan for the interest rate project described above. These data, however, have not yet been tabulated.

While convertible bond issues in 1900-1943 constituted only about 6 per cent of the total volume of corporate bond offerings, they enjoyed a heyday in a few years of the 1920's. In 1929, for example, they constituted 40 per cent of all issues. For both the decade of the 1920's and the 1930's, convertible bonds had a default rate roughly twice that of all corporate bonds. Of all convertible issues in 1929, 52 per cent went to default prior to 1944; only 34 per cent of all bonds met this fate. Proportionately fewer convertible bonds had high agency rating grades or were secured than was the case for nonconvertible bonds. Perhaps it is not surprising that convertible bonds generally bore better market ratings (proportion of dollar value of issues offered that yielded less than 100 basis points in excess of the basic corporate bond yield) than nonconvertible bonds.

In the postwar period, as already noted, default experience has been negligible. Nevertheless, the rating agencies have generally tended to give convertibles ratings below investment grade more often than in the case of nonconvertible bonds. The evidence suggests that the

TABLE IV.10

Proportion of Corporate Bonds
with Low Agency Ratings, 1920-29 and 1956-59,
by Conversion Feature and Type of Distribution

(per cent below investment grade)

	1920-29	1956-59
Convertibles	26.9	30.0
Nonconvertibles	18.2	2.7
Direct placements	2.0	1.0
Public offerings	16.3	5.4
All offerings	16.4	4.1

Source: NBER tabulations.

feature of convertibility is often used to market issues less well secured or with poorer earnings coverage than in the case of orthodox issues.

One major finding of the study is that, in general, the quality of postwar corporate bond offerings is far higher than that observed in the 1920's. As Table IV.10 shows, the percentage of volume of bond issues receiving agency ratings below the first four classes (investment grade) has been cut by a factor of four. Part of the improvement is obviously associated with the rise in direct placements, although this trend is offset modestly by the greater importance of convertibles in the postwar period. Even so, there has been a remarkable improvement in the ratings of nonconvertible bonds and publicly offered issues. Generally, agencies rated one-fourth to one-third of all convertible issues as below investment grade in both periods.

The broadest measures suggest that there has been a deterioration in the quality of publicly offered issues since the end of World War II, although, as mentioned above, the quality as measured by most standards remains far higher than was generally achieved prior to World War II. Moreover, the postwar deterioration is by no means rapid and, in view of the mildness of recent recessions, there is considerable question whether it is appropriate to speak of quality deterioration in the sense of increased likelihood of default. At least to the present, it is possible that the observed deterioration of corporate bond quality merely reflects the return to normal from the extremely favorable conditions of most obligors upon emerging from World War II. In addition, the response of investors, largely institutional, in encouraging less rigid standards by their willingness to purchase bond instruments may reflect, in part, the lesson of Hickman's study that investors able to diversify could obtain higher realized yields (after losses) on less than prime corporate bonds.

THOMAS R. ATKINSON

THE INDIVIDUAL INCOME TAX

Seven studies of various elements of the federal individual income tax have been conducted under my general direction during the past several years. Three of them have been published: my *Interest as a Source of Personal Income and Tax Revenue* (1955), C. Harry Kahn's *Personal Deductions in the Federal Income Tax* (1960), and Daniel M. Holland's *Dividends Under the Income Tax* (1962). A fourth, Kahn's "Business and Professional Income Under the Individual Income Tax," is now in preparation, and a fifth, my manuscript on "The Personal Exemptions in the Federal Income Tax," will shortly be submitted to the Board of Directors for approval. Kahn is well along on a study of "Income from Employment Under the Individual Income Tax," and I have completed most of the statistical work for an Occasional Paper that will update and supplement my 1950 volume, *The Nature and Tax Treatment of Capital Gains and Losses.*

Because I have received many requests for recent figures corresponding to those presented in Table 1 of my 1950 volume, I present them in the appended Table IV. 11 for 1943-60. These figures show the totals of realized capital gains and losses reported on all individual income tax returns, adjusted to preserve homogeneity in an economic sense as far as possible in the face of various changes in the statute from time to time. They were derived from *Statistics of Income* in the manner described in the Appendix of the 1950 volume (particularly pages 362-364). Thus they include the whole of the excess of a taxpayer's long-term capital gain over his short-term and long-term capital losses instead of only the statutory proportion of 50 per cent, the whole of his net capital loss in any year instead of only up to the $1,000 allowed by the statute, and his net gain and loss from sales of depreciable assets and real property used in business. For the years beginning with 1953, they exclude the capital gains and losses of fiduciaries because consecutive annual figures for such returns are no longer published.

The amounts of realized net capital gains reported on individual income tax returns in recent years have far exceeded any previously reported in the history of the federal income tax. In 1928 and 1929, the culminating years of the great stock market boom of the 1920's,

TABLE IV.11

NET CAPITAL GAINS AND LOSSES,
ANNUAL TOTALS ON TAXABLE AND NONTAXABLE INDIVIDUAL RETURNS, 1943-60

(million dollars)

