

REPORTER

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

DECEMBER 1977

Editorial Message

Interaction — this is our watchword at the National Bureau. Interaction in economic research within a framework that permits achievements individuals could attain neither alone nor through other organizations is NBER's unique contribution. This interaction, stressed by the Bureau's president, Martin S. Feldstein, in this year's *Annual Report*, is also the theme running through the December *Reporter*.

Take the three NBER personalities, for example, whom we portray in this issue. Contact between individual academic researchers and the business and labor sectors is normally not as close or frequent as might be desirable for fruitful research and policymaking. Here, however, we see three outstanding representatives of the National Bureau who come from these somewhat different worlds and thereby help enrich the broad base of the Bureau's work, as well as their own and that of the wider community. And that community is wide, as illustrated by the impact of NBER research on European scholarship (see "Human Behaviorists" in Paris).

Or take some of the articles: "Inflation and Profits," "The Rising Divorce Rate," "Family Migration Decisions" — the titles themselves imply the wide scope of research findings available for spreading the benefits of interaction. The latter two are particularly good examples of interaction at work, since they are related while emanating from two independent NBER projects, one conducted in New York, the other in California.

Note also the array of research topics revealed in the list of NBER working papers (some of which are summarized), a new regular feature of the *Reporter*. Disseminating current research results via working papers and summarized research reports should prove of considerable benefit to the research community at large — another facet of interaction. Reader comment is cordially invited on this as well as any other feature of the *Reporter*.

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Current NBER Conferences

This year's meeting of NBER's Conference on Research in Income and Wealth took place in Williamsburg, Virginia, on December 8 and 9. Entitled "Modeling the Distribution and Intergenerational Transmission of Wealth," it represents an outstanding forum for exchanging ideas and findings in the growing research on measuring the size distribution and intergenerational flow of the nation's wealth.

The following topics were on the agenda: "Three Centuries of American Wealth Inequality Trends" (J.G. Williamson, Wisconsin and P. Lindert, California, Davis); "Changing Patterns of Inheritance" (W. H. Newell, Miami); "Wealth Distribution in Tennessee" (W. H. Perry, Tennessee); "Estimates of the 1969 Size Distribution of Household Wealth in the U.S. from a Synthetic Data Base" (E. Wolff, NYU and NBER); "Social Security Taxation and Wealth Accumulation" (N. D. McClung, U.S. Treasury); "Wealth between Generations" (M. P. Allen, Washington State); "Intergenerational Wealth Transmission" (P. Menchik, Wisconsin); "The Bequest Process: A Simulation Analysis for Canada" (M. Wolfson, Ottawa, Treasury Board); and "Simulating Intergenerational Wealth Transmission" (G. H. Orcutt, Yale).

NOTE: A conference on public regulation, sponsored by the National Bureau under a grant from the National Science Foundation, was held December 15-17 in Arlington, Va. Look for a discussion of its proceedings in your March *Reporter*.

NBER Personalities



David L. Grove

NBER's motto of interaction in economic research could hardly have a more enthusiastic standardbearer than David L. Grove, corporate vice president and chief economist of IBM. One of the reasons he values his membership on the National Bureau's Board of Directors very highly is that it enables him personally to be in contact with outstanding academic economists, labor economists, and other business economists.

Another is that he considers the Bureau's contribution to the economic well-being of the nation enormous. "To paraphrase — and invert — a famous quotation about another firm," he said recently, "What is good for the economy is good for IBM, and the National Bureau provides the facts our government needs to make the policy decisions necessary for a well-run economy." In his view, the Bureau's unique function lies in amassing and analyzing the "raw materials" and "intermediate goods" on which the rest of the economics profession depends. He also applauds the pioneering done by NBER in various far-flung areas of economic research.

This is not surprising: a broad perspective is a highly-prized commodity to David Grove. He himself has gained it over a brilliant career in central banking, commercial banking, and the IBM world of technology. Armed with Harvard degrees in public administration as well as economics (AB, 1940; MPA and MA, 1942; Ph.D., 1952), he joined the Federal Reserve Board (after a wartime stint with the Office of Strategic Services) in 1944 as an economist. Later he became chief of the Latin American section, and eventually, economist in the banking section. In 1952 he switched to the Bank of America in San Francisco, where he worked variously as chief economist, vice president, head of the international relations department, and finally, head of the bond investment department. In 1965, after a year at the Federal Reserve Bank of San Francisco, he came to New York (as vice president and economist of Blyth and Co., Inc.), and joined the IBM Cor-

poration in 1966. As chief economist and corporate vice president, he is responsible for advising IBM's management on economic matters, supervising the research staff, and representing the company in external economic affairs, nationally and internationally.

Throughout the years, Dr. Grove has traveled extensively in Latin America, Europe, the Far East, and the Middle East. He served as adviser to central banks on banking, credit, and foreign exchange policy in Paraguay (1944, 1951), Guatemala (1944-1945, 1957, 1963), Ecuador (1947, 1956), the Philippines (1948, 1949), Chile (1950), Colombia (1950), and Israel (1964), and, more recently, has made many special trips abroad to observe economic conditions, participate in conferences, and handle special assignments.

