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Editorial Message

Spring has barely turned into summer and here is your second issue of the *Reporter* already — keeping you abreast of current NBER doings, as promised. These range over an unusually broad spectrum this time: from changes in the National Bureau's top-level administration to important research activities, from a call for moral leadership by business to a description of NBER's data bank services.

On the research front, your new *Reporter* brings you some real "scoops." There is Geoffrey Moore's innovative inflation chronology, which lets you know where we stand in the inflation cycle. On top of that, our brand new composite leading indexes, part of the Bureau's international economic indicator project, will help you pinpoint business cycle developments all over the globe. Another NBER research area of interest to the business community that is highlighted in this issue deals with studies in the organization of markets.

Altogether, this summer issue of the *Reporter* covers a wide variety of topics and strives mightily in pursuit of its aim: to make the results of basic research as relevant and as currently available as possible. Continued reader comment in this direction is cordially invited.

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NBER Personalities

Top-Level Changes at the National Bureau

The National Bureau of Economic Research has a new president and a new board chairman. At a meeting in Palto Alto, California, on April 22 the Board of Directors announced the appointment of Martin S. Feldstein, Professor of Economics at Harvard University, to the presidency and of James J. O'Leary, Vice Chairman of the Board of the U.S. Trust Company of New York, to the chairmanship, effective immediately. Dr. Feldstein, who remains at his teaching post, succeeds John R. Meyer, also a Professor at Harvard, and Dr. O'Leary replaces J. Wilson Newman, retired Chairman and Chief Executive Officer of Dun & Bradstreet, Inc. and current Chairman of its Finance Committee (see *Business Leadership — Who Is Minding the Store?* below).

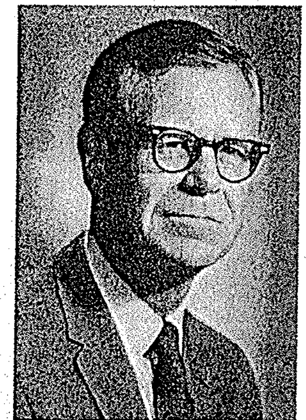
The new president's selection is the fruit of nearly a year's intensive search by the National Bureau's Board in line with the outgoing president's publicly expressed wish to be relieved of his duties prior to his tenth anniversary as president. "An organization dedicated to basic research, as the Bureau is, constantly needs new ideas, new departures and innovations to properly fulfill its role," observed Dr. Meyer as he stepped down from the presidency he had taken over in 1967 from Arthur F. Burns, now Chairman of the Federal Reserve Board.

Dr. Meyer's own innovations during his term of office include the expanded use of modern econometric and computer techniques in the Bureau's work, as well as a wider scope of research to encompass problems of social and economic measurement, the evaluation of nonmarket activities, and the study of energy use and environmental problems. Thus, over the ten years of Dr. Meyer's leadership the National Bureau's research activity grew from a \$1.5 million to a nearly \$6.0 million budget, and, formerly concentrated only in the New York office, is now conducted in Washington, D.C., Cambridge, Massachusetts, and Palo Alto, California, as well.

Martin Feldstein's broad background and experience make him eminently qualified to direct the extensive and varied program of research at the National Bureau. A native New Yorker, he received his bachelor's degree from Harvard College (summa cum laude) in 1961 and went on to England as a Fulbright scholar. At Oxford he became a Nuffield Fellow and Lecturer in Public Finance (1965 to 1967) and received his Ph.D. in 1967. In the same year he joined the Economics Department of Harvard, where he became Professor of Economics in 1969.

Dr. Feldstein's advisory work has included studies for the U.S. Treasury, the Council of Wage and Price Stability, and the Department of Health, Education, and Welfare. This past year Dr. Feldstein has been Senior Research Associate at the National Bureau, and has served as Senior Advisor on the Brookings Panel on Economic Activity since 1975. A Fellow of the Econometric Society, he is currently a member of its council, as well as of the National Academy of Sciences' Institute of Medicine. His published works — far too long a list to be included here — have focused on unemployment taxation, social security, investment behavior, and the economics of health. He currently serves on the editorial boards of the *American Economic Review*, the *Journal of Public Economics*, the *Quarterly Journal of Economics*, and the *Review of Economics and Statistics*.

NBER's new president is married to the former Kathleen Foley. They have two children, Margaret and Janet, and reside in Belmont, Massachusetts.



Dr. James J. O'Leary, the National Bureau's new Chairman of the Board, joined the United States Trust Company of New York in 1969 as Executive Vice President and Economist. Prior to a two-year stint as Chairman and Chief Economist of Lionel D. Edie & Company, he headed the economic research activities of the Life Insurance Association of America (now the American Council of Life Insurance) for twenty years. Earlier in his career he taught economics at Wesleyan University and Duke University.