	Total Net Gain on Returns with Net Gains	Total Net Loss on Returns with Net Loss	Excess of Net Gain
1943	1,772	715	1,057
1944	2,462	860	1,602
1945	4,876	609	4,267
1946	7,255	611	6,644
1947	5,220	837	4,383
1948	5,320	938	4,382
1949	4,172	1,072	3,100
1950	6,931	873	6,058
1951	6,995	757	6,238
1952	6,100	927	5,172
1953[a]	5,031	1,207	3,823
1954[a]	7,352	787	6,565
1955[a]	10,058	852	9,206
1956[a]	9,822	1,090	8,732
1957[a]	8,252	1,392	6,860
1958[a]	9,614	1,114	8,500
1959[a]	13,335	1,119	12,216
1960[a]	11,886	1,592	10,294
1943-60[b]	126,455	17,355	109,700
1955-60[b]	62,968	7,160	55,808

[a] Excludes fiduciary returns.
[b] Totals may differ slightly from sums of the annual figures because of rounding.

the net capital gains reported by individuals totaled $4.9 billion and $4.8 billion, respectively, and the excess of net capital gains over net capital losses, $4.5 billion and $2.9 billion. In the six years ending with 1960, individuals' net capital gains totaled $63 billion, or an average of over $10 billion a year, and their net losses averaged only $1.2 billion a year.

Net capital gains exceeded net capital losses by substantial amounts on all individual returns combined in every one of the eighteen years 1943-60. In contrast, in the preceding fifteen years, 1928-43, there were only three years in which this was true. The total of individuals' net capital gains in 1943-60 was $126.5 billion; their net capital losses aggregated $17.4 billion; and the excess of their gains over losses, $109.1 billion. In all recent years the excess of net capital gains over net capital losses reported has materially exceeded the amounts of interest and rents and royalties and, in some years, the amounts of dividends.

LAWRENCE H. SELTZER

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WAGES AND SALARIES

I have completed a manuscript on "Income from Employment Under the Individual Income Tax" and it is now in the hands of a reading committee. The aim of the study is to give an account of the extent to which employment income is encompassed by the income tax, and to show how specific provisions applicable to wages and salaries may have affected their share in tax liability. A comparison of total reported and total estimated wages and salaries (adjusted to conform to income tax definitions) shows two striking results: (1) the coverage of employment income is exceedingly high—97 per cent for recent years—and accounts for much of the high coverage of income in general under the individual income tax; (2) there is little evidence that this high coverage can be attributed to withholding at the source, as has frequently been done and as I had expected to find.

The greatest increase in coverage occurred shortly before the introduction of withholding in 1943: from 36 per cent in 1939 to 86 per cent in 1942. It is not even clear that the remaining 11-point rise in coverage can simply be attributed to the withholding device, for over the period 1943-60 the coverage of non-employment income also rose by 8 percentage points (from 61 to 69 per cent). This is not to say that withholding has not accomplished other important objectives, such as the current payment of tax, but merely that credit for the high coverage of wages and salaries may be largely due to other factors.

In addition to wages and salaries, employees reported modest amounts of other income. For 1960 this is estimated at only 7.5 per cent of total reported income (AGI). The trend in this ratio has been well-nigh horizontal for the past twenty years: 1941, 8.7; 1947, 7.2; 1951, 7.0; 1956, 7.9; 1960, 7.5

These percentages, based on *reported* income, omit the rising amounts of property income which employees have had in recent years on their equity in group retirement plans and annuities. Indeed, because of the rising importance of these omissions, one might have expected the reported ratio for "other income" to drop in the postwar period. Its failure to do so provides some additional support for recent findings (such as Cagan's) that the growth of pension plans may have had the effect of increasing individual savings ratios.

My manuscript on "Business and Professional Income Under the Individual Income Tax" has been approved by the Directors. It has been edited, and final revisions are nearly completed.

C. HARRY KAHN

OTHER STUDIES

Capital and Rates of Return in Manufacturing Industries, by George J. Stigler, and *A Monetary History of the United States, 1867-1960,* by Milton Friedman and Anna J. Schwartz, are in press. *The State of Monetary Economics,* a conference proceedings report, was published recently as a supplement to the *Review of Economics and Statistics.*

"Studies in the National Balance Sheet of the United States," by Raymond W. Goldsmith and Robert E. Lipsey, has gone to press, and "The Flow of Capital Funds in the Postwar Economy," by Raymond W. Goldsmith, is being prepared for press. "Corporate Sources and Uses of Funds," by David Meiselman and Eli Shapiro, is being readied for submission to the Board. Manuscripts on "The Market for Corporate Securities and Loans," by Eli Shapiro, and on "Risks and Returns in Small Business Financing," by Geoffrey H. Moore and Thomas R. Atkinson, are in preparation.

Reports on other studies of financial institutions and processes appear in each of the other sections of Part IV.

5. INTERNATIONAL ECONOMIC RELATIONS

THE UNITED STATES IN A CHANGING WORLD ECONOMY

An explanatory essay, *Problems of the United States as World Trader and Banker,* was drafted during 1962 and published in March 1963. This study, the first to emerge from a program of research started by the National Bureau in 1960 with the assistance of a grant from the Rockefeller Foundation, inaugurates a new National Bureau series of Studies in International Economic Relations. The report, though animated largely by the purpose of identifying problems on which further research is needed, seeks to present in summary form the main facts about recent changes and present problems in the international financial position of the United States.

On the basis of this introductory study, my efforts will now be directed mainly toward the further development of the National Bureau's research program in the international field. The present status of our work and plans is described in Part II. Reports follow on several studies which are under way.

HAL B. LARY

UNITED STATES PERFORMANCE IN INTERNATIONAL COMPETITION

In the final analysis, a nation's competitiveness may be judged by its actual performance in world trade. The purpose of this project is therefore to see what conclusions can be drawn from a close and systematic analysis of international trade data with respect to the competitive position of the United States.

