

# REPORTER

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

SEPTEMBER 1977

## Editorial Message

Solid evidence through empirical research, objectively obtained and impartially presented, is what the National Bureau stands for. Your new *Reporter* endeavors to give you a glimpse of this concept in action and of some of the people who are responsible for it.

What emerges immediately is the wide range of the Bureau's research and the deep concern about today's important issues by those who conduct it. In this September *Reporter* you can read about such NBER personalities as Eli Shapiro, Milton Friedman, and Victor Fuchs, among others — and such diverse topics as monetary trends in the United States and the United Kingdom, America's health, cost-price relations in the business cycle, taxation and economic growth, and industrial diversification. The latter two are presented in research summaries for readers interested in material of a somewhat more technical nature.

The contributions from our West Coast center illustrate the *Reporter's* aim — to be pursued in the future — of presenting also as wide a geographical representation as possible of the National Bureau's activities. Another feature we hope to continue is the inclusion of the summarized research reports. Reader comment is cordially invited on this as well as any other aspect of the *Reporter*.

## Table of Contents

Editorial Message. . . . .	1
Current NBER Conference. . . . .	1
NBER Personalities. . . . .	2
Eli Shapiro. . . . .	2
Monetary Matters: Milton Friedman. . . . .	3
Health Horizons: Victor Fuchs. . . . .	3
Cost-Price Relations in the Business Cycle. . . . .	4
NBER Research Summaries. . . . .	8
Taxation and Capital Accumulation. . . . .	8
Specialization, Diversification, and the Allocation of Corporate Resources. . . . .	11
The National Bureau's Data Bank — The Magnetic Tape Collection. . . . .	12
Current NBER Publications. . . . .	13

## Current NBER Conference

As this issue of the *NBER Reporter* is going to press, an international conference is taking place in Washington, D.C. under the joint sponsorship of the National Bureau and the Program of Joint Studies on Latin American Integration (ECIEL) on the topic "Education and Economic Development in Latin America." Scheduled for September 19-21, the conference is coordinated by Paul Wachtel of New York University and Jorge A. Sanguinety of ECIEL under the direction of NBER's M. Ishaq Nadiri.

The most comprehensive entry on the agenda is a study by Claudio de Moura Castro and Jorge A. Sanguinety on the costs and determinants of education in ten Latin American countries. Based on information on the students' family background, anthropometric data, teacher characteristics, and school conditions, it is reminiscent of the U.S. survey in the Coleman Report and the nineteen-country Stockholm survey of the International Association for the Evaluation of Educational Achievement.

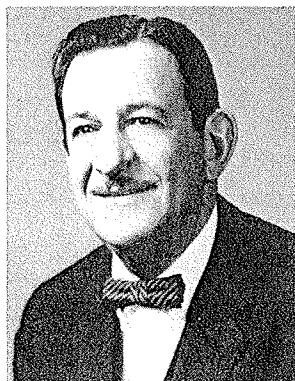
The findings of this ten-country survey are supplemented by a long list of individual analyses, some focusing on specific geographic locations, others on specific issues, including the effects of education on occupational mobility.

Discussants tentatively scheduled include Raul Allard (OAS), Mary Jean Bowman (Chicago), Byron Brown (Michigan State), Dov Chernichovsky (Brookings), Linda Edwards (NBER), Herbert Gintis (Princeton), Michael Grossman (NBER), Jean Pierre Jallade (IIEP, UNESCO, Paris), Thomas LaBelle (UCLA), Kathleen McNally (Joint Council on Economic Education), George Psacharopoulos (London School), Marcelo Selowsky (World Bank), John Simmons (World Bank), Paul Wachtel (NBER and NYU), Robert Willis (UCLA), and Edward Wolff (NBER).

★ ★ ★

---

## NBER Personalities



**Eli Shapiro**

Here is a portrait of an "NBER personality" indeed: a man equally at home in the academic and business worlds; a citizen whose expertise and impartiality have made him a sought-after advisor to the government as well as private sectors over a period of many years; and an economist who has been closely associated with the National Bureau for most of his professional career.

For Eli Shapiro was one of those "bright young men" who got an invaluable early training at the end of the Thirties on the National Bureau's Financial Research Project, fondly recalled by Bureau veterans as the "Hillside Program." Working in the tree-shaded atmosphere of the charming old Riverdale mansion<sup>1</sup> under the leadership of Ralph A. Young (later Senior Advisor of the Fed's Board of Governors) and Raymond J. Saulnier (later Chairman of the Council of Economic Advisers), young Dr. Shapiro (Ph.D. Columbia, 1939) was responsible, among other things, for producing all statistical tabulations for two chapters of the 1940 study *Personal Finance Companies and Their Credit Practices*, the first in a series on consumer installment financing. He continued as a consultant to NBER's Financial Research Project till 1942 (while working for the Treasury and the Office of Price Administration), and rejoined the Bureau's research staff during 1955-1957. More recently, he has been active on NBER's Board of Directors since 1974, a member of its Executive Committee since 1976, and chairman of its Development Committee for 1977-1978.

It is typical of Dr. Shapiro's unusual combination of theoretical and practical expertise and executive talents that he is simultaneously the Alfred P. Sloan Professor of Management at the Massachusetts Institute of Technology and Vice Chairman and Director of the Travelers Corporation and its various subsidiaries. In addition, his outside directorships include Avis, Inc., the Dexter Corporation, the Federal Home Loan Bank of Boston, and the Norlin Corporation, and he serves as Trustee of the American College (Bryn Mawr, Pa.) and Mount Holyoke College (South Hadley, Mass.) as well as on the National Board of Directors of the Institute of Living (Hartford, Conn.). He is also on the Finance Committee of the Rockefeller Brothers Funds, Inc. and on the Advisory Committee of the Center for the Study of Financial Institutions of the University of Pennsylvania Law School, and is chairman of the Financial Advisory Committee of the Greater Hartford Council on Economic Education.

His current post at the Massachusetts Institute of Technology is the latest in a distinguished academic career: Professor of Finance at the University of Chicago School of Business (1946-1952), Professor of Finance and Associate Dean for Academic Affairs at the Massachusetts Institute of Technology School of Industrial Management (1952-1961), and Professor of Finance at Harvard's Graduate School of Business (1962-1968), where he was appointed Sylvan C. Coleman Professor of Financial Management in 1968. He is a Fellow of the American Academy of Arts and Sciences and a member of the American Economic Association, the American Finance Association, and the Council on Foreign Relations.

Serving the government in the early Forties, Dr. Shapiro was economic analyst in the U.S. Treasury Department, the Office of Price Administration, and the Wage Stabilization Board. At various points throughout his later career he was consultant to the Secretary of the Treasury, the Board of Governors of the Federal Reserve System, the Task Force on Anti-Inflation Policy, and the Task Force on Economic Growth. What may be his most important contribution, among many others, is his leadership as Deputy Director of Research on the Commission on Money and Credit during the 1958-1961 period. Known to be close to his heart, this massive research project pro-

---

<sup>1</sup>Maintained till 1954, when it was returned to the original donor because of difficulties of upkeep.

duced a series of invaluable treatises and recommendations, made available to Congress, on various aspects of the U.S. financial system. Finally, the Committee for Economic Development also benefited from his services — on the Research Advisory Board (1962-1965) and as Project Director (1965-1968).

