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THE STUBBORN PROBLEM OF INFLATION

It may well be that of all the problems—economic, social, and political—confronting the country today, inflation is the one uppermost in the minds of more Americans more of the time than any other. The rate of inflation indicated by the rise in the consumer price index was almost nine per cent during 1973. Certainly, experience with rising price levels is as widespread, direct, and frequent as the act of family marketing.

Is inflation becoming a way of life?

The past year's rise is especially worrisome because it is the latest, and largest, in a series that has troubled the country for some eight years now. Following a decade and a half of relatively mild increases in the general price level, averaging 1.6 per cent per annum, the annual rate of inflation began to move up after 1964. It reached a peak of 5.9 per cent in 1969–70 (calendar year comparisons), receded to a level of about 3.3 per cent in 1971–72, and then rose again, this time more sharply, to the current high level of which the country is painfully aware. These increases have put today's price level almost fifty per cent above that of 1964.

Countries throughout the world have been unable to prevent inflationary surges. One might ask whether the persistence of inflation reflects inadequacy of fundamental knowledge, or of current information required to apply promptly what knowledge there is. Or is it that the public and its officials are ignorant of what the experts agree upon? Or is it due to deficiencies of governmental organization which inhibit or obstruct the execution of appropriate policy? Or is it, perhaps, that the execution of effective remedies is stifled because there are strong differences of opinion concerning the costs of control compared with the benefits, or about who should bear the costs or reap the benefits? It is evident that a solution to the inflation problem and the closely related problem of full employment must

necessarily come to grips with social and political as well as economic perplexities. Therefore, in the National Bureau's current and future research into the complexities of inflation an attempt will be made to probe not only the economic issues involved, but the social and political ones as well.

NBER staff committee on business cycles

Through the years researchers at the National Bureau have devoted much time and effort to developing the facts and economic relationships involved in economic cycles and stabilization. Most recently, in recognition of the current concern with the problem of identifying a "recession" and the critical role the National Bureau has in the past played in establishing a chronology of recessions, its President, John Meyer, has appointed a committee of National Bureau staff members to advise him on these matters. The committee includes Charlotte Boschan, Solomon Fabricant, Edwin Kuh, Edward K. Smith, Victor Zarnowitz, and Geoffrey H. Moore (Chairman). The group expects to consider the nature and timing of any studies the National Bureau should make that bear on the problem of defining or identifying such phenomena as "recessions" or "growth recessions."

Common stock values and inflation

The Supplement accompanying this issue of the *Report,* "Common Stock Values and Inflation—The Historical Record of Many Countries," was prepared by Phillip Cagan of the National Bureau's Senior Research Staff. It serves as an example of how National Bureau research findings may be applied in reaching decisions appropriate to the current economic situation. More specifically, Cagan examines the appropriateness of the traditional response of many investors who, to protect themselves against losses of purchasing power implicit in changes in the price level, put their funds into common stocks in the belief that the values of these securities will at least keep pace with a rise in the price level. Cagan finds that stocks do pass the test as an inflation hedge only if they are broadly selected and held for long periods of time. In the short run, as many unhappy stockholders already know, stock prices and consumer prices may move in opposite directions. In this connection, John Lintner, a National Bureau Senior Research Associate, has been examining the short run (three to four quarters) effects of inflation on investments in common stock. Lintner's preliminary findings support his hypothesis that over the short run, inflation affects common stock investments adversely and severely. More specifically, Lintner's research results to date indicate that after a period of favorable economic conditions with a low rate of inflation, the onset of an inflationary episode may initially raise common stock prices for a brief period; soon, however, the inflationary impetus becomes neutralized, and shortly thereafter turns negative. The degree and timing of these effects and of the recovery stage depend directly upon the degree of inflation.

In the long run . . .

In the short run . . .

Other applications of some National Bureau research findings are illustrated in the following statement concerning the current economic situation, which was prepared for the *National Bureau Report* by Geoffrey H. Moore, a National Bureau vice president-research.

Measuring the State of the Economy

Geoffrey H. Moore

1. Despite widespread reports to the contrary, the National Bureau of Economic Research has not in the past and does not plan in the future to define a recession in terms of a decline in real GNP for two consecutive quarters. The Bureau's staff examines a wide variety of measures of economic activity, including employment, unemployment, output, income, and sales, and considers how long sustained the decline is, how deep it gets, and how widespread are its effects in comparison with previously recognized recessions. The shortest of the five recessions recognized since 1948 lasted nine months and the longest thirteen. Unemployment rose by two to four percentage points and reached levels of six to 7½ per cent. Real GNP dropped between 1½ and four per cent. Employment declined in 80 to 90 per cent of the major industries. Table 1 contains some of this record back to 1920.

How soon recessions of this magnitude can be recognized after they begin depends essentially on two factors. One is how fast they develop. If a sharp, widespread decline occurs at the outset, accompanied by other evidence that it will persist, a judgment can be made quickly. Otherwise months may elapse before the situation is clarified, and in some instances it may always remain marginal. The second factor is how much risk one wishes to take on being wrong—either recognizing a recession that does not occur, or failing to recognize one that does. Past experience suggests that recessions can be identified and their relative severity appraised with reasonable fidelity a few months after they begin—but experts differ about what is "reasonable" and how few is "few."

2. Business recessions in recent decades, both in the United States and abroad, have become briefer and milder. Secular shifts in the character of economic activity, such as the shift toward greater employment in industries that are relatively recession-proof (service industries, including government); the creation and extension of new institutions such as bank deposit insurance and unemployment insurance; and the attention given by governments to the use of fiscal and monetary policy to modify the business cycle have combined to produce this result. The contraction phase of the cycle is often characterized nowadays by a reduced rate of growth in aggregate economic activity rather than an absolute decline. Hence the term "growth cycle" has come to be applied to these milder fluctuations.

Recent studies by Ilse Mintz of the National Bureau, including a report that has not yet been published, have helped to define and identify growth cycles, but this is only a beginning. Growth cycles have not yet become a firm element in the thinking of economists. Hence we are on less certain ground in attempting to determine where we stand currently in relation to the growth cycle. Nevertheless, it appears that the economy entered a slowdown phase last spring and is still in it. According to Mintz's chronology, it is the ninth such slowdown since 1948. Five of the previous eight ended up as business cycle recessions or contractions (see point 1 above), but there is no conclusive evidence yet (February 1974) that this one will do so. In the other three slowdowns the growth rate of real GNP slowed to

TABLE 1

Selected Measures of Duration, Depth, and Diffusion of Business Cycle Contractions from Peak (upper line) to Trough (lower line) 1920–70

	Jan. 1920 Jul. 1921	May 1923 Jul. 1924	Oct. 1926 Nov. 1927	Aug. 1929 Mar. 1933	May 1937 Jun. 1938	Feb. 1945 Oct. 1945	Nov. 1948 Oct. 1949	Jul. 1953 Aug. 1954	Jul. 1957 Apr. 1958	May 1960 Feb. 1961	Nov. 1969 Nov. 1970
DURATION (months)											
Business cycle chronology	18	14	13	43	13	8	11	13	9	9	12
GNP, current $	n.a.	6	12	42	9	6	12	12	6	6	[c]
GNP, constant $	n.a.	3	3	36	6	n.a.	6	12	6	12	15
Industrial production	14	14	8	36	12	27	15	8	14	13	14
Nonfarm empl.	n.a.	n.a.	n.a.	43	11	22	13	16	14	10	8
DEPTH [a] (per cent)											
GNP, current $	n.a.	− 4.9	− 3.0	−49.6	−16.2	−11.9	− 3.4	− 1.9	− 2.6	− 0.3	[c]
GNP, constant $	n.a.	− 4.1	− 2.0	−32.6	−13.2	n.a.	− 1.9	− 3.4	− 3.9	− 1.6	− 1.5
Industrial production	−32.4	−17.9	− 7.0	−53.4	−32.4	−38.3	− 9.9	−10.0	−14.3	− 7.2	− 8.1
Nonfarm empl.	n.a.	n.a.	n.a.	−31.6	−10.8	−10.1	− 5.2	− 3.4	− 4.3	− 2.2	− 1.6
Unemployment Rate											
Maximum	11.9 [d]	5.5 [d]	4.4 [d]	25.2 [d]	20.0	4.3	7.9	6.1	7.5	7.1	6.1
Increase	+10.3 [d]	+ 2.6 [d]	+ 2.4 [d]	+22.0 [d]	+ 9.0	+ 3.4	+ 4.5	+ 3.6	+ 3.8	+ 2.3	+ 2.7
DIFFUSION (per cent)											
Nonfarm industries, maximum percentage with declining employment [b]	97 Sep. '20	95 Apr. '24	71 Nov. '27	100 Jun. '33	97 Dec. '37	n.a.	90 Feb. '49	87 Mar. '54	88 Sep. '57	82 Aug. '60	83 Jun. '70

Notes:

[a] Percentage change from the peak month or quarter in the series to the trough month or quarter, over the intervals shown above. For the unemployment rate, the maximum figure is the highest for any month during the contraction and the increases are from the lowest month to the highest, in percentage points.