Vice Chairman of the Board of the United States Trust Company of New York, Dr. O'Leary is Chairman of the company's Economic Outlook Seminar and Money Policy Committee, and serves as a member of the Office of the President of the Trust Company. He also serves on the board of numerous other companies and organizations and is past president of the American Finance Association and past chairman of the Conference of Business Economists.

On a more personal note, NBER's new Board Chairman is married to the former Rita Marie Phelps of Hartford, Connecticut. Dr. and Mrs. O'Leary have four children, and reside in Westport, Connecticut.

Business Leadership — Who Is Minding the Store?

The following excerpts are part of a recent address to the Institute of Internal Auditors by the outgoing Chairman of NBER's Board, J. Wilson Newman. Mr. Newman is retired Chairman of the Board of Dun & Bradstreet, presently Chairman of its Finance Committee, and also serves as Chairman of the Special Review Committee of the Lockheed Aircraft Corporation.

The time is here, the time is now, for business management to reexamine its role and responsibility in the stewardship of the free enterprise system; nothing less than that is at stake. For in our society today, institutions invested with the great opportunities and responsibilities of our large corporations will not be allowed to drift. If they do not exercise their leadership role, if a void develops by default of business in meeting the demands of society, that void will be filled by others, under whose leadership the private sector could end up like a bull with a ring in his nose, led by the edicts of government.

Underlying this note of warning is my growing impression that our society may indeed have reached a significant turning point. The so-called "post-Watergate era," contrary to some people's view, may not be a passing fancy. Instead, we may actually have become a society where the democratic form of government, through full utilization of the public media, particularly television, is far more responsive to the public will than anyone could have imagined in the past. Nor is this development merely a domestic short-term phenomenon. One need only read the election returns in England, Italy, Spain, India, Portugal, and other countries for proof.

And what do we know about the public will? It has become fashionable in our time to take polls and make surveys of virtually everything in order to learn what we think. While the proliferation of these surveys has led some critics to dismiss them as meaningless, many thoughtful people are becoming increasingly concerned about their findings, for they seem to reflect broad areas of dissatisfaction and a low level of esteem and credibility accorded to politicians and business executives.

The fact is that there appears to be a growing craving to find a better way. The recent Presidential campaign in this country, which was predicated on a strategy of values rather than issues, best exemplifies this trend. Make no mistake about it: the undercurrent for a return to spiritual or traditional values is running strong despite the appearances of our more swinging social customs.

Let us next turn to the values of the marketplace. On the international scene, we see larger and larger disparities in economic health between the developed and the less developed countries of the world. The pouring of oil on these troubled waters has not been helpful, to say the least, and dislocation in the economies of many countries has brought about ominous political rumblings. In our own U.S. economy, where our people are better off than anywhere else in the world, society is racked with dissension and dissatisfaction.

Take, for example, our enormous expenditures on research and development, which have created a wide range of consumer products with the highest standards in the world. Our marketing techniques, too, are recognized as having attained levels of excellence never before equalled. Nevertheless, we have unattended areas of public dissatisfaction with products and services to which there has been no timely and adequate response from business. The default on the part of business in anticipating and attending to consumer needs has given rise to a consumerism movement whose mushrooming expansion is creating ills, along with benefits, that will long be with us.

This economic arrogance has served as an open invitation for a further incursion of government regulation into business operation. At the risk of sounding repetitious, I want to reemphasize that nature abhors a vacuum. Those unattended areas of public dissatisfaction will be filled one way or another — and the tendency to remedy shortfalls in the private sector by government edict is already growing apace.

These are some of the trends that have made a reappraisal of the role of business management imperative. A number of questions present themselves that do not yield easy answers. Have the very size and complexity of the large domestic and multinational corporations caused historical concepts and relationships to become obsolete? Should a reexamination of the whole subject in the light of today's sociopolitical picture start with the audit manual or a realistic evaluation of the public conscience and of public expectations?

Is too much effort spent on substituting legislation for conscience and value judgment? Aren't we placing undue emphasis on skillful compliance with the law in its narrowest sense while ignoring its true intent? We are constantly creating all kinds of new laws, regulations, committees, boards, task forces and the like. And no wonder: the media have been replete with information about tax problems, security problems, accounting problems, illegal contributions, subversion, and even out-and-out embezzlement and fraud.