In the face of all these time-consuming activities, Dr. Shapiro has managed to produce an impressive list of books and many articles for the *American Economic Review*, the *Journal of the American Statistical Association*, the *Journal of Finance*, *Management Science Review*, and many other journals.

On a more personal note, Eli Shapiro is known for his pleasant conversation and sharp wit. He is married and has two children, Stewart and Laura. Dr. and Mrs. Shapiro make their home on Boston's Beacon Street.

### **Monetary Matters: Milton Friedman**

When Milton Friedman was awarded the 1976 Nobel prize for economics the international press devoted considerable space to his work, much of it conducted under NBER auspices. Particular attention was paid to *A Monetary History of the United States, 1867-1960*, written in collaboration with the National Bureau's Anna Schwartz. The *London Times*, calling him "a worthy successor to the best of the English-language tradition in economics from Adam Smith to Lord Keynes, encompassing such giants as David Hume, Malthus, Ricardo, John Stuart Mill, and Alfred Marshall," termed the work a "massive study . . . [in which] he sought to show a systematic correlation between the rate of change in the money supply and the rate of change a year or so later in national expenditure and output valued at current prices."<sup>1</sup> The *Economist* (in an article by James Tobin) referred to the book as "his monumental monetary history," an "indispensable treatise packed with theoretic insights and policy analysis as well as historical narrative."<sup>2</sup> *Le Monde* in Paris described the work as "la monumentale histoire monétaire des Etats-Unis,"<sup>3</sup> while the *Wirtschaftswoche* called it "eine monumentale Geldgeschichte der Vereinigten Staaten."<sup>4</sup> Thus, whether in English, French, or German, the study is globally con-

sidered "monumental."

It is of great interest, therefore, that a worthy successor is well on its way: another NBER-Milton Friedman-Anna Schwartz collaboration is approaching its final stages of preparation. Now that Professor Friedman has retired from the University of Chicago and moved to California, where he was appointed Senior Research Fellow at the Hoover Institution at Stanford University, it is hoped that the work will proceed rapidly to its completion. Tentatively labelled *Monetary Trends in the United States and the United Kingdom*, it covers roughly a century for both countries and uses as basic observations average values over cycle phases to eliminate short-term fluctuations. The authors examine the behavior of money, nominal income, prices, output, and interest rates; the demand for money and the movement of velocity; the division of changes in nominal income between prices and output; the relation of money and prices to interest rates; and finally, long swings in economic activity. It has been possible in most cases to combine the data for the two countries in a single analysis — an unprecedented approach.

### **Health Horizons: Victor Fuchs**

Victor R. Fuchs, vice president of the National Bureau and director of its Palo Alto office, believes that changes in personal behavior and life style offer the greatest potential for improving America's health. He also believes that this is difficult to achieve, and that it is basic research in this area rather than in others that have been more publicized that may hold the key to the problem.

Thus the recent boost to NBER's health economics program by the Henry J. Kaiser Family Foundation of Palo Alto is important news. The program, supported by a \$200,000 grant for three years, will be directed by Fuchs, professor of economics at Stanford University and a member of the Institute of Medicine of the National Academy of Sciences. It will focus on such areas as health-preserving behavior, the relation between work and health, the physician's role in determining the demand for medical care, and the utilization of surgery by various socioeconomic classes.

<sup>1</sup>*London Times*, October 15, 1976.

<sup>2</sup>*The Economist*, October 23, 1976.

<sup>3</sup>*Le Monde*, October 16, 1976.

<sup>4</sup>*Wirtschaftswoche*, 43, October 22, 1976.

---

## Cost-Price Relations in the Business Cycle

Geoffrey H. Moore

It's a bit hard to believe, but the relationship between costs and prices that has been developing during 1977 was described by an economist in 1913. The economist was Wesley C. Mitchell, and he was thirty-nine when his 610-page treatise, *Business Cycles*, was published. One of the book's themes was that, as business recovered from a recession, at first prices went up faster than costs, but later on, as the expansion continued, costs began rising faster than prices. This produced a profit squeeze. Eventually the shift in the profit outlook had a depressing effect on business commitments and was one of the factors contributing to the start of another recession.

Mitchell, who was one of the founders of the National Bureau and its Director of Research for twenty-five years, encouraged further investigation of this hypothesis, but did not live to see the data that were to buttress it firmly. Indeed, these data were not published until 1972, although earlier information showed in more tentative fashion that costs and prices followed the pattern that Mitchell had ascribed to them. What happened in 1972 was that the Bureau of Labor Statistics began publishing quarterly figures on costs and profits per unit of output for all nonfinancial corporations, together with the comparable prices received. The data covered the period since 1948, and hence included four business cycles. Every one of them followed the path that Mitchell had laid out in 1913.

Since 1972 we've again witnessed the tendency for costs to rise faster than prices as a recovery matured. During the first two years of the recovery following the 1969-1970 recession prices rose faster than costs per unit of output. But during the last year of that recovery, prior to the recession of 1973-1975, costs rose faster than prices.

The recovery from the recession of 1973-1975 is now in its third year. True to form, during the first year and a half prices rose faster than costs, and profits per unit of output rose sharply. Late in 1976 and during the first half of 1977, costs began rising faster than prices. Profits per unit of output began to fall. Another crucial stage in Mitchell's cost-price pattern had apparently arrived.

Charts 1, 2, and 3 give the record since 1948 in three different forms, though all tell essentially the

same story. Chart 1 compares unit labor costs with prices in the nonfarm business sector, Chart 2 does the same for the nonfinancial corporate sector, and Chart 3 compares total unit costs with prices in the corporate sector. The data underlying Chart 1 have a wider coverage than the corporate data, and the figures for each quarter are published about a month sooner, but they are limited to unit labor costs and hence do not show directly what is happening to profits. The similarity between Charts 2 and 3, however, demonstrates that labor costs are the dominant factor, and that movements of profits per unit of output are governed to a large extent by the relation between unit labor costs and prices. One can, therefore, use the more promptly available data for the nonfarm business sector to get an early indication of what the corporate data will show.