[b] Since 1948, based on changes in employment over six-month spans in 30 nonagricultural industries, centered on the fourth month of the span. Prior to 1948 based on cyclical changes in employment in 41 industries.

[c] No decline.

[d] The maximum figures are annual averages (monthly data not available) for 1921, 1924, 1928; increases, in percentage points, are for 1919–21, 1923–24, and 1926–28.

Source: U.S. Department of Commerce, U.S. Department of Labor, Board of Governors of the Federal Reserve System, National Bureau of Economic Research. For a fuller version of this table, see Solomon Fabricant, "The 'Recession' of 1969–70," in Victor Zarnowitz, ed., *The Business Cycle Today*, NBER, 1972, pp. 100–110.

2½ to 3½ per cent per year (lower in some quarters), but there was virtually no increase in the unemployment rate, and employment kept rising. The consensus of a group of 55 forecasters surveyed by the American Statistical Association and the National Bureau of Economic Research in early December indicated a growth rate pattern during 1974—influenced in part by the energy crisis—that would be worse than the average of the three previous mild slowdowns but better than the average of the five contractions.

Surveyed again in February, the same group (now including 62 forecasters) lowered their forecasts somewhat. The average forecast of this group now shows a decline in real GNP of seven-tenths of one per cent between the fourth quarter of 1973 and the second quarter of 1974, followed by a rise through the first quarter of 1975. This would be a larger dip than in any of the three milder growth recessions of 1951–52, 1962–63, or 1966–67, but smaller than in any of the business cycle contractions recorded in Table 1. Similarly, the forecasted drop in industrial production of three per cent and the forecasted rise of 1½ percentage points in the unemployment rate are smaller than in the previous business cycle contractions.

3. Although a number of "leading indicators"—series that usually begin to fall before a business downturn occurs—leveled off or declined during the past year, the overall decline so far (the latest data for most series are for January or February) has been relatively moderate. Relative, that is, to what has happened during corresponding intervals in previous slowdowns or recessions. This is true even when allowance is made for the effect of rising prices on such leading indicators as new orders or contracts for construction. This does not mean, of course, that declines do not lie ahead. It is important, however, to appraise the facts that are now available in the light of past experience, and to keep reappraising them as more data come in, because one of the purposes of studying such indicators is to enable policy-makers to act upon the early warning signals they provide.

4. It is important when a recession may be brewing to watch the unemployment rate, since it usually starts up early. It has gone up from a low of 4.6 per cent in October to 5.2 per cent in February. But it is also important to watch the level of employment. In October, despite the fact that unemployment was still at a relatively high level, more persons were employed per person in the population (16 years and older) than ever before. The percentage employed, 57.5, has never been exceeded as far back as comparable figures exist. Since October the percentage employed has dropped slightly, to 57.3 in February, but even that is higher than in any month prior to October. The high proportion of people with jobs is an important factor accounting for the current high level of real income per person or per family.

5. The rate of inflation has declined in every business cycle contraction and indeed in every "growth recession" since 1948, though recently this has happened only with a lag. The rate of increase in the Consumer Price Index reached ten per cent per year last August (measured over the pre-

ceding six months) and remained at about that level until January, when it jumped to 11.4 per cent. (The percentage change over the last six months in the seasonally adjusted CPI converted to an annual rate is one of the best ways to measure the rate of inflation. The Bureau of Labor Statistics reports this rate every month.)

Although high capacity utilization levels in the economy, especially in the materials and fuel producing sectors. were reached early in 1973 while demand was still expanding rapidly,[1] the overall pressure of demand against supply has apparently diminished since then, though not in materials or fuel. One of the best indicators of these demand pressures is the index of leading indicators published by the Department of Commerce, especially after the direct effect of price changes of such of its components as are expressed in current dollars has been removed.[2] This index has been virtually flat since last March; by January, the latest available figure, the index had dropped two per cent below its high in July. Declines in this index of about ten to fifteen per cent, which occurred in the growth recession of 1967 and in the business cycle contractions of 1954, 1961, and 1970, were accompanied (with a lag) by declines in the rate of advance of the consumer price index of two to four percentage points.

6. Although total corporate profits have risen sharply since their low in 1970 it is important to note that the rise during 1973 was greatly influenced by the effect of price rises on the value of inventories. Inventory profits are taxed just like ordinary profits but they do not reflect the underlying profitability of operations and cannot be counted upon as a steady source of income. During the year ending with the third quarter of 1973 (the latest available figure) profits before taxes of all nonfinancial corporations rose 33 per cent, tax liabilities rose 36 per cent, and after-tax profits rose 30 per cent. But the Department of Commerce's estimate of the inventory valuation adjustment rose 146 per cent, and with this removed, adjusted profits after taxes rose only five per cent. Meanwhile, corporate output was rising eight per cent; as a result, adjusted after-tax profits per unit of output fell by three per cent. As a matter of fact, the latter have remained at about the same level since 1971, and lower than in any year since 1948 except for 1969 and 1970. The contribution of this factor to the inflationary surge of 1973 was, if anything, negative.

* * *

One of the values of the extensive studies of business fluctuations by the National Bureau is that they have made available an historical record against which current developments can be compared, appraised, and understood. This value is never so apparent as when the economy confronts new recessionary tendencies or new inflationary pressures. Some developments in the months ahead will certainly be unique, but others will fall into a familiar pattern. A well-documented record can help us to draw the distinction and respond appropriately.

[1] See my essay, "How Full is Full Employment?" American Enterprise Institute, July 1973.

[2] The evidence for this is set forth in my paper, "Prices During Growth Cycles," presented January 22, 1974, at a Roundtable on Inflation held by The Conference Board in Canada.

AN OVERVIEW OF SOME CURRENT NBER RESEARCH RELEVANT TO THE PROBLEM OF INFLATION

Moore's piece illustrates how information on the current state of the economy, a necessary condition for effective policy making is far better today than it was ten or twenty, not to mention thirty or forty, years ago. Statistics are more accurate, more comprehensive, more frequent, more promptly reported. Data deficiencies, however, still exist. For example, available price indexes do not fully reflect changes in the quality of the goods and services they cover. List prices, rather than prices actually received, are still used for about twenty-five per cent of the entries in the wholesale price index, although it is now known—through National Bureau studies published in 1966—that the two kinds of data do not always move closely together. Revisions mentioned by Moore are only beginning to be made to allow for changes caused by inflation in the behavior of the composite indexes, which the National Bureau helped to develop and improve over many years and which the Department of Commerce now publishes monthly.

A fresh look at the indicators

Over the years the National Bureau has continued to collect and analyze data in a constant effort to develop ever better methods for interpreting the current economic situation and anticipating the future. Most recently, in connection with a study begun by the Bureau of Economic Analysis of the U.S. Department of Commerce, Victor Zarnowitz and Charlotte Boschan, both members of the National Bureau's Senior Research Staff, undertook another comprehensive evaluation of the system of business cycle indicators, so as to update the record and extend and improve economic statistics generally and the analytical methods applied to them. For example, they will attempt to determine if indicators used for identifying classical business cycles may also be used for identifying the "growth cycles" (described briefly in Moore's report above). The list of indicators in their study includes nearly three hundred time series, only about half of which are now widely used. They will update the scoring system for indicators worked out in the 1967 study by Moore and Julius Shiskin, *Indicators of Business Expansions and Contractions,* and extend it to the new series. The charts, measures, and scores assembled in this investigation may provide the basis for classifying indicators by their timing, evaluating them, and ultimately selecting those appropriate to current and anticipated developments in the economy.

International economic indicators

The Zarnowitz-Boschan study is closely related to a new project undertaken by Moore and Philip A. Klein, who are attempting to develop a set of international economic indicators. The objective is to show how selected lists of monthly and quarterly economic indicators for the major developed countries can be effectively organized to throw light on the current state of the business cycle or growth cycle in the selected countries and around the world. Moore and Klein plan to produce first a graphic and tabular arrangement of the principal leading, coincident, and lagging indicators for each country. Over the next few years, if the project is successful in generating interest and support, a large amount of analytical work will be done for each country to set forth the properties of the data;

their cyclical behavior; their significance, limitations, and comparability; and their international interrelations. The importance of research along these lines is underscored by the profound consequences for international monetary relations, trade, capital flows, inflation, and the balance of payments that appear to result from differences among countries in the state of the business cycle in which they find themselves at any given time.

From demand-pull inflation to stagflation

In another investigation recently undertaken at the National Bureau, John Meyer and Daniel Weinberger found that four cyclical states can be distinguished in the economy of today: recession, a period in which total aggregate activity declines somewhat from previous peaks; recovery, the early expansion out of a recession; classic demand-pull inflation in which "too much money chases too few goods;" and "stagflation," a situation in which capacity utilization drops off under the stress of demand-pull, unemployment may begin to rise, and total monetary expansion diminishes, but prices and wages nevertheless continue to increase. Their preliminary results indicate that 1973 was a year of demand-pull inflation and that evidence for the onset of stagflation is becoming apparent, as Moore also suggests.