So far, the work has consisted mainly of compiling basic data in the form needed for the analysis. This has included the arrangement of import statistics covering the period 1950-61 by end-use categories for a number of foreign countries that account (together with the United States) for by far the greater part of world trade and industrial production. The end-use categories and the countries covered are indicated in Table IV.12.[1] Production statistics drawn mainly from national sources have been compiled according to similar categories, and data on national income by industrial origin are also being assembled on the same basis. Divergences in reporting methods and inadequacies of published detail make progress in this work slow, but it is expected that by mid-1963 most of the data will be compiled. Production and income statistics for each country will then be related to imports, both from the United States and from other sources, in an effort to measure and analyze such substitutions as have taken place to the advantage or disadvantage of United States products.

We are not yet in a position to begin to draw conclusions from the data being assembled, particularly since we cannot yet relate our trade materials to statistics of national expenditure. Moreover, our approach is motivated by the belief that conclusions are sometimes too readily drawn from highly aggregated data and need instead to be built upon a careful study of the details. It may nevertheless be of interest, and also point to the usefulness of a more detailed analysis, to make some comparisons based only on what can be observed in the trade data.

Table IV. 12 gives a summary view of imports by main end-use categories of leading foreign industrial countries in 1953-55 and 1960-61. Relative rates of increase of these imports from the United States and from other sources are plotted in Chart 4. The 45-degree line in the chart gives the locus of points marking identical percentage increases in imports from these two sources. Any point above that line therefore represents a relative gain, and any point below it a relative loss, for the United

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[1] A complete allocation of all trade items by end-uses is, however, scarcely possible, notably in the case of chemicals, fuels, and metal products.

TABLE IV.12

IMPORTS OF LEADING FOREIGN INDUSTRIAL COUNTRIES,[a] 1953-55 AND 1960-61

	Imports from All Sources			Share Supplied by U.S. (per cent)	
	1953-55 (annual averages in million dollars)	1960-61	Increase (per cent)	Of Total Imports in 1953-55	Of Increase from 1953-55 to 1960-61
I. All foreign industrial countries included in analysis					
Total imports[b]	37,253	60,357	62.0	19.1	18.7
Food and beverages (0)	8,422	10,632	26.2	9.8	18.8
Fuels and lubricants (1)	4,626	7,075	52.9	14.8	-1.8
Chemicals (2)	551	1,236	124.3	30.4	30.2
Materials used in agriculture (3)	677	1,056	56.0	11.4	18.2
Materials used for the production of nondurables (4)	8,322	11,355	36.4	17.5	28.3
Building materials excluding metals (5)	1,429	2,356	64.9	8.4	10.4
Materials used for the production of durables (6)	6,026	10,884	80.6	15.2	17.9
Manufactures of metals including ordnance (7)	585	928	73.4	40.7	18.3
Capital equipment (8)	4,151	8,944	115.5	45.8	30.0
Consumer manufactures (9)	2,145	5,223	143.5	26.9	13.6
Finished manufactures[c]	7,383	16,361	121.6	38.8	23.8
Crude materials and semimanufactures[d]	29,503	43,358	47.0	13.8	16.3
II. Canada					
Total imports[e]	4,261	5,557	30.4	72.4	47.8
Finished manufactures[c]	2,228	3,064	37.5	85.2	50.6
Crude materials and semimanufactures[d]	2,033	2,494	22.7	58.4	42.5
III. Western European countries and Japan					
Total imports[e]	32,624	54,185	66.1	11.8	17.7
Finished manufactures[c]	5,154	13,321	158.4	18.7	21.3
Crude materials and semimanufactures[d]	27,470	40,865	48.8	10.5	15.5

[a] Countries included are: Austria, Belgium-Luxembourg, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Sweden, and the United Kingdom.

[b] Includes miscellaneous imports (electrical energy, postal packages, live animals not for food, returned goods, personal effects of travelers and immigrants, and other special cases).

[c] Sum of end-use categories 2, 7, 8, and 9.

[d] Sum of end-use categories 0, 1, 3, 4, 5, and 6.

[e] Excludes miscellaneous imports.

CHART 4

Leading Foreign Industrial Countries: Comparative Percentage Increases in Imports, by End-Use Categories, from United States and Other Sources, 1953-55—1960-61

Increase in imports from U.S. (per cent)

Increase in imports from other sources (per cent)

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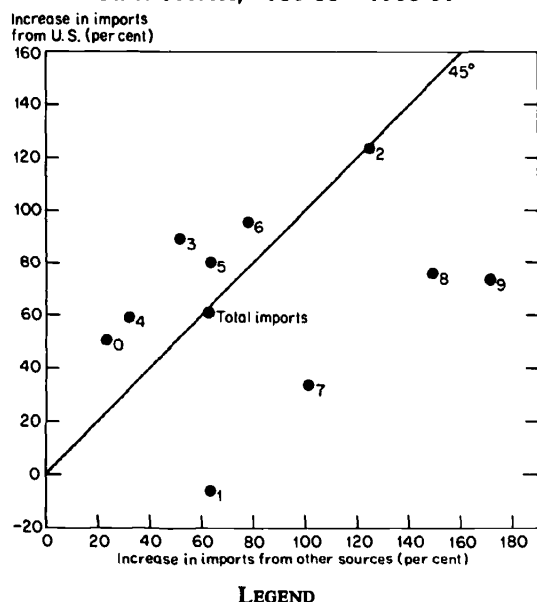
0. Food and beverages
1. Fuels and lubricants
2. Chemicals
3. Materials used in agriculture
4. Materials used for production of nondurables
5. Building materials, excluding metals
6. Materials used for production of durables
7. Manufactures of metals, including ordnance
8. Capital equipment
9. Consumer manufactures

NOTE: For countries included, see Table IV.12.