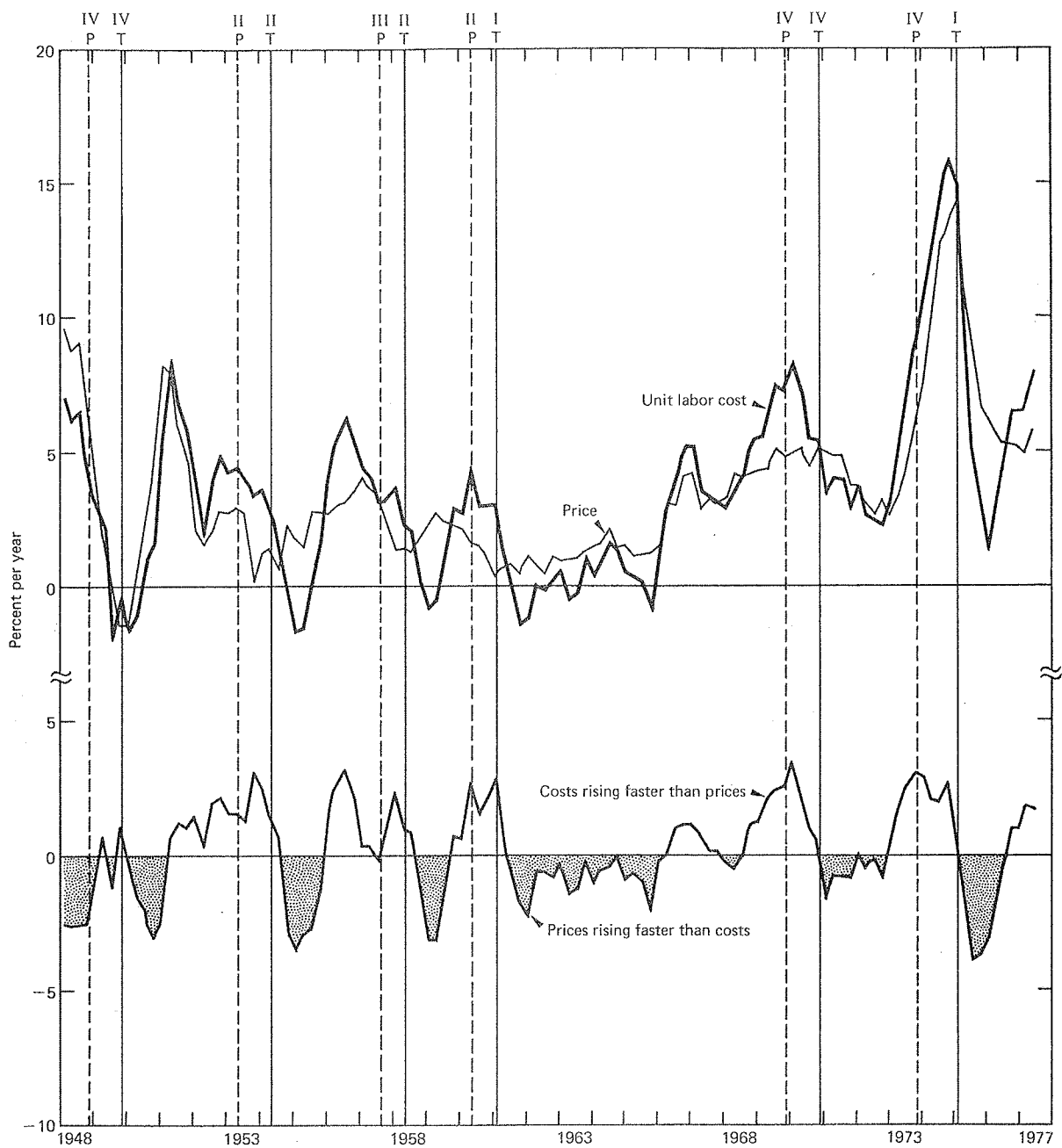
Mitchell believed that an understanding of the factors underlying the changing relations between costs and prices was vital to an understanding of the riddle of the business cycle. He would have agreed too, I am sure, that it is vital to an understanding of the process of inflation. Why do prices rise faster than costs in the early stages of recovery? Why do costs rise faster in the later stages? Do prices pull up costs or costs push up prices, and what accounts for the variation in the strength of the push or pull? Why is the interval when costs are rising faster than prices sometimes very long, as in 1966-1969, and sometimes quite short, as in 1959-1960? What implications do the changes in cost-price relations have for capital investment, labor contract negotiations, stock prices? Is an economy in which costs are rising faster than prices in need of more stimulation to keep the recovery going, or less stimulation to prevent further acceleration of inflation? What kind of economic policy would best fit the new situation, and hold down the rise in both costs and prices?

Some of these questions have been dealt with in studies at the National Bureau and elsewhere.<sup>1</sup> Mitchell himself examined the factors that caused costs to encroach upon prices as an economic recovery built up steam. But in general economists have neglected this phenomenon and we do not know as much about it as we should. There is, in my view, a major need for studies in this area. Most work on business cycle policy has been devoted to countering recession. It is time to recognize the need for countering some of the tendencies that develop during prosperity. Mitchell pointed the way more than sixty years ago when he pondered the significance of the phenomenon we are once again witnessing.

---

<sup>1</sup>For further reading: Burns, Arthur F., *The Business Cycle in a Changing World* (New York: National Bureau of Economic Research, 1969), pp. 25-42, 79-84; (Continued on p. 8)

Chart 1 — Rates of Change in Prices and Costs, Nonfarm Business Sector, 1948–1977 (percent change from same quarter year ago)



Note: Vertical lines are quarterly peaks (P) and troughs (T) of business cycle.

Chart 2 — Rates of Change in Prices and Costs, Nonfinancial Corporations, 1949–1977 (percent change from same quarter year ago)