Wholesale prices during inflation

A number of the National Bureau's projects on productivity, employment, and price levels should also prove highly relevant to the analysis of inflation. For example, apart from the work which Phillip Cagan is doing with respect to the influence of inflation on long-term common stock investments, which was mentioned earlier, he is also examining the behavior of wholesale prices during periods of inflation. He first investigated the persistence of price increases during the 1955–59 inflation. He is currently analyzing data for the period since 1969, comparing cyclical movements in industrial prices, output, profit margins, and wages for fifteen industries and some fifteen hundred individual commodity prices. Since the response of the economy to demand changes in the latest inflationary period has been slower than in the episode of 1955–59, he is trying to pinpoint the behavioral differences.

Other members of the research staff, Solomon Fabricant, Robert Gordon, Milton Friedman and Anna Schwartz, for example, are also continuing to explore the conditions inherent in inflationary episodes and means of ameliorating them. Economists may have learned a great deal about defining and measuring inflation—at the very least they are clearer as to what their differences are and why. But they have far to go before they can agree on the relative importance of the monetary, fiscal, and other elements involved. In time, studies by economists at the National Bureau and elsewhere will serve to strengthen the tested knowledge built up by economists in the past. The result will be a better foundation for effective policy formulations to deal with stubborn economic problems, of which inflation is only one.

A HISTORY OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH—PART IV

The creation of the National Bureau, its first efforts, and its cooperative approach to economic investigations have been recounted in previous issues of the *National Bureau Report*. In this installment of the National Bureau's history the impact of the major economic upheavals associated with World Wars I and II and the "Great Depression" will be examined, for many of the investigations which were generated by those events serve as the forebears of the Bureau's current research program.

The First World War gave a marked impetus to the search for economic knowledge. Before the war economists served typically as onlookers, not planners or operators of the activities they tried to explain. For the most part, professional economists made their living by teaching. Only a few of the largest businesses employed economists, and few government agencies had economists on their staffs. Academic economists might have regarded themselves as good advisers; but that view was not widely shared by the public, perhaps because economists differed so greatly about what ought to be done in a practical way. They were found on both sides of most questions of the day—the monetary standard, banking organization, taxation, social legislation, trade unions, et cetera. Nevertheless, economists shared one characteristic that was needed by a nation at war—they were trained to think about the economy as a whole.

During World War I economists were pressed into action on an unprecedented scale because the war effort required the mobilization of all resources under government direction. Since established statistical agencies did not have the capacity to cope with the problems of war, new statistical units were hurriedly improvised by the war boards. The economists who flocked to Washington worked intensely, almost passionately, and were prepared to overcome every obstacle. Where they could not get definite data, they did not hesitate to estimate. Needless to say, there was great confusion and waste. No one was able to put promptly before the responsible authorities the required data concerning men and commodities, ships and factories. Not until just before the Armistice was signed had a systematic organization of federal statistics been developed. But the war boards were being rapidly demobilized, and the considerable gains in extending and organizing federal statistics were in jeopardy.

Nevertheless, statistics had gained a new prestige during the war, and this endured. Many economists who had never before worked with observational records learned to do so in their Washington posts, and they were not likely to lose the habit upon returning to their academic jobs. In peace there would be time for fundamental quantitative studies of economic organization, in contrast to the rushed memoranda of war days.

An attempt to develop economics as an objective science of human behavior through the use of mass observations, however, labored under a material handicap. Speculating about what it is to the interest of people to do under imagined conditions can be carried on by a lonely thinker in a library. He requires no staff of assistants and no financial aid beyond a salary. In contrast, the investigator who wants to use observations of actual

events is in the position of an experimental scientist. He must have a laboratory, specialized equipment, and assistants. Lonely thinkers can and do make contributions in this field; but they must confine themselves to problems that require easily accessible data in relatively small amounts. Larger undertakings call for teamwork. And the largest undertakings are often the only ones suitable for investigating such crucial problems as those that concern national income and business cycles.

It was therefore natural that the impetus given by World War I to realistic inquiry into economics should lead to the founding of institutes for economic research, each with its staff of investigators and assistants. The National Bureau was one of several. It was organized at the beginning of 1920, approximately one year after the war ended, by a group of economists including Wesley C. Mitchell, N. I. Stone, Edwin F. Gay, and John R. Commons, among others, most of whom had shared in the wartime mobilization and learned from hard experience how inadequate was their equipment for dealing with the problems that had been put to them. They wanted to increase knowledge of the sort that had been demanded in coping with war mobilization, for they believed that it would be valuable also in peace.

The accomplishments of National Bureau economists during the prosperous '20s, recounted in previous issues of the *National Bureau Report,* helped to lay a foundation of tested knowledge concerning the nation's economic organization and its operations. Unfortunately, however, the boom of the twenties ended with a stock market crash in October 1929, and was followed by the severest depression in the nation's history. The Bureau's finances remained sound until 1931, then collapsed with the rest of the economy. In 1933 salaries were reduced to avert a threatened deficit and to accumulate a reserve fund that could be used to complete part of the work in progress in case the National Bureau came to an early end. However, many members of the staff, especially those who had university appointments, were in a mood to carry on without regard to the level of compensation, and the Bureau's research activity continued almost without interruption. Fortunately, four foundations and a number of businessmen came to the National Bureau's aid, and by 1934 its budget had regained firm ground.

During the depression, the National Bureau's officers and staff felt that they must continue basic research and yet do what they could to assist government officials who were seeking to stabilize a disintegrating economy. When President Hoover's Committee on Recent Economic Changes urged the Bureau to study the feasibility of public works as a device of economic stabilization, the response was immediate, and Leo Wolman's *The Planning and Control of Public Works,* published in 1930, was the result. A sequel to this study, *Public Works in Prosperity and Depression,* by Arthur Gayer, was carried out later at the request of the National Planning Board. The National Bureau also responded to the request of the Committee on Recent Economic Changes to speed publication of the results of its research on business cycles. An early report on the basis of the collection of data and preliminary manuscripts was prepared by John Maurice Clark, and was published under the title *Strategic Factors in Business Cycles* in 1934. In

1930, the National Bureau also decided to use its *Bulletin,* which had served mainly as a house organ, as a medium for prompt publication of its more significant findings. In successive *Bulletins,* Mills, Givens, Kuznets, Fabricant, Mitchell, Thorp, Burns, Epstein, and Wolman sought to clarify the business depression. Moreover, several members of the staff, notably Mitchell and Wolman, accepted for brief periods posts of large responsibility in the federal service.

Meanwhile, the National Bureau's studies of national income deepened. In response to a Senate Resolution, the Department of Commerce invited Simon Kuznets to investigate recent changes in the national income. This study, *National Income, 1929–32,* published in January 1934, laid the foundation for the estimates of gross national product regularly compiled since then by the Department of Commerce.

As a result of Kuznets's investigations and the many others that had been undertaken by the National Bureau since 1920, thinking in terms of the national income had become a habit of government officials by 1940. Thus, by 1941, when the United States entered the Second World War, government administrators were far better equipped than their predecessors had been during World War I with factual information on production, inventories, productivity, prices, consumer expenditures, and consumer debt. Once again, economists were summoned to Washington to assist in the staggering task of mobilizing the country's resources for war. The mobilization for World War II, however, proceeded much more rationally, as did the vital individual parts of the over-all plan dealing with taxation, production controls, price controls, and consumer credit controls.

The war disrupted most activities of civilian life, and the National Bureau was inevitably one of the sufferers. Many of its ablest investigators were drawn into service with war agencies; some of the younger staff and research assistants joined the armed forces; and it was not easy to find satisfactory replacements.

During the war years, Geoffrey Moore, at the request of the War Production Board, turned to the study of the war's effects on the physical volume of production in the United States. Clarence Long prepared a report on wartime labor supply and employment, while Albert Wohlstetter surveyed war experiences with the labor force and production in Great Britain and Germany. Also in response to official requests, Mills, Mitchell, and Fabricant evaluated the accuracy of cost of living indexes, which figured heavily in wage negotiations. The National Bureau pushed to early completion a volume on *Fiscal Planning for Total War,* by W. L. Crum and associates, published in 1942. A series of publications on *Our Economy in War* was initiated, and Occasional Papers replaced the *Bulletin* in December 1940 as a medium of prompt publication. Fourteen Occasional Papers dealing with major aspects of the economy at war were published between 1942 and 1944.

The National Bureau's main effort during the war years continued, however, to be devoted to basic research. Although few new studies were started, the research on production, employment, and productivity was broadened to include the service industries. Also, a study of the tax treatment of capital gains and losses was initiated; plans were laid for a

new series of studies in corporate finance, agricultural finance, and urban real estate finance; and attention was give to research planning in areas that had not counted significantly in the National Bureau's program up to then—especially the flow of money payments, governmental finance, and the international economic relations of the United States.

The economic mobilization of 1941–42 differed from that of 1917–18 in that considerably more thought was given to the difficulties that would attend the return to peace. As Wesley C. Mitchell wrote in the National Bureau's Twenty-second *Annual Report* published in 1942, "That will be the time when we shall need most sorely all the economic wisdom we can muster. For the economic problems of peace are really harder than those of war—harder partly because we do not see them so clearly as matters of national concern."