Within this framework it is begging the question to ask whether the role of the internal auditor should be one of verifying petty cash accounts or that of monitoring operating procedures to implement the corporation's policy performance and procedural effectiveness. In fact, we may find that one of the most significant current developments in the corporate picture may be the emergence of the internal audit operation as a crucial influence in this direction — and even in corporate planning and policy matters.

It seems clear to me that the role of the internal auditor, by whatever name, must be expanded very considerably. The reporting relationship must be changed in such a way as to open direct lines of communication from the internal auditor to the highest level of management, to the Board of Directors, and possibly even to the stockholders.

This should go a long way toward restoring public confidence, a badly needed commodity. Publicity about abuses has poisoned the pool of public confidence in the free enterprise system. This form of pollution is as poisonous as any in the environment.

The business community in general, and large corporations in particular, are faced with a challenge that cannot be evaded — it must be met head on. A responsible accounting must be given of the stewardship of the funds invested by the public, as well as of the degree to which the products and services of private enterprise achieve their intended purpose in the marketplace.

I am a staunch advocate of the free enterprise system and a staunch advocate of the business institutional structure as we know it today. At the same time, I see these institutions under attack. It seems to me that some hard questions need to be asked. If we in business do not learn what the questions are, we shall never be able to find the answers.

In Memoriam
H. Irving Forman
1904-1976

It is nearly a year ago that the Bureau mourned the sudden death of one of its oldest friends — Hemen Irving Forman, known better to everyone on the staff as Hi. At the end of 1974 the Executive Committee had unanimously adopted a resolution expressing NBER's esteem for him on the occasion of his retirement. It read as follows:

> RESOLVED,
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> That the Executive Committee, with great appreciation, notes and records the long and expert service to the National Bureau of Economic Research of H. Irving Forman. Mr. Forman joined the Bureau's staff as a chartist in October, 1929, and is now retiring on December 31, 1974. Nearly all Bureau reports published over the course of 45 years have had the benefit of his skills in graphic arts. His assistance in converting statistics to accurate and readily comprehensible charts has been gratefully acknowledged by virtually all Bureau researchers and authors over the years. He reached the Bureau's regular retirement age in 1969, but for five more years he has served with undiminished vigor as his time of retirement was extended by the Executive Committee.
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> Now that he is retiring at the end of 1974, we express thanks to him, on behalf of all his associates, for his many contributions to the work and publications of the National Bureau, and we wish him well in future more leisurely years.

In fact, Hi Forman did not really retire but continued to add to his notable contributions in the graphic presentation of economic data. After his formal retirement he appeared in his drafting room as dependably as ever, although with less frequency, until prevented by illness and, finally, death.

Originally from London, England, Hi had come to this country with his family as a very young child. He grew up in Rochester, N.Y., where he attended school, showing an early flair for math, in which he later received a bachelor's degree from the University of Rochester. He came to New York City during the depression years, determined to forge a career in the field of economics. This found its expression in his dedication to his work at the Bureau, which encompassed forty-seven years, almost the same time span as that of his marriage. The Formans made their home in Brooklyn and had one daughter. Hi was an amateur photographer and avid baseball fan, and, in his later years, an enthusiastic grandfather. It is with deep regret that his Bureau friends and associates note his absence.

An Inflation Chronology

Geoffrey H. Moore

One of the most widely used products of the National Bureau's research on business cycles has been the chronology of business cycle peaks and troughs, which covers 28 cyclical swings in the U.S. economy between 1854 and 1975. Since it pinpoints the dates when recessions begin and end, it is a useful tool for analyzing the behavior of economic data during recessions and recoveries.

An inflation chronology can serve much the same purpose. By pinpointing the dates when waves of inflation have reached their crests and their troughs, it can be helpful to those who wish to analyze factors relating to inflation. Just as in the case of the business cycle, it is useful to know where we stand in the inflation cycle and to recognize a turning point as soon as possible. Nevertheless, despite the fact that we are all, perforce, students of inflation, and despite the fact that a chronology of inflation has been in existence for some years, its use has been confined, so far as I know, to a single person — the author. In an attempt to increase its Nielsen rating even slightly, I have brought the chronology up to date and present it herewith (Table 1).

The inflation chronology is based upon the rate of change in the consumer price index, measured over a six-month interval and adjusted to eliminate the regular seasonal fluctuations in many prices. The peaks are the central months of the six-month interval when the rate of increase in the CPI reached its highest point and began to recede. The troughs are the central months of the six-month interval when the rate reached its lowest point and began to rise. Sometimes the trough rates are negative — the price level declined — but this happened only in the first four cycles, 1948-1958. After that the trough rates were positive. Indeed, there has been an almost unbroken rise since 1948 in the level of the trough rates, from a negative 4.2 percent in November 1948 to a positive 4.7 percent in April 1976. This, of course, is symptomatic of the long upswing in the rate of inflation. It is noteworthy, however, that the trend doesn't show up as clearly in the peaks, which start out at a two-digit level (around 14 percent) and end up at a two-digit level (around 12 percent).