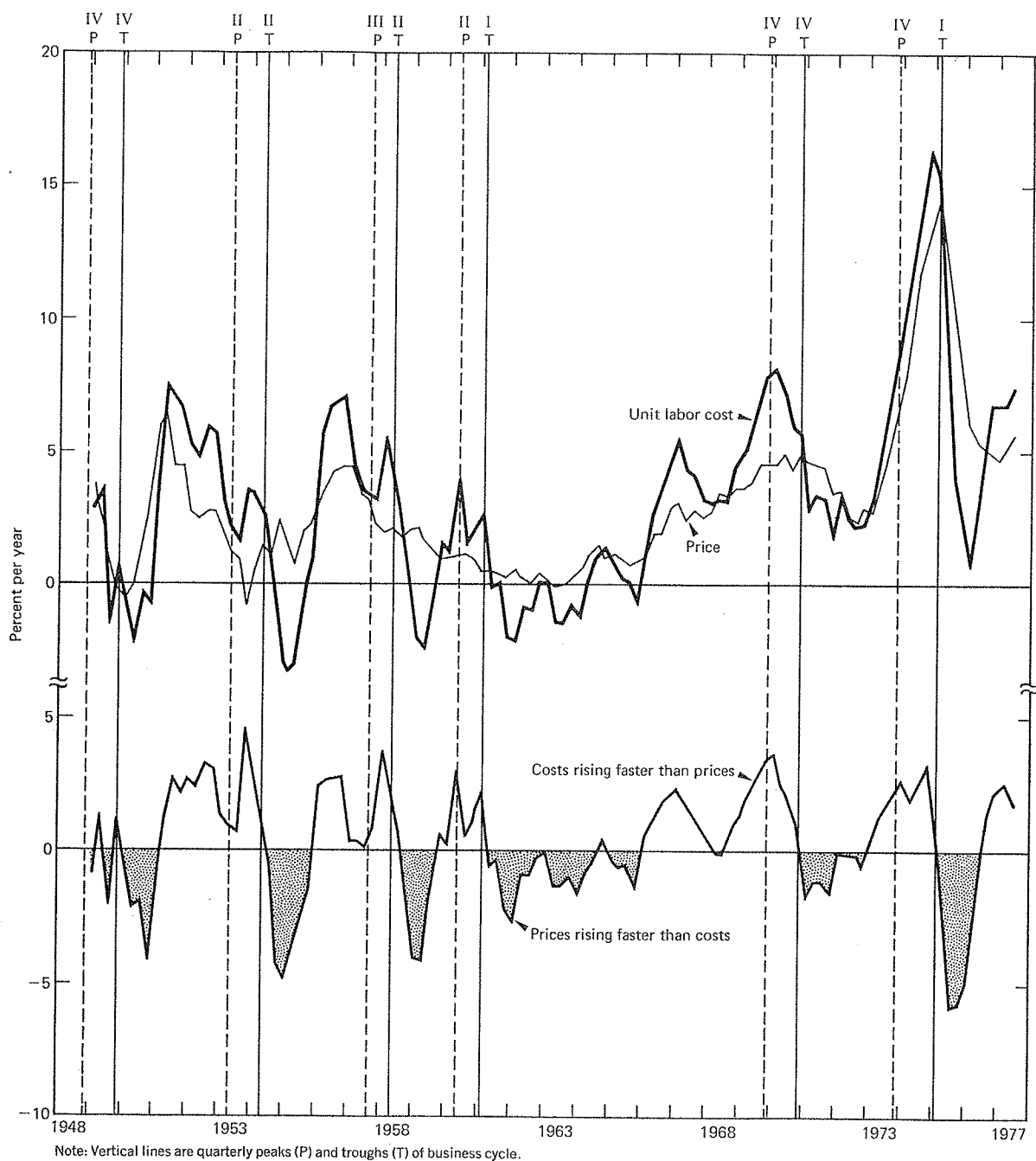
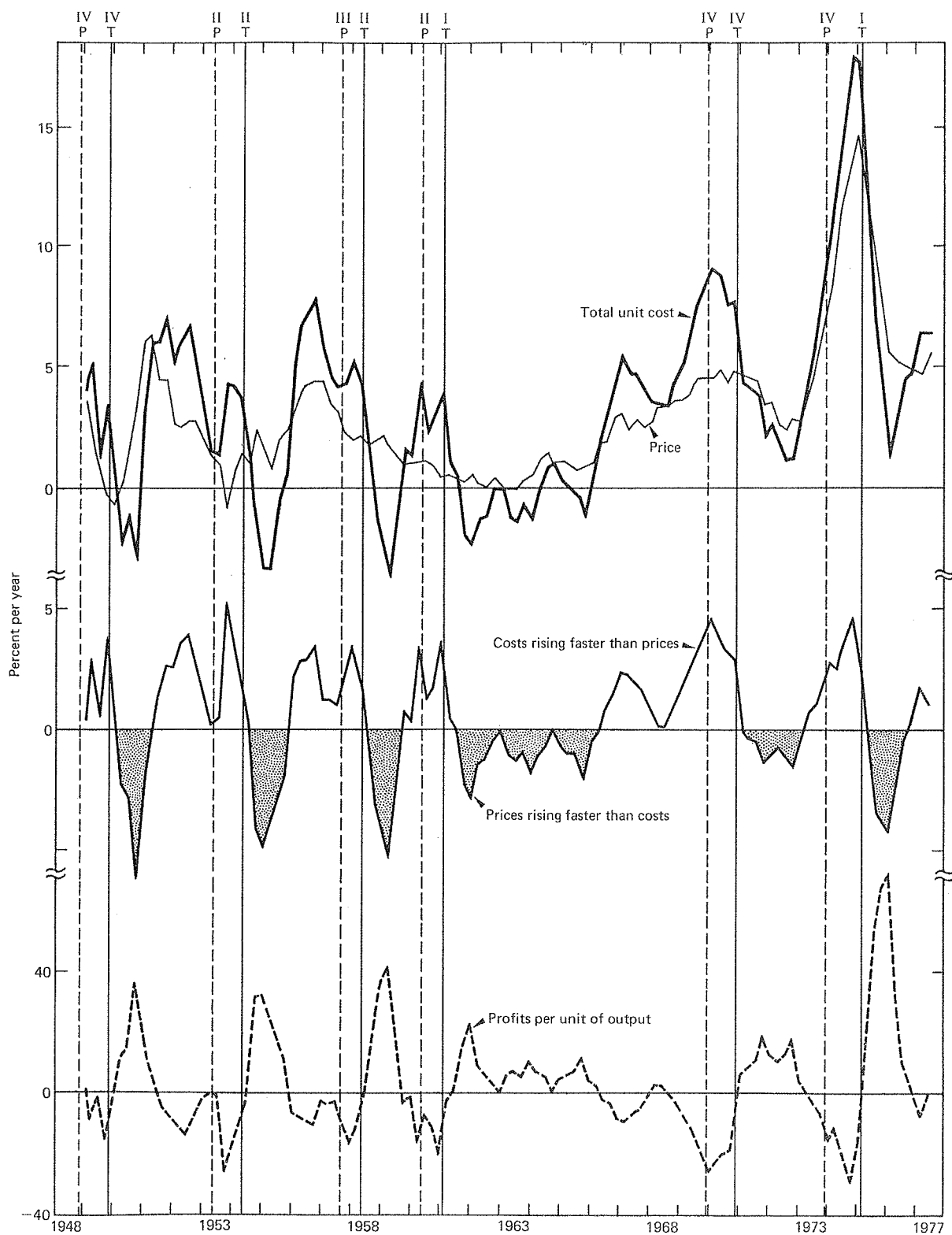


Chart 3 — Rates of Change in Prices, Costs and Profits, Nonfinancial Corporations, 1949–1977 (percent change from same quarter year ago)



Note: Vertical lines are quarterly peaks (P) and troughs (T) of business cycle.

# NBER Research Summaries

## Taxation and Capital Accumulation

Michael J. Boskin

*The author (NBER and Stanford University) is engaged in a major reexamination of the economic effects of the taxation of human and nonhuman capital. The following summary represents the most important results to date. They point to a positive relationship between private saving and the rate of return — with significant policy implications. For example: Lowering taxes on interest income would eventually raise the level of saving and capital formation and thus also serve to raise the income of labor.*

### 1. Introduction

The effect of rates of return on economic behavior, particularly on saving and consumption, has been a central concern of economists at least since the development of classical macroeconomics. Not only viewed as the mechanism for equating saving and investment in pre-Keynesian macroeconomic models, the rate of interest has also been at the center of virtually all microeconomic models of intertemporal consumer behavior. It is thus curious that empirical studies of the effects of interest rates on saving are few and far between.<sup>1</sup> Most of them conclude that interest rates have only a negligible effect on consumption or saving.<sup>2</sup>

The notion that saving is perfectly interest-inelastic has received widespread acceptance among empirical and policy-oriented macroeconomists. I am presenting considerable evidence below that nothing could be further from the truth; at the same time, it is worthwhile exploring just how important the interest elasticity of the saving rate is in the analysis of a wide variety of vital issues of economic policy. In so doing, I hope to point out how costly it has been (and will continue to be) to accept this conjecture, based on evidence that is flimsy at best and dangerously misleading at worst.