PROFILES

This series was instituted to acquaint the public more fully with those men and women who serve on the National Bureau's Board of Directors and thereby help determine what course of research the organization will pursue. Only once since the series was begun has someone not serving in the capacity of a director been selected for a profile. That distinction fell upon Simon Kuznets, a long-valued former member of the National Bureau's research staff, who was awarded the Nobel Prize in Economic Science in 1971. Now the occasion again arises to break with tradition, for another esteemed former member of the National Bureau's research staff, Wassily W. Leontief, has been named recipient of the Nobel Prize in Economic Science for 1973.

Wassily W. Leontief

came to the United States in 1931 at the invitation of the National Bureau of Economic Research to assume the position of a National Bureau Research Fellow. He was met at Ellis Island by another former National Bureau Research Fellow, Simon Kuznets.

Born in Leningrad on August 5, 1906, he graduated from that city's university at the age of 15 with the degree of "Learned Economist." In 1925 he and his family fled Russia and three years later, at the age of 22, he completed his doctorate at the University of Berlin. After spending a year as a Research Associate at the Institute for World Economics at the University of Kiel in Germany, he was appointed economic adviser (specializing in railway and transportation policies) to the Chinese government at Nanking. In the same year that he came to the National Bureau he joined the faculty of Harvard University, where he has been professor of economics since 1946 and where he now occupies the Henry Lee Chair.

He organized the Harvard Economic Research Project in 1948 and since then has served as its director. He is also chairman of Harvard's Society of Fellows.

During World II, Leontief was Chief of the Russian Economic Subdivision of the Office of Strategic Services. He has also been a General Consultant to the U.S. Department of Labor, a Consultant to the United Nations Security General's Consultative Group of the Economic and Social Consequences of Disarmament, and he continues to serve as a General Consultant to the U.S. Department of Commerce.

Leontief is known in economic circles as "Mr. Input-Output" in recognition of the method of input-output analysis he developed to illustrate precisely how the economy fits together and works. In awarding the Nobel Prize to Leontief, the Royal Academy of Sciences noted that the method—used in Communist countries as well as in the West—was effective in analyzing sudden changes in an economy. It would, the Academy said, help planners determine the economic effects of, for example, sudden peace, disarmament, or military mobilization. In brief, his input-output system represents the empirical approximation of the interdependencies of all behaving units in the economy as set forth in general equilibrium theory. He has published four books, *The Structure of American Economy, 1919–1939* (1952); *Studies in the Structure of the American Economy* (1953); *Input-Output Economics* (1966); and *Essays in Economics* (1966); and numerous articles in scientific journals and other periodicals in the United States and abroad in which he describes, refines, tests, and demonstrates input-output technique and its multifaceted, universal applications. Leontief has subjected numerous economic theories to input-output analysis to ascertain their validity, and in some instances he has discovered some strange and unexpected realities. One is the so-called Leontief Paradox—his finding that goods imported by the United States embody more capital and less labor on the average than the goods it exports. This result, taken literally, would seem to imply that in this relatively wealthy country, capital is the scarcer resource and labor the more plentiful one. Another of his contributions has been to the development of linear programming—a mathematical technique for solving involved problems of economic operations.

While President of the American Economic Association during 1970, Leontief delivered a keynote address at a dinner held to commemorate the National Bureau's Fiftieth Anniversary. In introducing him on that occasion, Walter W. Heller noted that, ". . . among his many honors and honorary degrees there is one that seems particularly apt: in 1953, the University of Pisa had the good grace to confer upon him the 'Order of the Cherubim.' " Apart from this piquant distinction, honorary doctorates have been conferred upon him by the universities of Brussels, York, Louvain, and Paris (the Sorbonne). He is also an Officer of the French Legion of Honor.

With plans underway for the sixth International Conference on Input-Output Techniques, in Vienna, cosponsored by the United Nations, it appears that input-output analysis has taken its place among the fundamental elements of economics. Leontief and "input-output" are permanent words in the economics vocabulary.

Geoffrey H. Moore

virtually began his career as an economist at the National Bureau with his appointment as a Research Fellow in 1939. While working on the project which earned him the fellowship award, a review of the fluctuations of agricultural output during short periods, it became apparent that his capabilities as a statistician would make him a valuable addition to the staff of the Bureau's business cycle program. Thus, in 1942 he was made a permanent member of the National Bureau's research staff.

Moore's talent as a research administrator as well as a scholar resulted in his 1948 appointment as Associate Director of Research. In 1965 he succeeded Solomon Fabricant as Director of Research, thereupon shouldering responsibility for guiding all phases of the Bureau's program. At this time he was also first elected to the National Bureau's Board as a Director at Large, a position which he continues to hold. He relinquished his position as Director of Research, however, in 1968 to become a Vice President-Research, and a year later accepted a post in Washington as Commission of Labor Statistics.

His initial interest, centering on agricultural economics, can be traced back to his earliest years in Pequannock, New Jersey, where he became keenly involved with farming and farmers' welfare. Before his college days he raised chickens and he worked his way through Rutgers University, where he set out to study poultry husbandry. Shortly after graduation at the bottom of the Depression he worked in feed stores waiting on farmers whose impatience taught him to do fast mental arithmetic. One summer he worked for Cornell University on a statistical assignment—a survey of farmers' markets and their use of motor trucks in New York State. Another time he worked for the Department of Agriculture on a field survey concerning the relocation of New York City's Washington Market. He received his B.S. in Agriculture from Rutgers (Phi Beta Kappa) in 1933 and an M.S. in 1937. In 1947 Harvard University awarded him a Ph.D. in agricultural economics.

Apart from pursuing research at the National Bureau, Moore has taught at Rutgers, New York University, and Columbia University. He is also a Senior Research Fellow at Stanford University's Hoover Institution. In past years he has participated in a number of boards, committees, and similar groups, among them, the U.S. Treasury Consultants Group, 1961–68 and since 1973; the Advisory Committee to the Bureau of the Census, 1960–67; the Advisory Committee on Statistical Policy, Bureau of the Budget, 1963–68; and since 1960, the Social Science Research Council's Committee on Economic Stability. In tribute to his outstanding

contributions to statistics, he was elected President of the American Statistical Association in 1968.

During his term as Commissioner of Labor Statistics (1969–72), he concentrated on making the Bureau's reports relevant, timely, of consistently high quality, and perhaps most important, completely impartial. During his administration the Bureau of Labor Statistics speeded up the release of every major economic series it issues. When he left the BLS in January 1973 to return to the NBER, newspaper columnists and others made public the admiration and respect that he had gained while serving in Washington.

The open door to Geoffrey Moore's office has always served as an invitation for all to consult with him on any research problem or technical difficulty no matter how large or how minute. He epitomizes the National Bureau ideal of cooperative research.

Erwin D. Canham,

Editor in Chief of *The Christian Science Monitor,* was first appointed to the National Bureau's Board as a Director at Large in August 1961. Since that time the National Bureau has profited from his multifaceted talents as one of the nation's leading writers, radio commentators, and public speakers, one of the best-known American editors throughout the world, and a highly respected businessman.

Erwin Canham was born in Auburn, Maine, the son of a part-time farmer and weekly newspaper publisher. With a printers-ink background he attended Bates College and took part in intercollegiate debates, including the first held in the United States with a team from Oxford. He received his B.A. degree from Bates, and in the same year became a reporter for the *Monitor.*

He took a three years' leave of absence as a Rhodes Scholar at Oxford, and received B.A. and M.A. degrees there. Between college terms he was assistant *Monitor* correspondent at League of Nations assembly sessions in Geneva. In 1930 he covered the London Naval Conference, and began service as the *Monitor's* Geneva correspondent; from 1932 to 1939 he was chief of the *Monitor's* Washington bureau. Then he went to Boston as General News Editor. In 1942 he became the *Monitor's* chief editorial executive with the title of Managing Editor. In 1945 he became Editor; and in 1964, Editor in Chief.

Decorated by six foreign governments, Canham has been a first-hand observer at many of the conferences and events which have shaped recent history. (Several years ago rebellious convicts in Boston's old Charlestown Prison asked for him as one of a group to enter a besieged cell block to help end a dangerous revolt.) His wide contacts and experience have led

to his appointment to many international organizations and he has served as an adviser to many leaders in public life. In the spring of 1948, Canham was vice-chairman of the U.S. delegation to the United Nations Conference on Freedom of Information at Geneva, and the following year he was Alternate United States Delegate to the United Nations General Assembly. In 1970 he was appointed a member of the President's Commission on Campus Unrest.

In business life, his accomplishments include serving as President of the Chamber of Commerce of the United States. He was awarded the Business Stateman Award of the Harvard Business School Association of Boston for four consecutive years—1966 through 1969.