What the table shows, then, is that there were seven upswings in the rate of inflation between 1948 and 1974 and eight downswings. If the last date in the table is correct — a trough in April 1976 — we are now in the eighth upswing. The downswings lasted a year and a half on the average, with a range of one to two years (col. 7). The upswings were longer and more variable, ranging from less than a year to nearly five, and averaging more than two years (col. 8).

Note, too, that the upswings in the rate of inflation were rather small between 1952 and 1966. The smallest rise in this period of relative stability was about 2½ percentage points, the largest was nearly 6 percentage points. The Korean War kicked off the largest rise during the entire period, 18 points; the second largest, 15 points, occurred during 1971-1974. The latest downswing, an 8 point drop from July 1974 to April 1976, was substantial but was surpassed in 1947-1948 and 1950-1952.

One of the most important matters to establish is the relation between this inflation chronology and the business cycle. Table 2 matches the two chronologies. The match is not perfect: in two instances the inflation rate declined but not the business cycle: once in 1950-1952, and then in 1966-1967, but both times there was a slowdown in economic growth.[1] For every business cycle downturn that did occur, however, there is a matching downturn in the inflation rate. For every business cycle upturn, there is a matching upturn in the inflation rate. In other words, every recession was accompanied, sooner or later, by a decline in the rate of inflation. Conversely, every expansion in business activity was accompanied, sooner or later, by a rise in the rate of inflation.

Note: The author is Director of Business Cycle Research, National Bureau of Economic Research, and Senior Research Fellow, Hoover Institution, Stanford University.

[1]These slowdowns, as well as an additional one in 1962-1964, have been identified in a "growth cycle" chronology developed by the National Bureau. See Ilse Mintz, "Dating United States Growth Cycles," *Explorations in Economic Research*, Vol. 1, No. 1, Summer 1974, pp. 1-113. This chronology has been revised and brought up to date in "The Recession and Recovery of 1973-76," Victor Zarnowitz and Geoffrey H. Moore, NBER, forthcoming.

Table 1
A Chronology of Peaks and Troughs in the Rate of Inflation

Date of: Peak (1)	Date of: Trough (2)	Peak Rate (%) (3)	Trough Rate (%) (4)	Percentage Point Change: Down-Swing (5)	Percentage Point Change: Up-Swing (6)	Length of: Down-swing (mos.) (7)	Length of: Up-swing (mos.) (8)
October 1947		13.5					
	November 1948		-4.2	-17.7		13	
November 1950		14.0			18.2		24
	November 1952		-0.6	-14.6		24	
July 1953		2.1			2.7		8
	September 1954[a]		-1.4	- 3.5		14	
July 1956		4.3			5.7		22
	July 1958		-0.2	- 4.5		24	
July 1959		2.4			2.6		12
	March 1961		0.1	- 2.3		20	
January 1966		4.0			4.1		58
	January 1967		1.3	- 2.7		12	
January 1970[a]		6.6			7.9		36
	October 1971		2.8	- 3.8		21	
July 1974		12.6			15.4		33
	April 1976[b]		4.7	- 7.9		21	
Average, 1947-76		7.4	0.3	- 7.1	8.1	19	28

Note: The chronology is based upon the rate of change in the Consumer Price Index, seasonally adjusted, computed over six-month intervals and expressed at annual rate. The rates are dated in the middle month of the six-month interval. For example, the rate for April 1976 (4.7%) is the change from January to July 1976, annualized. Except as noted the dates through 1970 are as given in Geoffrey H. Moore, *The Cyclical Behavior of Prices*, Bureau of Labor Statistics, Report 384, p. 7, 1971. This report includes a discussion of the relative merits of different price indexes and alternative measures of their rates of change for this purpose.

[a]Revised, due to a change in seasonal adjustment. The corresponding dates given in *The Cyclical Behavior of Prices* were August 1954 and February 1970.

[b]Tentative.

Table 2
Relation between Business Cycle and Inflation Chronologies

Business Cycle		Inflation Rate (CPI)		Lead (−) or Lag (+) of Inflation Rate at Business Cycle (mos.)	
Peak (1)	Trough (2)	Peak (3)	Trough (4)	Peak (5)	Trough (6)
Nov. '48		Oct. '47		−13	
	Oct. '49		Nov. '48		−11
a		Nov. '50		a	
	a		Nov. '52		a
July '53		July '53		0	
	May '54		Sept. '54		+ 4
Aug. '57		July '56		− 13	
	Apr. '58		July '58		+ 3
Apr. '60		July '59		− 9	
	Feb. '61		Mar. '61		+ 1
a		Jan. '66		a	
	a		Jan. '67		a
Dec. '69		Jan. '70		+ 1	
	Nov. '70		Oct. '71		+11
Nov. '73		July '74		+ 8	
	Mar. '75		Apr. '76		+13

[a]No corresponding business cycle turn.