States. It is of interest to note that all of the points above the 45-degree line relate to crude materials and semimanufactures. Among the groups here classified as finished manufactures, chemicals fall on the 45-degree line, but the other three (as well as fuels and lubricants) are well below the line. As may be seen in Table IV .12, the United States has in particular failed to share proportionately in the great increases in imports of capital equipment and consumer manufactures by other industrial countries.

The foregoing suggests that the United States has fared better in products with a low than in those with a high degree of fabrication. Such a conclusion would, however, require some qualification in the light of the data given in the lower part of Table IV. 12. It will be observed that imports into Canada, our most important single market, have behaved quite differently from those of other countries included in the tabulation and have markedly affected the over-all totals. During the period covered, Canada increased its imports, and especially its imports from the United States, much less than other industrial countries, with the result that Canada's share in total imports of this group of countries from the United States declined from 43 per cent in 1953-55 to 32 per cent in 1960-61. Though the United States still accounts for two-thirds of total Canadian imports, it has supplied less than 50 per cent of the gain since 1953-55. The change, though important in crude materials and semimanufactures, has been particularly marked in finished manufactures, for which Canada in 1953-55 was almost twice as large a market for the United States as all the other countries covered in the present analysis.

Given the exceptional importance of the Canadian market to the United States, these changes need to be studied in much more detail and a search made for their causes and significance. In the meantime, it is of interest to see that in industrial countries exclusive of Canada the United States has succeeded in increasing its share of the market both for finished manufactures and for other products. Among finished manufactures, the great strength of the United States in these markets has been in capital equipment. As shown in Table IV. 13, the United States held close to one-fourth of the import market for capital goods in these countries in 1953-55 and retained this share in the subsequent expansion. Its strength in this field extended to all of the major subgroups, with the notable exception of road motor vehicles (Chart 5). Quite the opposite is true with respect to the same countries' rapidly growing import markets for consumer manufactures, in which the United States has singularly failed to participate (Chart 6). The discrimination long practiced

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TABLE IV.13

IMPORTS OF CAPITAL EQUIPMENT AND CONSUMER MANUFACTURES BY
LEADING FOREIGN INDUSTRIAL COUNTRIES, EXCLUDING CANADA, 1953-55 AND 1960-61[a]

	Imports from All Sources			Share Supplied by U.S. (per cent)	
	1953-55 (annual averages in million dollars)	1960-61	Increase (per cent)	Of Total Imports in 1953-55	Of Increase from 1953-55 to 1960-61
I. *Capital equipment, total* (8)	2,770	7,064	155.0	23.2	23.5
Electrical machinery, apparatus, and appliances (80)	496	1,584	219.2	15.3	14.7
Office machinery (81)	107	411	283.6	35.5	36.2
Agricultural machinery and tractors (82)	134	310	132.1	11.9	11.3
Power generating machinery excluding electrical (83)	242	601	147.9	22.7	34.1
Metal-working machinery (84)	286	592	107.3	36.4	32.5
Mining, construction, and other industrial machinery (85)	912	2,325	155.0	21.3	18.7
Road motor vehicles other than passenger cars (86)	286	442	53.8	23.8	-3.9
Aircraft, railway vehicles, and ships (87)	307	799	160.3	41.5	49.1
II. *Consumer manufactures, total* (9)	1,598	4,309	169.6	16.5	3.9
Passenger cars (90)	246	830	237.4	11.0	3.4
Other durable consumer goods (91)	591	1,360	130.1	11.7	-1.6
Clothing (92)	174	495	185.1	4.0	3.8
Footwear and textile manufactures other than clothing (93)	154	376	144.0	3.6	.2
Medical and pharmaceutical products (94)	110	258	134.5	25.5	18.8
Other nondurable consumer manufactures (95)	323	990	206.8	39.6	8.6

[a] Countries included are: Austria, Belgium-Luxembourg, Denmark, France, Germany, Italy, Japan, Netherlands, Sweden, and the United Kingdom.

CHART 5

Leading Foreign Industrial Countries, Excluding Canada: Comparative Percentage Increases in Imports of Capital Equipment, by Main Groups, from United States and Other Sources, 1953-55—1960-61

Increase in imports
from U.S. (per cent)

Increase in imports from other sources (per cent)