Canham holds honorary degrees from twenty-seven colleges and universities. He serves as a director or trustee of numerous industrial, financial, educational, and cultural institutions. From 1945 to 1964 he gave regular weekly broadcast commentaries over the American Broadcasting Company. For a number of years he was moderator of a television program, "Starring the Editors," a Boston newspaper panel appearing Sunday afternoons on WBZ-TV. At present he is commentator on public affairs for the Westinghouse Broadcasting Company—Group W.

Erwin Canham was elected president of the Christian Science Church (a one-year appointment) in 1966, on the eve of the centennial of the Church's founding. His words and deeds reflect his adherence to the philosophy of Mary Baker Eddy, founder of the Christian Science Church, "to injure no man, but to bless all mankind."

Eli Goldston
1920–1974

It is with deep sorrow that the Executive Committee of the Board of Directors of the National Bureau of Economic Research record the untimely death of Eli Goldston on January 21, 1974.

Mr. Goldston was a member of the National Bureau's Board of Directors since 1968. Although his association with the Bureau was regrettably cut short, the subtle and yet incisive influence which he exerted on its program will long be felt. His counsel and advice helped to shape urban and regional investigations and research concerned with social measurement, programs that were relatively new to the Bureau's research agenda six years ago. It was his view that "the effort to quantify clarifies thought," and he believed that the National Bureau should have much to contribute in these areas.

Mr. Goldston, chairman and chief executive officer of Eastern Gas and Fuel Associates, was known as one of the nation's most progressive and articulate business executives, with wide-ranging interests in cultural and civic affairs. He was scheduled to become chairman and chief executive officer of Arthur D. Little on May 1, 1974. A leading proponent of corporate responsibility for social welfare, he wrote in his book, *The Quantification of Concern*, "The best indication I know of the failing or improving health of a marginal corporation is the decrease or increase of its United Way contribution—particularly because it is the modest-sized profit which is most easily nudged up or down by a large percentage."

On another occasion Mr. Goldston wrote, "The price you pay for not trying to participate in the great issues and events of your time is that you die without ever having lived." Members of the Board, officers and members of the National Bureau's staff who were privileged to have known him realize that he not only participated in many of the great issues and events of the time, but helped to shape them. The Executive Committee of the Board of Directors wish to record their deep gratitude for the wise counsel, interest, and practical assistance which Eli Goldston gave to the National Bureau's work and affairs.

INSTITUTIONAL INVESTORS AND CORPORATE STOCK

Raymond W. Goldsmith, editor
Price: $15.00
Published: August 6, 1973

Despite fears that the individual investor has almost vanished from the stock market and been replaced by financial institutions, the authors of this study found that at least as recently as 1968 individuals still owned more than three times as much corporate stock as institutions. The widespread impression that institutions dominate the market arises partly from their having become much more active traders of the stock they hold than they used to be. Thus, they have come to be more important than individuals in trading activity on the New York Stock Exchange.

There can be no doubt about the importance of either corporate stock or financial institutions for the size and character of the financial superstructure of the American economy. In 1968 corporate stock had a total value of $1,000 billion (excluding intercorporate holdings) which represented approximately one-fourth of the value of all financial assets outstanding in the United States. The assets of financial institutions, including personal trust departments, came to approximately $1,600 billion, equal to another two-fifths of the total. Corporate stock, excluding the duplication of about $250 billion involved in the corporate holdings of stock by financial institutions, represented more than one-half of the financial superstructure of the United States.

The questions, however, are to what extent and how the operations of financial institutions on the one hand, and the issuance of and transactions in corporate stock on the other, have contributed to the growth of the American economy in the past 120 years since both of them have acquired substantial importance. The same questions are asked in relation to the postwar period. The direction in which these phenomena influenced the present organization and efficiency of the American economy as well as the distribution of its ownership and control is examined.

This study provides a comprehensive, quantitative basis for appraising the position of the holdings of and transactions in corporate stock by institutional investors. Holdings are viewed in their role as one among the assets of financial institutions and as an element in the liabilities and equity of corporations. These aspects are examined in the framework of a sectorized national balance sheet in which transactions are regarded as a component of flows of corporate shares.

The facts concerning holdings of and trading in corporate stock by the main types of financial institutions are established within an analytical framework, and two sets of ratios are determined. On the basis of these ratios, the authors determine trends that have existed in the institutional holdings of and transactions in corporate stock in relation to the assets of financial institutions and to the volume of corporate stock outstanding or traded. They study how these movements have changed since corporations and financial institutions became important features in the American

economic and financial scene. Finally, they ascertain the immediate economic and institutional determinants leading to these movements.

As background for the discussion of corporate stock ownership the book includes new estimates of the national wealth, national assets, and the national balance sheet of the United States, and of the value of land and of common stock outstanding. There is also a report on the distribution of assets among individuals of different age and wealth. These showed that the national wealth of the United States reached over $3 trillion (or more than $15,000 per person). About 80 per cent of this wealth was privately owned and the other 20 per cent belonged to government agencies.

ORDERS, PRODUCTION, AND INVESTMENT: A CYCLICAL AND STRUCTURAL ANALYSIS

Victor Zarnowitz
Price: $20.00
Published: May 31, 1973

Forecasters and analysts of business conditions have long held that changes in the volume of new orders placed with manufacturers furnish useful clues to changes that will occur in general business activity several months later. In this volume the author, a student of business cycles, substantiates this view with empirical evidence indicating that downturns in new orders precede business peaks by eight months on the average, while upturns precede business troughs by an average of five months.

Typically, early in a business expansion, demand (new orders) exceeds production; unfilled orders accumulate, and delivery periods lengthen. When, subsequently, new orders begin to decline, there will be no immediate effect upon production, which continues to rise to fill backlogs. The backlog continues to increase, although at a slower pace, until new orders fall below the level of shipments. Even then, output may still move up for a short time but cutbacks will inevitably follow. These relationships have persisted for as far back as data are available, but the lags between fluctuations in orders and in the general business cycle were significantly shorter in the decade prior to World War II, and significantly longer in much of the postwar period.

The intervals by which new orders led business activity have been particularly long in several recent boom periods, with large accumulations of unfilled orders as demand pressed capacity. Conversely, as capacity grew and demand declined, the time interval between changes in new orders and in business activity diminished. The author notes that during periods of depressed economic activity one of the earliest signs of impending revival is an upturn in the proportion of industries and firms which experience increases in new orders. This is followed by an upturn in the proportion of industries and firms which increase production. Later, as demand broadens, total new orders turn up, preceding the revival in total industrial production. As business turns down, Zarnowitz says, an analogous sequence of downturns occurs.

The book has four substantive parts. In the first orders are related to

later stages of production—that is, outputs to shipments. The turning points, size, and frequency of fluctuations in new orders are compared with those in production and shipments. It also includes a regression analysis of the lagged relations between shipments and new orders.

The second part is concerned with causes and consequences of changes in unfilled orders and inventories. It contains a survey of the evidence bearing on the behavior and role of order backlogs, and an analysis of the relations among changes in unfilled orders, delivery periods, and in prices. A discussion of the cyclical aspects and major determinants of purchasing for inventory is also included.

The third part of the book is focused on the determinants of investment and the relationship between investment commitments (orders and contracts) and expenditures. In the fourth section, an analysis is offered of the behavior of manufacturers' new and unfilled orders during business cycles, and an attempt is made to relate this behavior to other important cyclical processes.

DETERMINANTS OF EXPENDITURES FOR PHYSICIANS' SERVICES, 1948–1968

A joint publication of the National Center for Health Services Research and Development, U.S. Department of Health, Education, and Welfare, and the National Bureau of Economic Research

Victor R. Fuchs and Marcia J. Kramer
Price: $3.00 (Hard Cover) $1.00 (Paperback)
Published: July 31, 1973

Expenditures for physicians' services in the United States increased by 328 per cent between 1948 and 1969. This growth rate was considerably more rapid than that of the gross national product or personal consumption but about the same as that of other services.

In this volume the authors note that concern over the cost of medical care is widespread. They observe that special attention has been focused on the rapid rise in the price of and expenditures for physician's services because it is said that these services are essential, that the price is not determined in a competitive market, and that consumer ignorance gives the physician unusual control over the quantity and type of service provided.

With respect to physicians' services, Fuchs and Kramer conclude, the imperfections of competition are numerous and powerful. On the supply side, these include entry restrictions created by licensure and professional control of medical education, practice limitations implicit in the hospital appointment system, and the absence of price cutting, advertising, and other forms of rivalry. As for demand, the difficulty that consumers experience in judging the quality of physicians' services is well-known, and it is thought by some that the physician plays a major role in determining the quantity of services provided.

The most striking finding of their study, the authors say, is that supply factors (technology and number of physicians) appear to hold decisive

importance in determining the utilization of and expenditures for physicians' services. This conclusion stands in sharp contrast to the widely held belief that utilization and expenditures are determined by the patient, and that information about income, insurance coverage, and price is sufficient to explain and predict changes in demand.