The "sooner or later" phrases in the preceding sentences are made more precise by the entries in columns 5 and 6 of Table 2. On three occasions the decline in the inflation rate began before the business cycle peak, twice they coincided or virtually coincided, and once the downturn in the inflation rate lagged eight months behind the business downturn. This was the most recent turn, and it will be recalled that the decline in activity was relatively moderate until the autumn of 1974. Only one of the upturns in the inflation rate preceded the business cycle upturn, three followed it by just a few months, while the last two lagged by about a year. Hence it appears that downturns in the inflation rate tend to come early and upturns tend to come late relative to the business cycle turns. But "sooner or later" the turns do come, without exception.

Moreover, it is also apparent from the record, barring the two occasions when the economy slowed down markedly but did not enter upon a contraction of business cycle proportions, that downturns in the rate of inflation have not occurred except when recessions occurred. In other words, a slowdown or an absolute decline in real demand have been both necessary and sufficient to reduce the inflation rate.[2] The 1973-1975 recession reconfirmed that generalization, although it took longer than usual for it to happen.

If, as Table 2 demonstrates, the rate of inflation reaches its lowest point in the vicinity of a business cycle trough, inflation must begin to accelerate when economic activity is at a fairly low ebb, well before the economy has fully recovered from recession. As Arthur Burns expressed it more than a quarter of a century ago, "inflation does not wait for full employment."[3]

A few years earlier (1946), when he assumed the post of Director of Research at the National Bureau, Burns listed this point among several that the National Bureau's studies of business cycles would throw light upon. It is useful to ponder the list as one considers the economic policy issues that are being discussed today.

> We hope that our quest of the lessons of experience will aid other students, as well as laymen who must wrestle practically with business cycles. Whether a cyclical downturn can be recognized promptly enough to permit immediate governmental intervention, whether cost-price relations are of slight consequence in the termination of a boom, whether inflationary tendencies become important only as 'full employment' is approached, whether the volume of the circulating medium rises and falls in close sympathy with aggregate activity, whether minor cycles mainly reflect inventory fluctuations, whether the volume of investment is materially affected over periods of business-cycle length by the rate of change in consumer spending — these and similar matters are, after all, not metaphysical questions. True, the most painstaking studies of experience will not always lead to conclusive answers; but they should at least narrow the margins of uncertainty, and thus furnish a better basis than now exists for dealing with grave issues of business-cycle theory and policy.[4]

In recent Congressional testimony, in his present role as Chairman of the Federal Reserve, Burns recalled the findings of business cycle studies on the "full employment" issue:

> The historical record of business cycles in our country clearly demonstrates . . . that the prices of final goods and services gather substantial upward momentum well before full utilization of resources is achieved.[5]

Space does not permit a full demonstration of the uses of the inflation chronology. Suffice it to say that, among other things, one can use it to identify leading indicators of inflation, such as the prices of industrial crude materials; roughly coincident indicators of inflation, such as unit labor costs; and even lagging indicators of inflation, among which must be counted many of the forecasts of inflation, which often turn out to be too late as well as too little.[6] Judging from the rather sorry record of price forecasting, it would be well if as much attention were devoted to the timely and systematic study of indicators of inflation as has been devoted to indicators of recession and recovery. The inflation chronology, one hopes, will serve that end.

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[2]The 1962-1964 slowdown in the growth cycle chronology is not matched by a clearcut decline in the inflation rate. This is the only instance where a slowdown was not sufficient to reduce the inflation rate, but it was already close to zero.

[3]Introduction to Wesley C. Mitchell's *What Happens during Business Cycles: A Progress Report*, NBER, 1951, p. xxi.

[4]*Economic Research and the Keynesian Thinking of Our Times*, 26th Annual Report, NBER, 1946, p. 27.

[5]Statement before the Committee on the Budget, United States Senate, March 22, 1977.

[6]See the April 1977 issue of the *NBER Reporter*, "The President's Economic Report: A Forecasting Record." Also, the reference cited in Table 1 and my "Lessons of the 1973-1976 Recession and Recovery," American Enterprise Institute, forthcoming.