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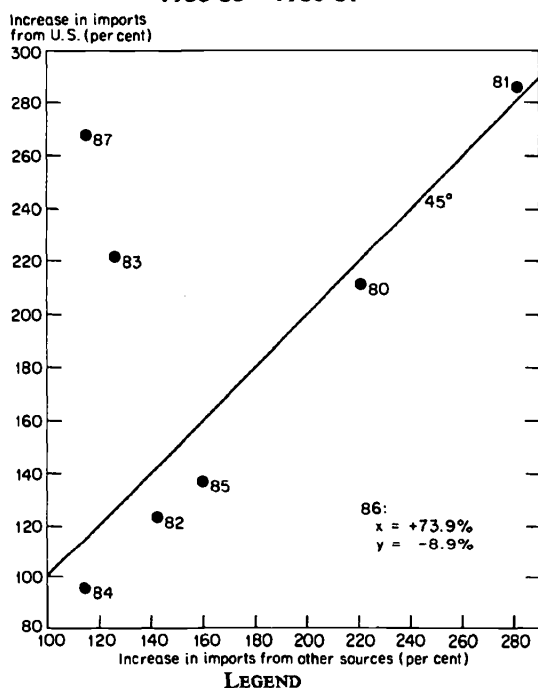
80. Electrical machinery, apparatus, and appliances
81. Office machinery
82. Agricultural machinery and tractors
83. Power-generating machinery
84. Metalworking machinery
85. Mining, construction, and other industrial machinery
86. Road motor vehicles other than passenger cars
87. Aircraft, railway vehicles, and ships

NOTE: For countries included, see Table IV.13.

CHART 6

Leading Foreign Industrial Countries, Excluding Canada: Comparative Percentage Increases in Imports of Consumer Manufactures, by Main Groups, from United States and Other Sources, 1953-55—1960-61

Increase in imports
from U.S. (per cent)

Increase in imports from other sources (per cent)

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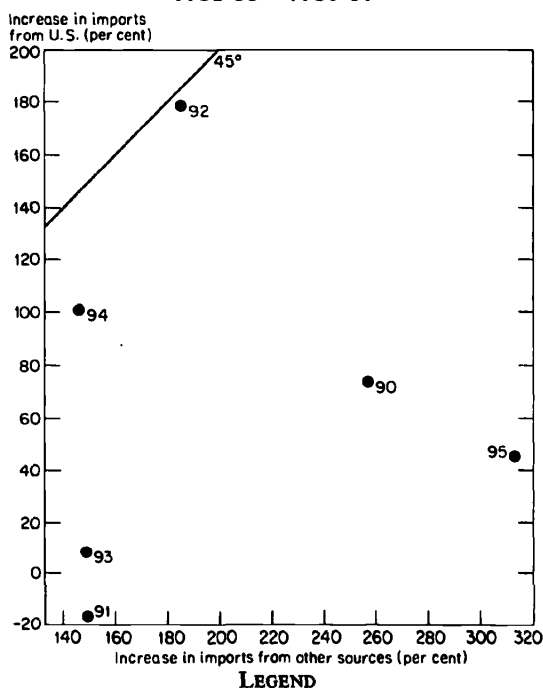
90. Passenger cars
91. Other consumer durable manufactures
92. Clothing
93. Footwear and textile manufactures other than clothing
94. Medicinals and pharmaceuticals
95. Other nondurable consumer manufactures

NOTE: For countries included, see Table IV.13.

in many foreign countries against imports of nonessentials undoubtedly made it difficult for American producers to gain a footing in the consumer goods area, but the reasons for the continuing weakness of these exports need to be further studied.

H. G. GEORGIADIS

INTERNATIONAL PRICE COMPARISON STUDY

The study, financed by a grant from the National Science Foundation, is an investigation of relative prices and price changes and their influence on the composition and direction of world trade in manufactured goods. It will concentrate first on the competitiveness of the economy as indicated by the level and trends of United States prices of manufactured products compared with those of other major exporters, but it is hoped that methods of general applicability will be developed and tested.

One part of the study will involve the compilation of time series on export prices of internationally traded goods; these will be in the form of index numbers for the United States and for foreign competitors. A comparison of

the U.S. and foreign indexes should help to explain the role of relative price changes in determining shifts of trade in manufactures as a whole and in particular groups of products.

Another aspect will be country-to-country comparisons at a given point in time. These cross-sectional comparisons should account for part of the current pattern of trade, and changes in them should explain, in the same way as comparisons of the time series, shifts in the pattern of trade associated with price differentials.

American firms are being canvassed for data on actual prices or price quotations in foreign trade transactions. Firms which procure abroad are being asked to compare the prices at which the same product is offered to them by different countries. Firms which export or produce abroad are being asked about their own and their competitors' prices. Another inquiry planned is on the levels of bids received from various countries by government agencies which invite bidding for contracts. It is also planned to seek price information from foreign sources.

Our efforts so far have been devoted to interviewing about a hundred American firms to ascertain the availability of price information. Large companies engaged in world-wide operations have provided extensive comparative price data originally gathered for their own use, and other firms have given information on specific products. Up to this point, work has been concentrated in the sector of machinery and manufactured metal products.

A memorandum describing the objectives and methods of the study has been circulated for discussion and comment.

IRVING B. KRAVIS
ROBERT E. LIPSEY
PHILIP J. BOURQUE

FOREIGN TRADE AND BUSINESS CYCLES

The aim of this study is to advance our knowledge about the nature and causes of cyclical fluctuations in foreign trade. Reports dealing with the trade balances of the United States and the United Kingdom, and with the total value of United States exports since 1880, have been published. At present I am engaged in an analysis of cycles in the major classes of export goods, distinguishing between changes in prices and changes in quantities. After studying the behavior of the parts, I am able to explain better than in the earlier study the behavior of total exports, which is so important from the balance-of-payments point of view. I hope to submit a manuscript to the staff reading committee in a few months. It will cover the following topics:

Export Prices

The Literature on Export Prices in Business Cycles

The Actual Behavior of U.S. Export Prices in U.S. Business Cycles; Their Conformity, Amplitude, Pattern