The data presented show that the shift in the growth rate of physicians' services per capita from −.04 per cent per year in 1948–56 to 3.0 per cent in 1956–66 is more closely related to the changing nature of medical technology and to shifts in the number of physicians than to conventional demand variables. Because physicians can and do determine the demand for their own services to a considerable extent, Fuchs and Kramer assert, people should be wary of plans based on the assumption that the cost of medical care would be reduced by increasing the supply of physicians.

The study throws light on what makes doctors locate in a particular place. They seem to be attracted by higher prices for their services, by medical schools and hospital beds, and by the level of educational, cultural, and recreational opportunities indicated by the average income of the population. The authors did not find any supporting evidence for the theory that encouraging more state residents to enter medical school pays off in terms of more physicians establishing practices in their state of origin. Also, physicians do not show any special preference for states with low-health levels.

THE DETROIT PROTOTYPE OF THE NBER URBAN SIMULATION MODEL

Gregory K. Ingram, John F. Kain, and J. Royce Ginn, with a foreword by John R. Meyer
Price: $12.50
Published: January 25, 1973

Analysts of urban problems have proposed or built many urban simulation models, but only a handful have been the work of economists. As a result, the influence of economic theory is rarely evident in most urban models. The NBER model draws heavily on economic theory and depicts the collective effects that utility-maximizing households and profit-maximizing firms have upon urban housing markets over time.

The Detroit Prototype is the first of a family of computer simulation models of the processes of urban growth that are now being developed at the National Bureau. The NBER Urban Simulation Model is a generalized model based on empirical research for a large number of cities, and it represents aspects of firm, household, and market behavior common to all cities. Although the version of the model described in this volume makes extensive use of data collected in Detroit, the model could be adapted to any American city.

The model is designed to simulate major changes in urban spatial structure occurring over periods ranging from ten to fifty years. It is intended to enable experts to analyze the effects on the geography of urban areas of long-term trends in the level and distribution of employment, of changes

in transportation technology, of increases in income, and of growth in employment and population.

In constructing the model, the principal policy concern is with the direct and relatively long-term impacts that various public policies would have on urban geography, on investments in residential and nonresidential capital, and on changes in the characteristics of neighborhoods. Although the Detroit Prototype is not suitable for the analysis and evaluation of public policies, more highly developed versions of the model should provide valuable insights into the probable effects of a wide variety of proposed public policies. For example, improved versions of the model could be used to evaluate the effects of alternative investments in various modes of transportation on the locational decisions of urban households, on the kinds of housing they consume, and on the density and structure of urban development.

Similarly, improved versions should be useful for evaluating a wide variety of housing programs. Among the most important of these are programs, such as housing allowance plans, that seek to improve the housing conditions of low-income households by increasing their purchasing power.

A variety of other programs—most notably the urban renewal and model cities programs—are concerned less with improving housing standards generally than with improving the quality of particular communities or neighborhoods. The NBER Urban Simulation Model, with its emphasis on the spatial dimensions of the housing market, is ideally suited for evaluating both the direct and indirect consequences of such programs.

The work on the Detroit Prototype raised many questions about its design. These are discussed in the book, along with descriptions of Pittsburgh Models I and II, later stages in the development of the Prototype.

CONFERENCE ON SECULAR INFLATION

Karl Brunner, editor
Price: $3.75
Published: February 1973

This volume contains the reports of the Conference on Secular Inflation sponsored by the Universities-National Bureau of Economic Research Committee. Papers by Jurg Niehans, Anna Schwartz, Carl Christ, the Brunner/Meltzer Research Complex, and Frank Brechling are broadly concerned with causes of secular inflation, while the Nordhaus paper and the Johnson paper each examine the effects of secular inflation. In the last two papers, the authors discuss policy problems: Stein and Infante construct a set of standards for future monetary and fiscal policy, and Perry derives policy guidelines, based on recent U.S. experience, for the present.

This volume appeared as the supplement to the February 1973 issue of the *Journal of Money, Credit and Banking.*

NEW ECONOMIC APPROACHES TO FERTILITY

Theodore W. Schultz, editor
Price: $4.50 (Institutions) $3.50 (Individuals)
Published: March/April 1973

All the papers in this volume, except the first and the closing supplementary note, were presented at a conference jointly sponsored by the National Bureau and the Population Council. This set of studies grew out of research that had been underway for several years and represents a new approach in bringing economic data and theory to bear on fertility behavior. Some subjects covered are education and the derived demand for children, the effect of children on the price of time of the nonworking woman, and an economic perspective on the value of children.

This volume appeared as the supplement to the March/April 1973 issue of the *Journal of Political Economy*.

REPRINTS

The following papers by National Bureau staff members are available from the National Bureau in reprint form. Please address requests to the Publications Department.

Clark, Peter K., "A Subordinated Stochastic Process Model with Finite Variance for Speculative Prices," *Econometrica,* Vol. 41, No. 1, January 1973.

Fisher, Franklin M., "Stability and Competitive Equilibrium in Two Models of Search and Individual Price Adjustment," *Journal of Economic Theory,* Vol. 6, No. 5, October 1973.

Fuchs, Victor R., "Why Health Economics?" *The Mount Sinai Journal of Medicine,* Vol. XL, No. 4, July-August, 1973.

Hoaglin, David C., "An Analysis of the Loop Optimization Scores in Knuth's 'Empirical Study of FORTRAN Programs'," *Software-Practice and Experience,* Vol. 3, 1973.

Hughes, Edward F. X., Eugene M. Lewit, and Elizabeth H. Rand, "Operative Work Loads in One Hospital's General Surgical Residency Program," *New England Journal of Medicine,* September 18, 1973.

MIMEOGRAPHED AND XEROXED PAPERS

The following papers by National Bureau staff members are available upon request from the authors. The National Bureau does *not* have a supply of these studies.

Arora, Swarnjit S., "Error Components Regression Models and their Applications," NBER Working Paper #3, June 1973.

Chiswick, Barry R., "Hospital Utilization: An Analysis of SMSA Differences in Hospital Admission Rates, Occupancy Rates and Bed Rates," NBER Working Paper #2, June 1973.

Dresch, Stephen P., "An Economic Perspective on the Evolution of Graduate Education," September 1973.

———, "The 'Energy Crisis' of 1973–74: On Rationing and the Fiscal Independence of the President," November 19, 1973.

Fair, Ray C., "A Comparison of FIML and Robust Estimates of a Nonlinear Macroeconomic Model," NBER Working Paper #15, October 1973.

Fuchs, Victor R., "Some Economic Aspects of Mortality in Developed Countries," presented at the Conference on Economics of Health and Medical Care, Tokyo, Japan, April 1973.

Ginn, J. Royce, Robert A. Leone, and An-loh Lin, "A Cross-Section Model of Industrial Water Use," November 1973.

———, "Water Use in U.S. Manufacturing," November 1973.

Grossman, Michael, "The Correlation Between Health and Schooling," presented at the NBER Conference on Research in Income and Wealth, November 1973.

Gronau, Reuben, "Wage Comparisons—A Selectivity Bias," NBER Working Paper #13, October 1973.

Hoaglin, David C., "Monte Carlo Techniques in Studying Robust Estimators," NBER Working Paper #16, November 1973.

———, "Review of 'Robust Estimates of Location: Survey and Advances'," Journal of the *American Statistical Association,* forthcoming.

Holland, Paul W., "Monte Carlo for Robust Regression: the Swindle Unmasked," NBER Working Paper #10, September 1973.

———, "Weighted Ridge Regression: Combining Ridge and Robust Regression Methods," NBER Working Paper #11, September 1973.

Lillard, L. A., "From Age-Earnings Profiles to the Distribution of Earnings and Human Wealth," NBER Working Paper #9, September 1973.

———, "Human Capital Life Cycle of Earnings Models: A Specific Solution and Estimation," NBER Working Paper #4, July 1973.

Lipsey, Robert E., and Merle Yahr Weiss, "Multinational Firms and the Factor Intensity of Trade," NBER Working Paper #8, September 1973.

Moore, Geoffrey H., "Productivity, Economic Growth and Inflation: Recent Experience in the Light of Mitchell's Hypothesis," presented at the Conference on an Agenda for Economic Research on Productivity, sponsored by the National Commission on Productivity, March 21, 1973.

Reder, Melvin, "Citizen Rights and the Cost of Law Enforcement," NBER Working Paper #12, October 1973.

Smith, James P., "A Life Cycle Family Model," NBER Working Paper #5, July 1973.

Solmon, Lewis C., "The Definition and Impact of College Quality," NBER Working Paper #7, August 1973.

———, and Paul Wachtel, "The Effects on Income of Type of College Attended," NBER Working Paper #14, October 1973.

Taubman, Paul, "Schooling, Ability, Non Pecuniary Rewards, Socio-economic Background and the Lifetime Distribution of Earnings," NBER Working Paper #17, November 1973.

Welch, Finis, "Education, Information, and Efficiency," NBER Working Paper #1, June 1973.

Zarnowitz, Victor, "A Review of Cyclical Indicators for the United States: Preliminary Results," NBER Working Paper #6, July 1973.

On the following pages are summary financial statements of the National Bureau of Economic Research for years ended June 30, 1973 and 1972, with a report of our certified public accountants. Also presented is a five-year summary of National Bureau operating income and expenditures for fiscal years 1969–1973.