New Leading Indexes for Seven Countries

Geoffrey H. Moore and Philip A. Klein

What are the prospects for continued growth in economic activity in the seven industrial countries that recently attended the summit conference in London? One way to appraise the likelihood of continuing growth or emerging recession is to examine leading indicators. Orders placed for goods, the rate of accumulation of inventories, adjustments in the workweek, contracts for new construction, and profit margins are among the factors that National Bureau studies have shown to often foreshadow changes in output and employment. For the United States, a composite index based upon a dozen such leading indicators is published currently by the Department of Commerce. Only a few other countries have similar indexes and they are generally not comparable in content or method.

This situation is being remedied in the National Bureau's work on international indicators. As the accompanying table shows, the Bureau's leading indexes for the seven countries through December 1976 exhibit considerable strength. All countries except Canada were advancing in the last half of 1976 at rates equaling or exceeding their long-run average. In the United States, recent information shows the leading index rising faster during the six months ending March 1977 than during the first half of 1976.

The uses and limitations of these indexes in such applications as forecasting foreign trade are under study, and a cooperative experimental program with the OECD and the national statistical agencies in several countries is getting under way. Before long, we hope, economists interested in the international scene will be able to test the new system of indicators for themselves.

Leading Index Growth Rates
(percentage change at annual rate)

	June 1975 to Dec. 1975	Dec. 1975 to June 1976	June 1976 to Dec. 1976	Ten Year Average, 1966-76
United States	16	9	4	3
Canada	2	8	−2	4
United Kingdom	5	9	5	2
West Germany	10	6	10	4
France	2	15	5	5
Italy	−1	4	6	4
Japan	13	24	10	8
Six countries except U.S.	6	13	7	5
Seven countries	11	11	5	4

Note: The indexes are constructed so that their ten-year average growth rate, 1966-1976, is equal to the growth rate in real GNP in the respective countries during the same period. The six- and seven-country composite indexes are weighted by each country's GNP in 1970, in U.S. dollars.

NBER Research Report: Studies in the Organization of Markets

An NBER's research program on the organization of markets and the performance of the American economy was launched in 1971 under the leadership of Michael Gort, Professor of Economics at the State University of New York, Buffalo, with the support of the American Association of Advertising Agencies, the National Science Foundation, the Rockefeller Foundation, and others. Consistent with NBER tradition, these studies do not make policy recommendations but focus on the development of information basic to policy formulation. Thus, even specific studies on, say, advertising are not designed to produce operating guidelines for individual firms, but to augment our understanding of the economic setting within which the advertising industry functions.

Research on industrial organization, as Professor Gort observes in a recent overview of this project, was not new to the National Bureau in 1971. Starting with Ralph Epstein's study on corporate profits published in 1934, he lists, among others, the work of Milton Friedman and Simon Kuznets on income from independent professions, George Stigler's analyses of the service industries and the rates of return in manufacturing, Ralph Nelson's work on mergers, Gort's own 1962 study on diversification, Victor Fuchs's studies on the service sector and the health care industries, and John Meyer's work on the diffusion of process innovation. What was needed was a renewed impetus to research in this area. The support from the AAAA and the other funding agencies, therefore, came at a very opportune time. Thanks to this support, a well-established program of research is now under way. The studies directly financed by the grant from the AAAA are either published or approaching publication, and a number of other related studies are near completion.

Of five studies sponsored by the American Association of Advertising Agencies, three deal with advertising directly: "Consumer Information and Advertising" by Phillip Nelson and two studies by Henry Grabowski — "The Effects of Advertising on the Interindustry Distribution of Demand" and "The Effects of Advertising on Intraindustry Shifts in Demand." The other two studies focus on diversification and concentration: "Specialization, Diversification, and the Allocation of Corporate Resources" and "Concentration and Profit Rates." They were carried out by Michael Gort in collaboration with, respectively, Henry Grabowski and Robert McGuckin and Rao Singamsetti.

Various other studies in the overall research program on industrial organization are of a complementary nature. For example, a study by Henry Grabowski and Dennis Mueller deals with rates of return to corporate investment in plant and equipment, R&D, and advertising. Another one, by John Meyer and Alexander Morton, examines the relationship of productivity and profits in the railroad industry. Meller, Leniz, and Swinburn have analyzed concentration in Latin America, and Michael Gort is completing a study on the diffusion of product innovations. Finally, Henry Grabowski and John Vernon are conducting research on the effects of product quality regulation on innovation in the pharmaceutical industry, and a study by Robert Halvorsen on the demand for energy seeks to develop information essential for a regulatory policy on energy.