### 2. Some Issues at Stake

Virtually all empirical estimates of tax burdens by income class allocate income taxes according to income: they assume the tax is not shifted.<sup>3</sup> In an economy in which the private saving rate is sensitive to the real after-tax rate of return this assumption is incorrect. Since an income tax decreases the after-tax rate of return on capital, it affects the national saving rate and capital-labor ratio. If saving responds positively to increases in the rate of return, our income taxes, corporate and personal, retard capital accumulation and lead to a lower level of income and the wage/rental ratio than would otherwise exist. In these circumstances, a proportional income tax is quite different from a tax which is borne in proportion to income; indeed, it transfers income from labor to capital, and hence is regressive, relative to such a tax.

A closely related question concerns the differential incidence of an income and a consumption tax. While most economists recognize the efficiency advantages of taxing consumption rather than income, the general argument against the consumption tax has been that it is regressive because it excludes saving from the tax base. This analysis is correct insofar as it goes, for saving is done disproportionately by the wealthy. However, it overlooks two basic points. First, the rate structure may be set differently under a consumption tax; second, the exemption of capital income from the tax base may increase the saving rate, the capital/labor ratio, the productivity of labor, and the wage/rental ratio. This long-run transfer of income from capital to labor must be offset against the short-run gain to capital from the interest income exemption. The net outcome, of course, depends upon the particulars of the two taxes being compared. Again, however, the prevalent view is that "... the differential effect on consumption and saving between an income tax and an equal yield expenditure tax is likely to be small in this country."<sup>4</sup>

Finally, we come to the perennial issue, Are we saving enough in the United States? A variety of economists and politicians have continually expressed concern over the slower rate of real economic growth in the United States than in Japan and Western

(Cont. from p. 4) Eisenberg, William M., "Measuring the Productivity of Nonfinancial Corporations," *Monthly Labor Review* (November 1974), pp. 21-34.; Hultgren, Thor, *Costs, Prices and Profits: Their Cyclical Relations* (New York: National Bureau of Economic Research, 1965); Mitchell, Wesley C., *Business Cycles* (Berkeley: University of California Press, 1913), Chapter 14, and *Business Cycles and Their Causes* (Berkeley: University of California Press, 1941), Chapter 5 (a reprint of Chapter 14 in the 1913 volume); Moore, Geoffrey H., "Productivity, Costs and Prices: New Light from an Old Hypothesis," *Explorations in Economic Research*, Vol. 2, No. 1, (Winter 1975), pp. 1-17.

<sup>1</sup>George F. Break notes: "Unfortunately, empirical evidence on the interest elasticity of the saving rate is rare." See Blinder et al, *Economics of Public Finance*, Brookings, 1975.

<sup>2</sup>A discussion of why these studies may have biased the estimated interest elasticities toward zero is presented below.

<sup>3</sup>For example, see Pechman and Okner, *Who Bears the Tax Burden?*, Brookings, 1974.

<sup>4</sup>J. Pechman, *Federal Tax Policy*, Brookings, 1973.



Europe. Hardly a day goes by when a major speech is not given on "the capital shortage." While the issue is complex and can hardly be dealt with in detail here, suffice it to say that under a not implausible set of assumptions a major component of the answer reduces to this: whether or not current taxes, in driving a wedge between the gross marginal social yield and net marginal private yield on saving and investment, distort the timing of consumption over the life cycle. A sufficient condition for this to occur is a positive interest elasticity of the saving rate.

Thus, if the saving rate displays some interest elasticity, our notions about tax incidence and about intertemporal allocative efficiency will have to be revised drastically.

### 3. Previous Work on Saving Behavior

For several decades econometric work on saving behavior consisted largely in estimating Keynesian-type consumption functions. The inclusion of an interest rate variable in such analyses was the exception rather than the rule. Further, when interest rates were included, nominal before-tax rates rather than real after-tax rates were used. Musgrave and Musgrave report that "studies of the relationship between saving and the rate of interest differ in their conclusion. Some hold that there is a substantial negative relationship, while others attribute little weight to the rate of interest in the consumption function."<sup>5</sup>

In a thought-provoking re-examination of "Denison's Law," David and Scadding document the continued constancy of the gross private saving rate, the constancy of the saving rate augmented to include consumer durable purchases in saving and the rental flow from durables in income, and changes in the composition of private saving between the household and business sectors.<sup>6</sup> They interpret this relative constancy of the gross private saving rate as evidence that taxes — either through a reduction in private income or a reduction in the real net rate of return on capital — do not affect private saving behavior. While this argument also has been made by a large number of other economists, we shall demonstrate below that drawing such behavioral inferences from these data is not warranted.

In brief summary, to date there has been very little empirical evidence from which to infer a positive relationship between saving and the real net rate of return to capital. Surprisingly little attention has been paid to this issue — particularly in light of its key role in answering many important policy questions. The relative constancy of the gross private saving rate in years of full employment — about 16 percent as ordinarily computed and about 23 percent if consumer durables are included — is given an interesting behavioral interpretation by David and Scadding: taxes and present consumption are essentially perfect substitutes; any rise in taxes is offset by an equivalent decline in current consumption.

Four basic points need to be made concerning this conjecture. First, most theories of consumer behavior relate saving to disposable income. If this is correct, aggregate data reveal that the saving rate varies substantially.

Second, it would be surprising indeed if consumers made this type of rational calculation vis-à-vis the government and business sectors in terms of *gross* saving and income. Our economic theories generally relate to how consumers choose their *net* position. Further, except for some possible embodied technical change, it is net saving that is relevant to the issue of whether taxes affect capital accumulation.

Third, even if total gross income and gross saving are examined, there still may be an independent effect of real *net* rates of return on saving. Even if taxes and present consumption are perfect substitutes (the public sector is doing its benefit-cost analyses properly, free-rider issues are ignored, et cetera), the share of private wealth consumed today will depend upon the *net*, or *after-tax*, *return to saving*, whereas gross income is the flow from private wealth at the *gross* return. Hence, taxes decreasing the net return to saving may cause a decrease in saving.

Fourth, the age structure, life expectancy, and retirement patterns in the United States have changed dramatically. The elderly are living longer and retiring earlier, thus implying a substantial increase in the average length of retirement. Combined with the entry of the post-World War II baby boom generation

<sup>5</sup>R. Musgrave and P. Musgrave, *Public Finance in Theory and Practice*, McGraw-Hill, 1974.

<sup>6</sup>P. David and J. Scadding, "Private Saving, Ultra-Rationality and Denison's Law," *Journal of Political Economy*, March-April, 1974, Part 1.

into the labor force and the subsequent decline in the birth rate, we should have witnessed, *ceteris paribus*, an increase in the U.S. saving rate.

Thus, for all these reasons, I find it extremely difficult to give any structural or behavioral interpretation to the constancy of the gross private saving rate.

#### 4. New Estimates of the Effect of Taxes on Saving

I have therefore reexamined the issue of whether taxes — via their effect on the real net return to saving — affect capital accumulation. Using annual aggregate U.S. time series data from 1929 to 1969, I have constructed several alternative measures of the long-run real after-tax rate of return. Inserting these series into a variety of functional forms for the consumption function and employing several advances in econometric techniques, I find a good deal of evidence which suggests that there is a nontrivial, positive relationship between private saving and the rate of return. The equations all performed well by conventional statistical standards. Table 1 catalogs the estimated interest elasticity of saving with respect to the long-run real after-tax rate of return.<sup>7</sup> The estimates cluster around 0.4.