The Effects of World Cycles on the Cyclical Patterns of U.S. Export Prices

Export Quantities and Values

General Considerations Regarding the Movements of Export Quantities and Values in Business Cycles

The Timing of Turning Points in U.S. Exports

The Rise and Fall in Exports During World Cycles

The Relations Between Export Movements and U.S. Business Cycles

The Combined Impact of World and Domestic Cycles on Exports

My attention during recent months has been devoted mainly to an analysis of the timing of peaks and troughs in the quantities and values of major export classes and of total exports. I have tried to find answers to such questions as: What are the main causes of export turns? Of turns in foreign demand? In competing domestic demand? In supply? Are export turns more likely at one stage of U.S. business cycles than at another? How does the timing of turns differ between commodity classes and time periods? Foreign demand is, according to my findings, the most important force causing reversals in exports. With few exceptions, turns up or down in the total imports of foreign countries are matched by corresponding turns

in our exports. Short leads and lags differ between commodity classes. Exports of crude materials and foods tend to turn down before peaks in world imports are reached, and exports of finished manufactures tend to turn up before troughs. There is no evidence by this standard of any recent change in the "competitiveness" of United States exports, such as might be suggested if they lagged longer behind upturns in world imports at the trough or fell sooner at the peak.

Though a reversal in world trade is typically associated with a like one in United States exports, about one-third of the turns in the latter do not match turns in world trade. Are these extra turns caused by the swings in domestic business activity? The answer, in the majority of instances, is that domestic demand is an important factor. What is the evidence for this interpretation? When, say, a trough in the quantity of crude materials exports coincides with a peak in their prices and also with a peak in the domestic business cycle, it appears likely that the weakening of domestic demand contributes to the softening of prices and the revival of exports. This view is supported by contemporary comments on the course of events.

The frequency of export turns due to domestic rather than to world cycles differs widely between commodity classes and from one period to another. Such turns virtually never occur in exports of finished manufactures, which reverse their direction almost exclusively when world imports do. This has the important implication that an expansion of domestic demand does not stop a rise in these exports, nor does a downturn in domestic business bring a revival.

Exports of crude materials, on the other hand, turned up almost every time domestic business fell back from a peak prior to World War I. That declining home demand contributed to the revival of exports in these instances is affirmed by a simultaneous softening of prices. Similarly, domestic expansion almost unfailingly brought the growth of crude material exports to a halt, and again one finds that price troughs were associated with quan-tity peaks. Rather surprisingly, the inverse relation of crude materials exports to domestic business cycles was frequently reinforced from the supply side. Of these exports 50 to 60 per cent consisted of cotton in those years, and cotton crops moved opposite to business cycles. Thus exports often fell in business expansions, owing both to rising home demand and to falling supply, and the opposite occurred at times of business contraction.

The declining role of cotton and the closer synchronization of United States and world cycles, along with other factors, caused turns in crude materials exports to occur less often at opposite turns in U.S. business cycles after World War I, and never in the 1950's. This shift in behavior accounts for much of the shift in the movement of total export value toward positive conformity with domestic business cycles.

Food exports are less likely than raw materials to be affected by variations in domestic demand. Nevertheless, before World War I, almost half of all turns in the quantity of food exports were associated with opposite turns in the business cycle. This inverse relation was also present to some extent in the interwar period. Since World War II, however, large stockpiles have countered the effects of changes in domestic demand on exports, and government programs have had procyclical effects at some troughs, so that turns in food exports have lately tended to occur near like turns in domestic business cycles.

The upshot of this diverse behavior of the various commodity classes for the timing of turns in total export quantity is as follows: from 1879 to 1913, when exports consisted largely of crude materials and foods, about half of the peaks and troughs in the total match opposite turns in U.S. business cycles, and most of the remainder match like turns in the world cycle.

In more recent periods, the inverse effect of the domestic cycle on exports of crude materials and foods has weakened, and finished manufactures, which even in earlier years did not shift in a direction opposed to the domestic business cycle, have become the largest export

class. With the lessened interference of cyclical swings in the United States, most turns in total exports are now associated with turns in world imports, which also often places them near like turns in the domestic business cycle. Government policies with regard to agricultural exports at times reinforce the positive relation of total exports and domestic business cycles, particularly at troughs. Hence, the most likely location of total export turns after World War II is in the vicinity of like turns in U.S. business cycles.

ILSE MINTZ

OTHER STUDIES

Following circulation to outside readers for comment, Herbert B. Woolley's manuscript, "Measuring Transactions Between World Areas," is now being revised and made ready for submission to the Directors. Walther P. Michael's supporting study of "International Capital Movements, 1950-54," is well advanced; revisions of the estimates in matrix form have been completed, three chapters of an introductory and methodological nature are in draft, and much of the drafting has been completed on the chapters comprising the main part of the analysis.

Robert E. Lipsey's *Price and Quantity Trends in the Foreign Trade of the United States* was published as No. 2 in Studies in International Economic Relations.

AUTHORS OF STUDIES COMPLETED OR IN PROCESS DURING 1962-63

MOSES ABRAMOVITZ, A.B. Harvard, Ph.D. Columbia; prof. econ. Stanford, temp. with OECD, Paris; NBER since 1938; pubs.: *Inventories and Business Cycles* (1950); *Resource and Output Trends in the U.S. since 1870* (1956).

THOMAS R. ATKINSON, B.A. Denison, M.A., Ph.D. Wisconsin; econ. Scudder, Stevens & Clark; NBER since 1949; pub.: *The Pattern of Financial Asset Ownership* (1956).