The National Bureau's Machine-Readable Data Bank

Charlotte Boschan

As a by-product of its research the National Bureau is maintaining a machine-readable data bank which it makes available to outsiders at cost. Originally, the bank was established in order to eliminate, within the Bureau, the duplication involved in updating and key punching the same information by various different Bureau projects. An organized up-to-date machine-readable collection of time series was expected to be a useful research tool in business cycle and other studies. At about the same time, in the beginning of

1969, a group of economic forecasters from about twenty large New York banks and insurance companies were looking for a way to avoid the duplication among their firms in maintaining up-to-date background information for their forecasts. The provision of basic economic data used in or developed by its research has long been an accepted function at the National Bureau. Data developed and analyzed by the Bureau play a prominent role in such government publications as *Historical Statistics, Business Conditions Digest*, and *Long-Term Economic Growth*. The Bureau has published several source books, such as the second volume of *Business Cycle Indicators* (1958) and the *Source Book of Statistics Relating to Construction* (1966), and has always made its unpublished material readily available. Thus, it was a natural step for the Bureau to develop and maintain a machine-readable data bank of U.S. time series for its own use, and to make it available to others at cost — a modern form of publication.

Several years later a similar need arose within the Bureau for a centralized library — or data bank — of large collections of data on magnetic tape. Without this centralization, several different projects would — and sometimes did — purchase, or even process, the same expensive data.

The contents, characteristics, and availability of the time series data bank are described below; those of the magnetic tape collection will be described in a subsequent issue of the *Reporter*.

1. Content of Data Bank

At present about 3,000 monthly, quarterly, and annual time series are in our data bank. Of these, half refer to the National Income and Product Accounts (see Table 1). The time period covered is from 1946 to date, whenever possible. All series are adjusted for seasonal variation wherever such adjustment is needed. Usually these adjustments are made and published by the source agency, but whenever they are inadequate or not available we make the adjustment and provide it in the bank. In some cases both the adjusted and the unadjusted series are carried. Usually the figures pertain to the economy as a whole, but several activities are given by industry, on at least a two-digit SIC level.[1] The bank also contains some forecasts and projections. Apart from those available from government agencies — such as the Census Bureau's projection of the population — we maintain the median quarterly forecasts of eleven economic variables resulting from the ASA/NBER Forecast Survey.[2]

2. Availability

Since NBER is a nonprofit institution and maintains its data bank as a public service, the bank is available to everybody, at cost. In practice, access is provided through time-sharing companies, especially those that have enough users to make it economical for NBER to update its series every day, usually within no more than two working days of the time the new data are published. We find that at least twenty users per system are needed to make this financially feasible. Also, since we update all systems from the same paper (or magnetic cassette) tape, the host time-sharing company provides the software to accept our daily update paper tape. At the present time, these time-sharing companies are: Rapidata, General Electric, The Service Bureau Company, and Boeing Computer Services, which houses the Wharton model. Several other time-sharing companies either do not have enough users or do not need such frequent updating. To these companies we provide periodic, usually monthly, magnetic computer tapes containing all series as up-to-date as possible. These companies are: The Computer Company, Computer Science Corporation, Comshare, Inc., Conference Board-Canada, Informatics, Multiple Access, Inc., National CSS, Inc.,

[1]These include Industrial Production, Capacity Utilization, Orders, Shipments, Inventories, Plant and Equipment Expenditures, Prices, Employment, Hours and Earnings, Productivity, and Profits.

[2]The ASA/NBER Forecast Survey is a quarterly survey conducted jointly by the American Statistical Association and NBER. Respondents are members of the Economics and Statistics Section of the ASA and include about fifty leading business, academic, and government economists professionally engaged in forecasting. Data from the surveys are analyzed by NBER and published in ASA's *American Statistician* as well as in NBER's *Explorations in Economic Research*.

Table 1
Content of Data Bank

	No. of Series		
	Annual	Quarterly	Monthly
National Income and Product Accounts	1127	570	29
Finance			
Money Stock Measures			26
Bank Reserves			13
Commercial Bank Assets			15
Money Market Rates		2	31
Security Market Prices, Yields and Earnings		1	19
Mortgage Yields and Debt Outstanding		8	9
Exchange Rates			6
Credit and Credit Delinquencies		2	23
Federal Government Finance		9	16
U.S. International Transactions			
Balance of International Payments		22	3
Merchandise Imports and Exports			18
Plant and Equipment Expenditures			
Actuals with Two Quarter Projections		30	
First Expectations		11	
Second Expectations		11	
Manufacturing and Trade			5
Retail Trade Sales and Inventories			24
Wholesale Trade Sales and Inventories			17
Manufacturers — Shipments			49
Manufacturers — Inventories			56
Manufacturers — Orders and Unfilled Orders			68
Manufacturers — Sales and Inventory Anticipation		6	
Industrial Production Index			110
Capacity Utilization Rate		43	
Construction, Housing Starts and Vacancies	5	1	44
Prices			
Wholesale Price Index			66
Consumer Price Index			119
Other Prices			4
Population, Employment and Earnings			
Population Estimates and Projections	75	1	4
Labor Force	10		10
Employment			80
Unemployed and Unemployment Rates			33
Weekly Hours			80
Hourly and Weekly Earnings		5	59
Productivity and Unit Labor Costs		32	
Other Labor Series (Labor Turnover, Etc.)		2	14
Forecasts (ASA/NBER Survey)		44	
International Series			19
Other Series		20	9
	1217	820	1078