**Table 1**  
**Estimated Real After-Tax Rate of Return**  
**Elasticity of Private Saving**

Specification	Estimated Elasticity
Semi-log function, R1	0.4
Log-linear, R1	0.4
Semi-log, R2 or R3	0.3
Semi-log, postwar only	0.4
N.B. R1 derived from capital income and capital stock series; R2 derived from Moody's Aaa bond yields; R3 derived from Standard and Poor's High-Grade Municipal Bond Yield.	

These results have striking implications for economic policy. The current tax treatment of income from capital — primarily the personal and corporate income taxes, which together impose a tax rate of about 50 percent on income from capital — decreases the net rate of return to capital accumulation enormously. The modest positive real net rate of interest elasticity thus implies a substantial tax-induced decrease in saving and the capital intensity of production, a reallocation of consumption from the future to the present, and a substantial transfer of gross income from labor to capital.

I have estimated<sup>8</sup> that the annual inefficiency — due to the difference between the gross, or social, rate of return on investment and saving and the after-tax return to savers, caused by heavy capital income taxes — is on the order of \$50 billion! This astounding waste of resources is accompanied by a shifting, in the long run, of a substantial share of capital income taxes to labor in the form of decreased future wages. I have estimated that the current system of capital income taxes has reduced the capital-labor ratio in the economy by about 20 percent; these estimates imply that approximately one-half of capital income taxes are ultimately shifted onto labor because of lower productivity due to the decline in capital available per worker.

#### 5. Conclusion

The new evidence suggests that there is a positive relationship between private saving and the rate of return. A variety of definitions of variables, functional forms, and estimation methods all lead to this conclusion. This relationship has immensely important implications for economic policy. Outstanding among these are (1) the astounding loss in welfare due to the distortion of the consumption/saving choice induced by the current tax treatment of income from capital, and (2) that reducing taxes on interest income would, in the long run, raise the level of income and transfer a substantial portion of capital's share of gross income to labor. The overall distributional effects of such a policy combine this long-run effect with that of the exemption of interest income from taxation.

<sup>7</sup>Source: M. Boskin, "Taxation, Saving and the Rate of Interest," NBER Working Paper No. 135; to appear in *Journal of Political Economy*, April 1978.

<sup>8</sup>*Ibid.*

## Specialization, Diversification, and the Allocation of Corporate Resources

(Summarized by Hedy D. Jellinek on the basis of a study by Michael Gort, Henry Grabowski, and Robert McGuckin)<sup>1</sup>

Specialization produces economies and is limited only by the size of the market. What, then, explains the paradoxical trend toward more diversification by large and medium-sized firms, despite the continued growth of our economy and most markets?

The usual explanation — that diversification removes the risk of “putting all one’s eggs into one basket” — is rejected by the authors, who observe that stockholders can avoid this risk by diversifying their portfolios *without* sacrificing the rewards of specialization. Could the reason be, instead, that goals other than maximizing stockholder income are involved?

In looking for answers, the study examines behavior patterns of firms via alternative hypotheses tested by extensive empirical evidence, and compares the relative effects of diversification and specialization on profitability. Two chapters dealing with diversification trends represent, essentially, an updating of Michael Gort’s 1962 book *Diversification and Integration in American Industry*.<sup>2</sup> Despite some differences in samples and periods covered, the current findings are strikingly similar to the earlier ones.

### Some Notes on Methodology

Underlying the overall analysis is the premise that the extent of diversification will depend on expectations regarding returns to capital in different activities. Diversification should increase if expected returns are relatively high in activities where the firm has little or no prior investment; conversely, little change is foreseen if relative returns are high in established major areas of specialization.

Changes in diversification are assumed to occur primarily under the impetus of two factors. These are, first, “push” factors — away from activities with low estimated returns (illustrated by the movement of cigarette firms into new avenues of diversification following the emergence of the health issue in the sixties) — and, second, technological and managerial “pull” factors toward activities with high estimated returns or aggressive growth prospects.

To see what determines changes in diversification, the factors influencing the desired change are analyzed and the actual change itself is related to the desired one. The empirical analysis is structured along the *push* and *pull* hypotheses. Four variables are designed to capture the economic forces at work under the *defensive push motive*, two at the industry level — the industry growth rate in value added and in productivity — and two at the firm level — a firm’s rate of productivity change and its market share. A firm will tend to increase its diversification with (1) unfavorable industrywide trends, (2) an unfavorable individual profitability record (even in an industry of excellent overall prospects), and (3) a large market share.

Turning to the *pull hypothesis*, the authors point out that diversification is triggered not only by pessimistic expectations regarding current activities, but also by optimistic expectations about potential new areas. In this connection, they focus on technological intensity, which they measure via (1) a technical personnel ratio (personnel with scientific or engineering background to all personnel) and (2) an R & D ratio (R & D employees to all employees).

In addition to technological pull, there is also the managerial pull motive: differences in managerial characteristics will have varying effects on the desired levels of diversification. According to the authors, an aggressive managerial pursuit of growth could even reflect a desire for growth for its own sake, regardless of profit expectations.

To measure managerial aggressiveness directed toward diversification, the analysis looks at a firm’s past relative growth performance (growth of a firm’s assets over a prior period relative to a weighted average growth rate of all its operations at the start of that period). While this variable could be taken as an indicator of relative efficiency as well as motivation, both factors are relevant to the process of diversification and therefore to this analysis.

Turning to the relationships between changing levels of diversification and profitability, the authors take into account numerous factors that can alter a firm’s profitability. These include such external factors as fluctuations in demand and changes in factor prices, such mixed factors as changes in the competitive position of a firm vis-à-vis other firms in the industry, and such purely internal factors as advertising, investment, and diversification.<sup>3</sup>

<sup>1</sup>This study is part of the *Studies in the Organization of Markets* described in the June 1977 *Reporter*. Readers interested in the technical details of the analysis and in the data used may obtain a copy of the original paper from Michael Gort.

<sup>2</sup>NBER General Series 77.

<sup>3</sup>In this connection, the model uses the firm’s initial rate of return as a measure of its need to diversify, and makes it interact with its measure of diversification change. In addition, a weighted average of changes in industry profitability is also utilized.

---

## Conclusions

The main findings of Michael Gort's 1962 study mentioned above on the whole still hold good today, despite the differences in samples and time periods covered between the earlier and more recent experience. They include the following:

1. A marked trend toward greater diversity of output of a large fraction of medium-sized and large firms.
2. A significant relationship between size of firm and the number of its activities — but not between size of firm and the proportion of its total output concentrated in the primary activity.
3. Less diversification in firms with a high degree of vertical integration than in others of their size class.
4. A high proportion of diversification initiated by firms based in a limited number of industries.
5. Most frequent diversification by firms based in industries of lower-than-average growth and higher-than-average concentration, characterized also by a higher-than-average ratio of technical to nontechnical employees.
6. Most frequent diversification into industries characterized by high rates of technological change and higher-than-average growth rate.