Sustaining and Current Funds

The National Bureau's accounts cover two general types of funds: the sustaining fund and the current fund. The sustaining fund has developed primarily from long-term, capital grants and net capital gains from investment of these funds. Dividend and interest income from investments is utilized as current fund income. From time to time the sustaining fund balance has been reduced by transfers to current funds to help finance research expenditures that could not be met from current income. At the end of fiscal 1973 the sustaining fund balance was $8.7 million, with securities valued at cost, and about $9.3 million, if the securities held were valued at current market prices.

All other funds are included in the current fund which is utilized for the conduct of the National Bureau's program of research, conferences, publications, and related activities. The current fund thus reflects the National Bureau's annual operating revenues and expenditures. Current income is of two general types. Restricted income is derived from grants or contracts for the support of specific research projects in accordance with specific terms, and, hence, restricted income is equal to annual expenditures of restricted funds. Unexpended restricted funds reflect obligations and are not treated as income when grants are awarded or when funds are received in advance of expenditure. Unrestricted funds are available for general program support and are allocable by the Bureau to individual projects as is deemed appropriate by the Board of Directors, and these funds are treated as income when received.

Current Surplus and Prior Deficits

In the fiscal year ending June 30, 1973, the National Bureau's total current income—restricted and unrestricted—was $4,507,350, and expenditures were $4,159,649, leaving a current surplus of $347,701. The scope of National Bureau activities has increased significantly in recent years and the current financial position is encouraging, but it should also be viewed in the light of longer term developments. As is shown in the five-year summary, total expenditures in fiscal 1973 were more than double those of fiscal 1969. While annual total income also increased during the past five years, the National Bureau incurred operating deficits totaling $1,161,574 in fiscal years 1969–71, and these were met by drawing upon the sustaining funds. The current surplus helps somewhat to offset the earlier drain on capital funds.

Expansion of Restricted Income

As is also shown in the five-year summary, the increase in income in recent years has been almost entirely from restricted funds, i.e., from grants or contracts for specific projects in accordance with terms approved by foundations or government agencies. In fiscal 1969, 43 per cent of total current income was derived from restricted funds; in fiscal 1973, about 70 per cent was from restricted sources. The largest single area of expansion has been the establishment, beginning in 1971, of the Computer Research Center for Economics and Management Science, for which $1,269,436 of expenditures in fiscal 1973 were financed by income from a grant of the National Science Foundation.

It is gratifying that restricted fund sources are currently financing a major part of the National Bureau's program. But it must be recognized that restricted grants are typically short term—for one, two, or perhaps three years. For continuity in the maintenance of research staff and the conduct of projects, a continuous effort is required to renew or replace restricted grants. And the results of these efforts are uncertain from year to year.

Need for Unrestricted Income

Unrestricted income has increased from about $1 million in 1969 to about $1.4 million in 1973. This income is derived mainly from foundation grants for general program support, from the contributing subscriptions of business firms and others, and from the investment income of the sustaining fund. The unrestricted income is expended for the development and initiation of research proposals, for cost sharing in the conduct of projects for which restricted funds provide only partial support, and for those costs of publications and dissemination of results which are not covered by restricted grants. Projects approved by the Board of Directors for which restricted grants are not available rely for support entirely on unrestricted income or general funds.[1]

Since fiscal year 1970, the National Bureau has relied heavily upon a seven-year general program support grant from the Ford Foundation for unrestricted current income. This source has provided $400,000 annually in recent years. However, the balance of this grant, $500,000, must now be used for general support over the period through September 30, 1976, and this source can provide annual unrestricted income averaging only $125,000 in each of the next four fiscal years. The National Bureau's budget for the fiscal year ending June 30, 1974, reflects this reduction in unrestricted income, and anticipates total expenditures of $4,785,000, total income of $4,726,000, and a current operating deficit of $59,000.

[1] Detailed schedules related to the following summary financial statements provide information on the extent to which each project was financed during fiscal 1973 from restricted funds and from unrestricted funds and also provide detail on securities held in the sustaining fund. These schedules are available from the National Bureau upon request.

Matching Grant for Additional Funds

Unrestricted funds are essential for the effective conduct of the National Bureau's program. Accordingly, the Board of Directors is seeking to increase income from contributions and subscriptions, which may be appropriated as they see fit to sustain the program in the face of rising costs for research and publication. A Development Committee, with Mr. Robert V. Roosa as Chairman and Mr. J. Wilson Newman as Vice Chairman, is endeavoring to have business and other contributors to the Bureau increase the level of their support. The Alfred P. Sloan Foundation has made available a matching, incentive grant that will be payable to the Bureau to the extent that contributing subscriptions from business firms and others are increased by June 30, 1974, above the levels achieved in past years. Thus increases in contributing subscriptions in fiscal year 1974 will be doubly helpful in supporting the National Bureau's work, since they will be matched by the Sloan Foundation.

John R. Meyer

National Bureau of Economic Research, Inc.

Five-Year Summary of Operating Income and Expenditures
(thousands of dollars)

	1969	1970	1971	1972	1973
Income					
Restricted Funds	$ 778	$ 942	$1,106	$2,302	$3,123
Unrestricted Income	1,035	1,238	1,351	1,245	1,385
Total	1,813	2,180	2,457	3,547	4,508
Expenditures					
Restricted Funds	778	942	1,106	2,302	3,123
Unrestricted Funds	1,293	1,824	1,669	1,217	1,037
Total	2,071	2,766	2,775	3,519	4,160
Excess (Deficiency) of Income over Expenditures	(258)	(586)	(318)	28	348

Source: Annual Financial Statements with Reports of Certified Public Accountants.

FINANCIAL STATEMENTS OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.
Years Ended June 30, 1973 and 1972

Report of Independent Certified Public Accountants

The Board of Directors
National Bureau of Economic Research, Inc.

We have examined the statement of assets, liabilities and funds of National Bureau of Economic Research, Inc. as of June 30, 1973 and 1972 and the related statements of revenues and expenditures and changes in fund balances and of functional expenditures for the years then ended. Our examinations were made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements identified above present fairly the financial position of National Bureau of Economic Research, Inc. at June 30, 1973 and 1972 and the results of its operations for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Hurdman and Cranstoun
Certified Public Accountants

New York, New York
November 2, 1973

EXHIBIT "A"

Statement of Assets, Liabilities and Funds
June 30, 1973 and 1972

Assets	1973	1972
Current fund:		
Cash	$ 10,235	$ 47,796
Time deposits	356,874	248,680
Certificate of deposit	100,000	
Grant and contract pledges (Note 1)	3,708,390	3,127,297
Less grant and contract pledges due in subsequent years	3,034,045	2,810,933
Total matured and receivable	674,345	316,364
Advances to sustaining fund	41,778	
Accrued interest and other receivables	85,054	76,117
Prepaid expenses	2,004	8,601
Furniture, equipment, and leasehold improvements (Notes 1 and 2):		
Furniture and equipment	56,166	25,256
Capitalized equipment lease	34,033	34,033
Leasehold improvements	16,393	16,393
Less accumulated depreciation and amortization	(19,367)	(6,218)
	87,225	69,464
Total current fund	1,357,515	767,022
Sustaining fund (Note 3):		
Cash	29,192	24,578
Marketable securities (quoted market value: 1973, $9,320,699; 1972, $10,368,754) (Note 1)	8,700,522	8,456,368
Total sustaining fund	8,729,714	8,480,946
	$10,087,229	$9,247,968

Liabilities and Funds	1973	1972
Current fund:		
Liabilities:		
Accounts payable and accrued expenses (Notes 1 and 2)	$ 391,573	$ 160,343
Capitalized lease obligations (Note 2)	28,879	
	420,452	160,343
Fund balances (per accompanying statement):		
Restricted (advance payments received for restricted research projects) (Note 1)	383,301	400,618
Unrestricted	553,762	206,061
	937,063	606,679
Total current fund	1,357,515	767,022
Sustaining fund (Note 3):		
Liabilities:		
Due to brokers		151,901
Advances from current fund	41,778	
Fund balance (per accompanying statement)	8,687,936	8,329,045
Total sustaining fund	8,729,714	8,480,946
	$10,087,229	$9,247,968

The accompanying notes are an integral part of the financial statements.