GARY S. BECKER, A.B. Princeton, Ph.D. Chicago; prof. econ. Columbia; NBER since 1957; pubs.: *The Economics of Discrimination* (1957); "Irrational Behavior and Economic Theory" (*JPE*, Feb. 1962).

CHARLOTTE BOSCHAN, B.S. N.Y.U., M.A. Columbia; NBER since 1952; pubs.: "Economic Projections to 1975," in *The Economy of New Jersey* (1958); "Application of Electronic Computers to Business Cycle Research" (with G. Bry, ASA, *Proceedings*, 1960).

PHILIP J. BOURQUE, Ph.D. Pennsylvania; prof. bus. econ. Washington; NBER since 1962; pubs.: "The Domestic Importance of Foreign Trade of the U.S." (*RES*, Nov. 1954); "Regional Patterns of Seasonality in the Labor Force and Its Components" (*QREB*, Nov. 1962).

WILLIAM H. BROWN, B.A., Ph.D. Yale; assoc. prof. econ. Swarthmore; NBER since 1960; pubs.: "Innovation in the Machine Tool Industry" (*QJE*, Aug. 1957); *Planning Municipal Investment* (with C. H. Gilbert, 1961).

GERHARD BRY, Ph.D. Columbia; prof. econ. N.Y.U.; NBER since 1940; pubs.: *The Average Workweek as an Economic Indicator* (1959); *Wages in Germany, 1871-1945* (1960).

ARTHUR F. BURNS, A.B., A.M., Ph.D. Columbia; John Bates Clark prof. econ. Columbia; NBER since 1930; pubs.: *Measuring Business Cycles* (with W. Mitchell, 1946); *Frontiers of Economic Knowledge* (1954).

PHILLIP CAGAN, A.A. U.C.L.A., M.A., Ph.D. Chicago; prof. econ. Brown; NBER since 1953; pubs.: "Monetary Dynamics of Hyperinflation," in *Studies in the Quantity Theory of Money* (1956); *The Demand for Currency Relative to Total Money Supply* (1958).

NOTE: Authors of conference papers or committee reports published or in preparation during 1962 are not included.

AVERY B. COHAN, B.A. Cornell, M.A., Ph.D. Columbia; prof. fin. North Carolina; NBER 1942 and since 1961; pubs.: *Private Placements and Public Offerings* (1961); *Cost of Flotation of Long-Term Corporate Debt Since 1935* (1961).

JOSEPH W. CONARD, B.A. Grinnell, M.A., Ph.D. California (Berkeley); prof. econ. Swarthmore; NBER since 1960; pub.: *An Introduction to the Theory of Interest* (1959).

FRANK G. DICKINSON, B.A. Illinois, M.A. Penn State, Ph.D. Illinois; prof. econ. Northern Illinois; NBER since 1959; pubs.: "Public Works and Cyclical Unemployment" (*Annals Am. Acad. Pol. & Soc. Sci.* Suppl., Sept. 1928); *Philanthropy and Public Policy* (editor, 1962).

JAMES S. EARLEY, B.A. Antioch, M.A., Ph.D. Wisconsin; prof. econ. Wisconsin; NBER since 1959; pubs.: *Pricing for Profit and Growth* (1957, 2nd ed. 1961); "Marginal Policies of 'Excellently Managed' Companies" (*AER*, March 1956).

RICHARD A. EASTERLIN, M.E. Stevens Institute, A.M., Ph.D. Pennsylvania; prof. econ. Pennsylvania; NBER since 1955; pubs.: *Population Redistribution and Economic Growth, United States, 1870-1950*, I, II (coauth., 1957, 1960); *The American Baby Boom in Historical Perspective* (1962).

SOLOMON FABRICANT, B.C.S. N.Y.U., B.S. C.C.N.Y., A.M., Ph.D. Columbia; prof. econ. N.Y.U.; NBER since 1930; pubs.: *Capital Consumption and Adjustment* (1938); *The Trend of Government Activity in the United States since 1900* (1952).

ALBERT FISHLOW, B.A. Pennsylvania; asst. prof. econ. California (Berkeley); NBER since 1963; pubs.: "Trustee Savings Banks, 1817-1861" (*JEH* March 1961); "Resource Allocation in an Imperfect Market Setting" (with P. A. David, *JPE*, Dec. 1961).

MILTON FRIEDMAN, B.A. Rutgers, M.A. Chicago, Ph.D. Columbia; prof. econ. Chicago; NBER since 1937; pubs.: *A Theory of the Consumption Function* (1957); *A Monetary History of the United States, 1867-1960* (with A. J. Schwartz, in press).

VICTOR R. FUCHS, B.S., M.A. N.Y.U., Ph.D. Columbia; assoc. prof. econ. Columbia; NBER since 1962; pubs.: *Concepts and Cases in Economic Analysis* (with A. Warner, 1958); *Changes in the Location of Manufacturing in the United States since 1929* (1962).

HOURMOUZIS G. GEORGIADIS, B.A., Ph.D. Cornell; Jonathan Dickinson Preceptor, asst. prof. econ. Princeton; NBER since 1961; pub.: *Balance of Payments Equilibrium* (1963).

RAYMOND W. GOLDSMITH, Ph.D. Berlin; prof. econ. Yale; NBER since 1951; pubs.: *Financial Intermediaries in the American Economy* (1958); *The National Wealth of the United States in the Postwar Period* (1962).