As to the latest conclusions reached on the determinants of diversification, the empirical results of the new study consistently support the "push" hypothesis, as contrasted to the "pull" hypothesis. This implies that *diversification represents a reallocation of corporate resources when the opportunities to use existing resources in the primary activity are seriously constrained.*

This conclusion is supported by the findings on the relation of profitability to diversification. These indicate that there is no evidence that diversified firms are, on the average, more profitable than specialized firms. In fact, there is some evidence of an inverse relation between level of diversification and returns to shareholders (if returns to shareholders, including capital gains, are measured rather than returns on assets).

On the other hand, *changes* in profitability over a given time period appear to run parallel with changes in diversification once due account is taken of the initial profit rate. The authors interpret this result as follows: (1) diversification moves are, on the average, successful adaptations to adverse circumstances in the firm's primary activities, and (2) firms which act sooner fare better than those that delay reallocation of their resources.

## The National Bureau's Data Bank — The Magnetic Tape Collection

Charlotte Boschan

One of the services the Bureau has traditionally provided to its staff, and to some extent to others, is easy access to both published and unpublished statistical information. In the past, when statistics were distributed in printed form — in books, periodicals, and releases — all that was needed was a "conventional" library with catalogues, reference material, charge-out services, and facilities for interlibrary loans. In the future, when statistical information will presumably be generated, stored and circulated in some kind of computer-readable form, we hope to provide efficient access to that type of information in the best possible form. At the present time technology is in a stage of transition, with the importance of data storage on magnetic tape increasing rapidly — particularly for relatively large data sets — and that of the printed materials diminishing. Our data services reflect this state of the arts: some facilities for using microfiche and microfilm have been made available and organized collections of machine-readable data are being maintained. A review of the magnetic tape collection follows below (the machine-readable time series data bank was described in the last issue of the *Reporter*).

This section of the data bank serves three basic purposes: first, a publication function for the dissemination of Bureau-produced data; second, a library and information function; and third, a true data bank function, eliminating duplication of effort.

In the area of publication, the Bureau-produced data that we make available to everyone are generated by research projects within the Bureau, either as by-products or as end products of research. Our contribution to these data ranges all the way from conducting surveys and creating the data to reorganizing an existing data set. The data bank acts as a distributor, providing the physical tapes appropriate to the user's needs as well as technical and subject matter documentation.

The library function involves cataloguing and referencing data sets, usually for several versions of physi-

cal tapes and various levels of documentation. Interesting new problems have arisen in the process of cataloguing tapes and their associated documentation. In the early days of magnetic data tapes they had no title, no author, no place or date of issue and, above all, no title page summarizing all this information. Since then considerable progress has been made, partly due to the efforts of the Committee on Rules for Cataloguing Machine-Readable Data Files, a subcommittee of the American Library Association.<sup>1</sup> Some rules for citation and classification have been established and producers of tapes now usually try to provide a descriptive title. However, many problems remain unsolved, and data set producers must cooperate by providing unique and descriptive titles as well as short, citable descriptions for their tapes so that, in the future, data files can be catalogued — and retrieved — as routinely as books. We are now preparing a list of all tapes which can be made available to researchers at cost.

The third data bank function eliminates the duplication involved in making tapes usable for researchers other than the original one. It is necessary only because the technology is relatively new and original data tapes are often by-products of administrative or other purposes not related to specific research objectives. They may thus contain inconsistencies, coding errors, incorrect documentation, and unreadable or otherwise faulty information. Researchers who use these data spend much time and energy in "cleaning them up," that is, eliminating or correcting faulty information as well as computing frequencies and cross counts for certain variables. The data bank function is not to clean up tapes but to avoid the duplication of the clean-up operation and to make the clean tapes available for general use. Several university computer centers perform similar services for their user communities, and the National Bureau is a founding member of an overall organization called IASSIST (International Association for Social Science Information Service and Technology), which not only makes clean tapes and documentation available across institutions but also provides standards and guidelines for the production and documentation of data tapes. To the extent that in the long run these guidelines will be actually followed and the standards adhered to, clean-up operations will be performed by the data set producer, making this particular service of the data bank obsolete, except for tapes originating in the Bureau.

## Current NBER Publications

### Liberalization Attempts and Consequences

(An abstract by Anne O. Krueger)

*Liberalization Attempts and Consequences*, Volume X in NBER's Special Conference Series on Foreign Trade Regimes and Economic Development under the direction of Jagdish N. Bhagwati (Massachusetts Institute of Technology) and Anne O. Krueger (University of Minnesota), provides Anne Krueger's analysis of devaluation and liberalization attempts in developing countries. It has three parts: (1) the development of an appropriate framework for analysis of devaluation when it is undertaken in the context of quantitative restrictions on international transactions; (2) an analysis of the devaluation episodes analyzed in detail in the individual country volumes in the National Bureau's project on foreign trade regimes and economic development; and (3) an examination of the relationship between devaluation, liberalization, export earnings, and economic growth.

In the first part, the focus is on the interrelationship between price variables and quantitative restrictions. Concern is first with nominal devaluation, defined as the percentage change in the parity of the currency, and net devaluation, defined as the percentage change in the prices paid and received for a unit of foreign currency. The relationship between net devaluation and domestic price level changes is then examined.

Analysis further centers on the components of a net devaluation which exceeds the underlying rate of inflation. It is shown that there are four distinct phenomena to be analyzed: (1) net devaluation alters the bias of the trade and payments regime between incentives for export and for import-competing production; (2) net devaluation entails diminished reliance upon quantitative restrictions, as premiums on import licenses are absorbed; (3) devaluation reduces the variance in incentives within categories of transactions resulting from the quantitative restrictions set by the regime; and (4) devaluation often results in rationalization of the regime, in that simplification of the quantitative control mechanism may have important real consequences. The major question for the remainder of the book is to evaluate the relative importance of each of the four components. In particular, attention focuses upon the relative importance of

<sup>1</sup>We claim some small part in the progress, since we organized — and participated in — a workshop on Bibliographic Aspect of Documentation as part of a conference on documentation of machine-readable data sets held in New York in April 1974.

liberalization, defined as a shifting from quantitative to price incentives for regulating transactions, and upon bias alteration.

Part two of the book reviews the devaluation experience of the ten countries covered in the Bureau project. It is shown that more than half the attempted devaluations failed because the devaluation was completely eroded by price level changes within very short periods of time. The components of the successful devaluation packages — exchange rate changes, increased flows of imports, debt restructuring, altered monetary and fiscal policy — are then examined. An important conclusion is that many devaluations have failed because policy makers were simultaneously trying to alter the trade regime and reduce the rate of inflation. By selecting a fixed nominal exchange rate, their attempt to alter the trade regime was destined to failure if their attempt to control inflation did not succeed. The importance of a sliding peg policy in successful transitions to alternative trade regimes is underscored.

The final part of Krueger's synthesis volume analyzes the relationship between alternative trade regimes and economic growth. The author concludes that the crucial link probably lies in the nature of the bias of the regime, and ventures a variety of factors which may account for the much more rapid growth rates that appear to result from bias toward exports.