EXHIBIT "B"

Statement of Revenues and Expenditures and Changes in Fund Balances
Years Ended June 30, 1973 and 1972

	1973			1972		
	Current Fund		Sustaining Fund	Current Fund		Sustaining Fund
	Restricted	Unrestricted		Restricted	Unrestricted	
Revenues:						
Grants (Note 1)	$3,122,610	$ 450,000		$2,302,349	$ 450,000	$ 250,000
Contributions and subscriptions		423,340			366,235	
Interest and dividends		402,533			336,594	
Royalty income and sales of publications and other services		101,730			89,868	
Gain (loss) on sales of marketable securities			$ 358,891		1,222	(120,600)
Miscellaneous		7,137			515	
Total revenues	3,122,610	1,384,740	358,891	2,302,349	1,244,434	129,400
Expenditures (per accompanying statement):						
Research programs (Note 1)	3,122,610	888,018		2,302,349	1,100,634	
Fund raising		80,841			49,389	
Distribution of publications		28,141			36,491	
General publicity		40,039			30,086	
General and administrative		1,019,529			834,041	
Applied to projects (Note 1)		(1,019,529)			(834,041)	
Total expenditures	3,122,610	1,037,039		2,302,349	1,216,600	
Excess of revenues over expenditures	—	347,701	358,891	—	27,834	129,400
Net decrease in advance payments received for restricted research projects (Note 1)	(17,317)			(14,598)		
Transfers from sustaining fund					12,908	(12,908)
Net change for year	(17,317)	347,701	358,891	(14,598)	40,742	116,492
Fund balances, beginning of year	400,618	206,061	8,329,045	415,216	165,319	8,212,553
Fund balances, end of year	$ 383,301	$ 553,762	$8,687,936	$ 400,618	$ 206,061	$8,329,045

The accompanying notes are an integral part of the financial statements.

EXHIBIT "C"

Statement of Functional Expenditures
Years Ended June 30, 1973 and 1972

	1973					1972				
	Service Departments	General and Administrative	Fund Raising, Distribution of Publications, and Publicity	Research Programs	Total	Service Departments	General and Administrative	Fund Raising, Distribution of Publications, and Publicity	Research Programs	Total
Salaries	$208,210	$ 493,530	$ 48,319	$1,692,354	$2,442,413	$216,731	$361,178	$ 30,293	$1,355,518	$1,963,720
Fringe benefits	26,518	85,442	7,037	185,672	304,669	28,266	68,099	3,828	129,787	229,980
Mailing and shipping	3,199	612	6,124	5,007	14,942	336	812		1,489	2,637
Outside services	1,290	68,998	27,772	108,957	207,017	1,833	42,575	8,179	73,519	126,106
Book manufacturing		16,001	10,985	155,287	182,273	(113)	23,154	11,027	203,583	237,651
Occupancy costs	16,690	125,008	3,106	51,656	196,460	43,902	86,752	4,698	131,467	266,819
Furniture and office equipment rental, maintenance, and repairs	32,851	23,520	881	49,180	106,432	91,746	14,450	1,323	9,202	116,721
Books and supplies	2,575	13,781	1,763	906	19,025	4,565	12,405	1,815	11,324	30,109
Travel	516	28,337	2,737	121,170	152,760	124	21,741	1,395	136,055	159,315
Telephone, postage, and messenger	12,374	47,240	2,554	56,919	119,087	21,451	12,671	2,612	43,676	80,410
Outside computer services	8,082	7,538	4,008	398,525	418,153	(5,505)	24,570	761	239,815	259,641
Miscellaneous expenditures	349	(14,063)	54	10,078	(3,582)	15	22,545	285	3,721	26,566
Bureau grants									19,274	19,274
	312,654	895,944	115,340	2,835,711	4,159,649	403,351	690,952	66,216	2,358,430	3,518,949
Interdepartmental allocations:										
General and administrative	(41,240)	41,240			—	(45,317)	45,317			—
Fund raising, distribution of publications, and publicity	(6,003)		6,003		—	(20,377)		20,377		—
Research programs	(183,066)			183,066	—	(239,885)			239,885	—
	82,345	937,184	121,343	3,018,777	4,159,649	97,772	736,269	86,593	2,598,315	3,518,949
Transfer of remaining service departments' cost to general and administrative costs	(82,345)	82,345			—	(97,772)	97,772			—
	$ -0-	1,019,529	121,343	3,018,777	4,159,649	$ -0-	834,041	86,593	2,598,315	3,518,949
Allocation of general and administrative costs per overhead charged on direct costs		(1,019,529)	27,678	991,851	—		(834,041)	29,373	804,668	—
Total		$ -0-	$149,021	$4,010,628	$4,159,649		$ -0-	$115,966	$3,402,983	$3,518,949

The accompanying notes are an integral part of the financial statements.

NOTES TO FINANCIAL STATEMENTS
June 30, 1973 and 1972

1. Accounting policies

Grants and contracts

National Bureau of Economic Research, Inc. undertakes specific research projects funded by United States Government agencies and certain private organizations under restricted grants and contracts providing for reimbursement of specific expenditures. Funds advanced in excess of such expenditures are returnable to the grantor.

Revenues from restricted grants and contracts are recognized to the extent that amounts reimbursable under the terms of the grants or contracts are expended. Amounts received in excess of sums spent are recorded as restricted fund balances until such funds are expended. Reimbursable amounts generally include corporate general and administrative expenditures applied to projects based on stipulated rates; for certain projects, provisional rates are used which are subject to review. General and administrative expenditures not applicable to reimbursable projects are allocated to all other Bureau projects based on direct expenditures charged to such activities.

The Bureau also receives unrestricted grants which are recognized in current revenues as fixed payments become due in accordance with grant terms.

During fiscal 1970, the Bureau was awarded a $2,000,000 grant for general program support over the ensuing seven-year period. In accordance with the terms of the grant, however, payments of $400,000 per year are being made over a five-year period; accordingly, $400,000 is included in unrestricted grant income in each of the years ended June 30, 1973 and 1972. As at June 30, 1973, $1,500,000 has been received from this grant.

In 1973, the Bureau adopted a policy of recording vacation and sick leave benefits as earned, rather than recording them as the payments were made to employees. Accordingly, a reserve of approximately $134,000 is included in accounts payable and accrued expenses at June 30, 1973; however, the change did not have a material effect on the financial statements for the year ended June 30, 1973.

Furniture, equipment, and leasehold improvements

Furniture and equipment are stated at cost and depreciated using the straight-line method over the following estimated useful lives:

Furniture	10 years
Equipment	5 years
Capitalized equipment lease	5 years

The cost of improvements to leased facilities are being amortized on a straight-line basis over the lives of the appropriate leases. Depreciation and amortization amounted to $13,149 and $2,939 in 1973 and 1972, respectively. The increase is primarily attributed to the computer equipment, discussed in Note 2, which was not installed until 1973.

Marketable securities

Marketable securities are stated at cost.

2. Capitalized lease obligation

During 1973, the Bureau decided to finance computer equipment contracted for in 1972 by entering into a financing lease agreement. The lease agreement requires annual payments, including interest, of $8,072 through 1978 when a final payment of $2,242 is due. As at June 30, 1972, the liability for the equipment was included in accounts payable and accrued expenses.

3. Sustaining fund

The sustaining fund balance consists primarily of the original amounts of five grants from foundations, plus accumulated net gains from sales of investments, reduced by amounts

transferred to the current fund, as authorized by the Executive Committee, to partially finance research expenditures. There are no donor-imposed restrictions on the use of principal or income from any of these grants.

4. Commitments

The Bureau occupies office space under various leases as follows:

	No. of Leases	Expiration Date	Minimum Annual Rental	Total Rental Expenditures	
				1973	1972
New York office	3	1974	$120,000	$113,000	$160,000
Cambridge office	2	1974	90,000	73,000	48,000
New Haven office	1	1979	10,000	10,000	10,000
			$220,000	$196,000	$218,000

Both Cambridge leases provide the Bureau with renewal options. One of the leases provides for an extension of four additional one-year terms at rentals to be established by the lessor. The other lease may be renewed for two additional one-year periods at current rental rates.

In addition, the Bureau is obligated under a lease executed in connection with the establishment of a West Coast branch. The term of the lease commences when construction of office space is completed and continues for 20 years, with options to extend the lease two additional 10-year terms. The annual rental requirement is 7½% of the financed cost of construction, which cannot exceed $200,000 without prior approval of the Bureau, plus real estate taxes and insurance. The Bureau, however, has the option to pay the lessor all or any portion of the financed amount, thereby reducing the annual rental requirement. Although the lease is cancellable by the Bureau, modified rental payments would be required for the remaining term of the lease if the lease cannot be assigned or the premises sublet.

5. Taxes

The Bureau qualifies under Section 501(c)(3) of the Internal Revenue Code of 1954 as a publicly supported organization that is exempt from Federal income tax.

NATIONAL BUREAU REPORT

National Bureau Report is exempted from the rules governing submission of manuscripts to, and critical review by, the Board of Directors of the National Bureau. Each issue, however, is reviewed and accepted for publication by the Research Committee of the Bureau and a standing committee of the Board.

National Bureau of Economic Research is a private, nonprofit, organization founded in 1920 as a center for independent and imparital economic research. In the belief that such research can contribute significantly to the sound treatment of economic problems, it has sought to conduct its activities under conditions that safeguard the scientific nature of the findings and that help make them authoritative and acceptable to persons of different interests and opinions. The National Bureau is supported in part by grants from philanthropic foundations and business associations for particular studies, in part by investment income on capital-sum grants, and in part by unrestricted contributions and subscriptions from companies, banks, labor organizations, foundations, and individuals.

Further information regarding contributions and subscriptions may be obtained from the office of the Vice President–Executive Secretary.

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