On-Line Systems, Inc., Scientific Time Sharing Corporation, J. P. Sharp Associates, Time Sharing Resources, Tymshare, Inc., and United Computing Company. Altogether about 150 companies use our data bank on one of these time-sharing systems. About 35 colleges and universities use a version of our tape for research or for teaching purposes, and about eight access the data bank via a time-sharing system.

3. Documentation

A new directory of the time series in the bank was released in November 1976 and is available at cost ($5.00). To enable users to locate the code names of the series they need, the series are arranged by subject matter and source in the directory, rather than in the alphabetic order of their code names — as is usually done. At present, a user who is familiar with the printed sources will find our directory easy to use, but a newcomer to the field may have difficulties. In addition to the printed directory, on-line documentation is available on most time-sharing systems which offer the data bank. In most cases, depending on the editing capability of the particular time-sharing system, one can use an Editor Program to excerpt names and short descriptions of all series pertaining to a given subject.

4. Cost

NBER is compensated for the use of its data bank by the individual user at a rate of $80.00 a month for daily updates plus a one-time start-up fee of $100.00, or $65.00 a month for periodic updates plus the start-up fee. This does not include costs for computer use, of course. Individual tapes are sold at $200.00 per tape, except to academic institutions, which pay only $65.00 per tape.

5. Future Developments

The Bureau's project on International Economic Indicators is planning to make its basic data (about 25 indicators for each of seven or more countries) available to subscribers. Since this is a rather specialized set of data, it will be treated independently of the existing data bank. New measures, such as leading and coincident composite indexes, will be included with the data, and we are planning to ask subscribers to contribute to the cost of processing and analysis.

Current NBER Publications

Here are three brand new National Bureau titles: *Education as an Industry* (Dean T. Jamison, Joseph N. Froomkin, and Roy Radner, eds.), *Substituting a Value-Added Tax for the Corporate Income Tax: First-Round Price Effects and Their Implications* (Stephen P. Dresch, An-loh Lin, and David Stout), and *Indexation, the Brazilian Experience* (*Explorations in Economic Research*, volume 4, number 1, N. Ishaq Nadiri and Affonso C. Pastore, eds.). They immediately communicate to the reader the broad scope of the National Bureau's research activities, important to readers active in business and government as well as the academic sector.

Education as an Industry, an outgrowth of an NBER conference on that topic, deals with the internal economics of education — costs, efficiency of resources, and output in the form of achievement — problems in the forefront of public interest. One of its significant findings, for example, relates to compensatory education for disadvantaged students, an area of great current concern among policymakers. It offers the hopeful view that certain types of input into the educational process can be identified that promise to be helpful to the achievement of such students. The volume also provides a thorough documentation and analysis of the trend toward rising unit costs of higher education. Finally, in a section on the relationships between school resources and achievement, previous findings of an only tenuous relationship are confirmed and data and methodological problems hampering more definitive conclusions are analyzed.

Our second example, as the title implies, examines the price effects of substituting a value-added tax for the corporate income tax, particularly on income distribution, the rate and composition of investment, and on international trade. On the trade effects the authors find that it is the elimination of the corporate income tax that affects the balance of trade, not the imposition of a value-added tax, which is actually neutral in impact by itself. If eliminating the separate income tax results in lower prices for exports and import-competing goods, the trade balance should improve — but the authors expect this improvement to be no greater than what would result from alternative dollar devaluation of some 5 percent.

Finally, the latest volume of NBER's *Explorations in Economic Research*, devoted in its entirety to the topic of indexation, throws light on a complex and controversial issue in the fight against the universal enemy — inflation. It presents some of the papers of a conference sponsored by the National Bureau and the University of São Paolo to examine the indexation experience of Brazil, the outstanding example of a comprehensive indexation program and therefore an ideal subject of study. This information should, once again, prove of great and immediate interest to policymakers.

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