#### RECENT PUBLICATIONS

Bhagwati, Jagdish N., and Anne O. Krueger, eds.,  
*Special Conference Series on Foreign Trade Regimes and Economic Development*

- I. *Turkey*, by Anne O. Krueger                      cloth \$17.50  
   paper \$5.00
- II. *Ghana*, by J. Clark Leith                              \$15.00
- III. *Israel*, by Michael Michaely                        \$12.50
- IV. *Egypt*, by Bent Hansen and Karim  
      Nashashibi    \$17.50
- V. *The Philippines*, by Robert E. Baldwin            \$10.00
- VI. *India*, by Jagdish N. Bhagwati and  
      T. N. Srinivasan                                      cloth \$15.00  
   paper \$5.00
- VII. *South Korea*, by Charles R. Frank, Jr., Kwang  
      Suk Kim, and Larry Westphal                    \$15.00
- VIII. *Chile*, by Jere R. Behrman                        \$17.50
- IX. *Colombia*, by Carlos F. Díaz-Alejandro           \$15.00

Dresch, Stephen P., An-loh-Lin, and David K. Stout,  
*Substituting a Value-Added Tax for the Corporate Income  
Tax: First-Round Analysis*                              \$16.50

Kendrick, John W., *The Formation and Stocks of Total  
Capital*    \$15.00

Landes, William, ed., "Economic Analysis of Political  
Behavior" in *The Journal of Law and Economics*, December  
1975    \$5.00

Rosett, Richard N., ed., *The Role of Health Insurance in the  
Health Services Sector*                                \$17.50

Terleckyj, Nestor, ed., *Household Production and  
Consumption*    \$20.00

*Annals of Economic and Social Measurement*, Volume 6,  
Number 3, *Special Issue on Control Theory Application II*  
Tse, Edison, David Kendrick and Peggy Mills, eds.

Conrad, William E., "Imperfect Observation and  
Systematic Policy Error"

Morf, M. and T. Kailath, "Recent Results in Least-  
Square Estimation Theory"

Palash, Carl J., "On the Specification of Unemploy-  
ment and Inflation in the Objective Function"

Sant, Donald T., "Generalized Least Squares  
Applied to Time Varying Parameter Models"

Siljak, D.D., "On Stochastic Stability of Competi-  
tive Equilibrium"

Sworder, D.D., "Low Profile Economic Policy with  
Guaranteed Return"

*Explorations in Economic Research*, Volume 4, Number 1,  
*Indexation, the Brazilian Experience*, Nadiri, M. Ishaq,  
and Affonso C. Pastore, eds.

Pastore, Affonso, C., Almonacid, Ruben D., de  
Barros, Jose Roberto M., "Reflection on the  
Brazilian Experience with Indexation"

Lemgruber, Antonio Carlos, "An Analysis of Fried-  
man's Hypotheses on Monetary Correction"

Morley, Samuel A., "Indexing and the Fight  
Against Inflation"

Fendt, Jr., Roberto, "Indexation: Optimality Condi-  
tions for Revenue from Inflation and Social  
Gain"

da Silva, Adroaldo Moura, "The Basis of the Mini-  
devaluation Policy"

Macedo, Roberto, B.M., "A Critical Review of the  
Relation between the Post-1964 Wage Policy  
and the Worsening of Brazil's Size Income Dis-  
tribution in the Sixties"

Kleiman, Ephraim, "Monetary Correction and  
Indexation: The Brazilian and Israeli Experience"

Patinkin, Don, "What Advanced Countries Can  
Learn from the Experience with Indexation:  
Some Concluding Observations"

# FORTHCOMING BOOKS AND JOURNAL ARTICLES

Bhagwati, Jagdish N., and Anne O. Krueger, eds.,  
*Special Conference Series on Foreign Trade Regimes and Eco-  
nomic Development*

X. *Liberalization Attempts and Consequences*  
by Anne O. Krueger

XI. *Anatomy and Consequences of Exchange Control  
Regimes* by Jagdish N. Bhagwati

Boskin, Michael, ed., "Conference on Research in  
Taxation," Supplement, *Journal of Political Economy*  
(forthcoming)

Eisner, Robert, *Factors of Business Investment*

X Froomkin, Joseph N., Dean T. Jamison, and Roy  
Radner, eds., *Education as an Industry* \$20.00

Garvy, George, *Money, Financial Flows, and Credit in the  
Soviet Union*

Ingram, Gregory K., ed., *Residential Location and Urban  
Housing Markets*

Juster, F. Thomas, ed., *The Distribution of Economic Well-  
Being*

Popkin, Joel, ed., *Analysis of Inflation: 1965-1974*  
\$20.00

*Annals of Economic and Social Measurement*, Volume 6,  
Number 4:

Hause, John, "The Covariance Structure of Earn-  
ings and the On-the-Job Training Hypothesis"

Houser, Robert, "Models of Railroad Passenger-  
Car Requirements in the Northeast Corridor:  
An Application of SESAME"

MacRae, Elizabeth Chase, "Optimal Experimental  
Design for Dynamic Econometric Models"

Ruggles, Nancy, and Richard Ruggles and Edward  
Wolff, "Merging Microdata Rationale, Practice  
and Testing"

Friedman, Benjamin M., and Vance Roley, "Iden-  
tifying Identical Distributed Lag Structures by  
the Use of Prior Sum Constraints"

*Explorations in Economic Research*, Volume 4, Number 2:

Smith, James P., "Family Labor Supply over the  
Life Cycle"

Piper, Thomas R. and Jasper H. Arnold III,  
"Warrants and Convertible Debt as Financing  
Vehicles in the Private Placement Market"

Coate, Douglas, "The Market for Optometric Ser-  
vices in the United States in the 1960s"; "The  
Optimal Employment of Inputs in Fee-for-  
Service, for-Profit Health Practices: The Case of  
Optometrists"

Use this form to obtain the National Bureau publications described in this issue. The Bureau also offers annual subscription plans for books and journals through which you can obtain publications in advance and at a substantial discount. Further information is available on request.

PLEASE SEND THE NATIONAL BUREAU PUBLICATIONS LISTED BELOW:

no. copies	author	title	price
_____	_____	_____	\$ _____
_____	_____	_____	_____
_____	_____	_____	_____
total			\$ _____

Name \_\_\_\_\_

Address \_\_\_\_\_

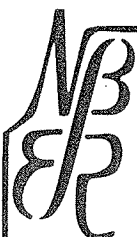
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Postage will be paid on all prepaid orders.  
Payments must be in U.S. funds drawn on  
U.S. banks.

**National Bureau Reporter** 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 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 impartial 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, business associations, and various government agencies, 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.

**National Bureau Reporter**, edited by Hedy D. Jellinek, is issued several times a year by the National Bureau of Economic Research, Inc., 261 Madison Avenue, New York, New York 10016; telephone (212) 682-3190. It is distributed without charge to National Bureau contributors, subscribers, and others interested in the field of economic research. Inquiries may be addressed to Publications Department.



National Bureau of Economic Research  
261 Madison Avenue  
New York, N.Y. 10016

Non-Profit Org.  
U.S. Postage Paid  
Permit #93  
New Haven, Conn.