MICHAEL GORT, A.B. Brooklyn, A.M., Ph.D. Columbia; prof. econ. Buffalo; NBER since 1954; pubs.: "Systematic Errors in Budgeting Capital Outlays" (*RES*, Feb. 1962); *Diversification and Integration in American Industry* (1962).

MANUEL GOTTLIEB, B.A. Minnesota, M.A. California (Berkeley), Ph.D. Harvard; assoc. prof. econ. Wisconsin; NBER since 1961; pubs.: "Theory of an Economic System" (*AER*, May 1953); "Value and Price in Industrial Markets" (*EJ*, Mar. 1959).

ZVI GRILICHES, B.S. California (Berkeley), Ph.D. Chicago; assoc. prof. econ. Chicago; NBER since 1959; pubs.: "Hybrid Corn: An Exploration in the Economics of Technological Change" (*Econometrica*, Oct. 1957); "Hedonic Price Indexes for Automobiles," in *The Price Statistics of the Federal Government* (1961).

JACK M. GUTTENTAG, B.S. Purdue, M.S., Ph.D. Columbia; assoc. prof. fin. Pennsylvania; NBER since 1961; pubs.: "The Short Cycle in Residential Construction, 1946-59" (*AER*, June 1961); *The Federal National Mortgage Association* (1962).

CHALLIS A. HALL, JR., B.S. Kansas, A.M., Ph.D. Harvard; assoc. prof. econ. Yale; NBER since 1961; pubs.: *Effects of Taxation on Executive Compensation and Retirement Plans* (1951); *Fiscal Policy for Stable Growth* (1960).

GEORGE HANC, B.S., M.A., Ph.D. Columbia; asst. dir. res. Nat. Assn. of Mut. Savings Bks.; NBER 1952-54 and since 1959; pub.: *United States Savings Bond Program in the Postwar Period* (1962).

MILLARD HASTAY, B.A. Reed, Ph.D. Columbia; prof. econ. Washington State; NBER since 1946; pubs.: "The Cyclical Behavior of Investment," in *Regularization of Business Investment* (1954); "The Formation of Business Expectations About Outlook and Operating Variables," *Quality and Economic Significance of Anticipations Data* (1960).

DANIEL M. HOLLAND, B.A., Ph.D. Columbia; prof. fin. M.I.T.; NBER since 1949; pubs.: *The Income-Tax Burden on Stockholders* (1958); *Dividends Under the Income Tax* (1962).

THOR HULTGREN, A.B., M.A. Columbia; NBER since 1940; pubs.: *American Transportation in Prosperity and Depression* (1948); *Changes in Labor Cost During Cycles in Production and Business* (1960).

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F. THOMAS JUSTER, B.S. Rutgers, Ph.D. Columbia; NBER since 1957; pubs.: *Consumer Expectations, Plans, and Purchases* (1960); "Prediction and Consumer Buying Intentions" (*AER*, May 1961).

C. HARRY KAHN, B.A. Vanderbilt, M.A., Ph.D. Wisconsin; prof. econ. Rutgers; NBER since 1952; pubs.: "The Stability of State and Local Tax Yields" (with H. M. Groves, *AER*, Mar. 1952); *Personal Deductions in the Federal Income Tax* (1960).

ADAM KAUFMAN, M.A. Warsaw, M.A. New School for Soc. Res.; NBER since 1953; pubs.: "The Origin of Political Economy of Socialism" (*Sov. Stud.*, Jan. 1953); *Small-Scale Industry in the Soviet Union* (1962).

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ROBERT J. LAMPMAN, B.A., Ph.D. Wisconsin; prof. econ. Wisconsin; NBER since 1957; pubs.: *The Share of Top Wealth-Holders in National Wealth, 1922-56* (1962); *Washington Medical Service Corporations* (with G. A. Shipman and S. F. Miyamoto, 1962).

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ROBERT E. LIPSEY, B.A., M.A., Ph.D. Columbia; lect. econ. Columbia; NBER since 1945; pubs.: *Price and Quantity Trends in the Foreign Trade of the United States* (1963); *Studies in the National Balance Sheet of the United States* (with R. W. Goldsmith, in press).

RUTH P. MACK, A.B. Barnard, Ph.D. Columbia; Institute of Public Administration; NBER since 1941; pubs.: *Flow of Business Funds and Consumer Purchasing Power* (1940); *Consumption and Business Fluctuations* (1956).

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MORRIS MENDELSON, B.A. Queen's, Canada, Ph.D. Cornell; assoc. prof. fin. Pennsylvania; NBER since 1955; pubs.: *The Flow-of-Funds Through the Financial Markets, 1953-1955* (1959); "The Optimum Grossness in Flow-of-Funds Accounts," in *The Flow-of-Funds Approach to Social Accounting* (1962).

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ROGER F. MURRAY, B.A. Yale, M.B.A., Ph.D. N.Y.U.; S. Sloan Colt prof. banking and fin. Grad. Sch. of Bus., Columbia; NBER since 1958; pubs.: *Pensions: Problems and Trends* (contrib., 1955); *Business Loans of American Commercial Banks* (contrib., 1959).

RALPH L. NELSON, B.S. Minnesota, A.M., Ph.D. Columbia; lect. econ. and bus. hist. Columbia; NBER since 1955; pubs.: *Merger Movements in American Industry* (1959); *Concentration in the Manufacturing Industries: A Mid Century Report* (1963).

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