World travel has brought, among other things, an unusual by-product to David Grove, who shares Nero Wolfe's legendary passion for orchids: it has provided him with the opportunity to inspect orchids and orchid growers in their native habitat. At home, where he pursues his hobby via the Greater New York and the American Orchid Societies, he raises orchids in his own greenhouses.

As to his other extracurricular activities, it goes without saying that he has served on many a board of directors and trustees and on government advisory groups. Currently he is also a member of *Time Magazine's* board of economists and an Associate Editor of the *Financial Analysts Journal*.

On a more personal level, Dr. Grove is married to the former C. Lois Pawlowski. The couple live in Armonk, N.Y., and have a married daughter, Carolyn Anne.



Robert Solow

Once, at an Income and Wealth Conference where Robert Solow appeared on the platform with Paul H. Douglas, the senator gave him a copy of his famous *Theory of Wages* with the following inscription: "To Robert Solow, who continues to carry the torch." This is as good a capsule portrait as any of the man who is the new president of the American

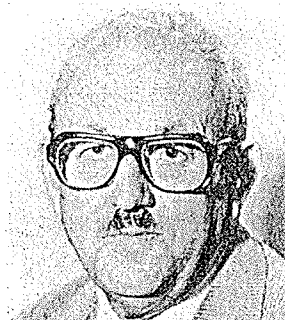
Economic Association, Institute Professor of the Massachusetts Institute of Technology, and member of NBER's Board of Directors and Executive Committee.

An outstanding mathematical economic theorist, he specializes in the areas of capital and economic growth, macroeconomics generally, the theory of land use, and the economics of exhaustible resources. His academic accomplishments are legion. In addition to his Harvard Ph.D. (David A. Wells Prize, 1951), he has amassed honorary degrees from the University of Chicago (LLD, 1967), Brown University (LLD, 1972), Williams (D. Litt., 1974), the University of Paris (Dr. honoris causa, 1975), and Lehigh (LLD, 1977). When not teaching at M.I.T., he is busy lecturing at outstanding institutions abroad — Cambridge (Marshall Lecturer, 1963), Rotterdam (DeVries Lecturer, 1963), Stockholm (Wicksell Lecturer, 1964), the Royal Society, London (Nuffield Lecturer, 1965), Oxford (George Eastman Visiting Professor and Fellow at Balliol, 1968-69), Warwick University (Radcliffe Lecturer, 1969), and Manchester (Special Lecturer, 1970).

Although one wonders how he has found the time, Robert Solow has also managed to write more than fifty papers for professional journals, as well as several books and chapters in conference volumes. Some of his recent publications — a full list would be far too long for inclusion here — includes *Price Expectations and the Behavior of the Price Level* (1970), "The Economics of Resources and the Resources of Economics" (*American Economic Review, Proceedings*, 1974), and "Some Lessons of the 1960's" (*The Great Society*, 1974).

As is frequently the case with NBER personalities, he has made his professional expertise available to the government and other organizations. A Senior Economist (1961-62) and consultant (1962-68) on the Council of Economic Advisers, he was appointed by President Johnson to the National Commission on Technology, Automation, and Economic Progress (1964) and the Commission of Income Maintenance Programs (1968). Since 1975, he has served as Director and Deputy Board Chairman of the Federal Reserve Bank of Boston, and Vice Chairman of the Board of Directors of the Manpower Demonstration Research Corporation. He is also a member of the Brookings Panel on Economic Activity and of the Scientific Advisory Committee of the Sierra Club, a trustee of the Princeton Institute for Advanced Study, a fellow of the American Academy of Arts and Sciences, and a council member of the National Academy of Sciences.

Last, but not least, Robert Solow is also a family man. He and his wife, Barbara, have three children — John Lewis, Andrew Robert, and Katherine — and make their home in Boston.



Lazare Teper

Lazare Teper is a pragmatist, who favors an institutional approach to economics rather than theoretical modelbuilding. According to his credo, economic research should be, as he puts it, "an analysis of the theoretical underpinnings by empirical inquiry."

His pragmatic approach evolved via an early scientific training and later practical experience in industry and government. As a teen-age Russian emigré living in Paris in the mid-1920s, he studied mathematics at the Université Populaire Russe and the Université de Paris. After arriving in the United States in 1927 he attended Johns Hopkins, doing postgraduate work in physics before transferring later to its department of political economy. He received his MA in 1930 and his Ph.D. in 1931; his dissertation dealt with hours of labor. Following graduation, he was employed as a Research Assistant at Johns Hopkins in its Walter Hines Page School of International Relations (designed at that time to serve as a postgraduate school for the U.S. Department of State), where he worked on the repudiation of Russian foreign indebtedness by the Soviet government. When the Page School ran out of funds, most of its staff had to seek other employment. After a brief stint teaching economics at Brookwood (from 1934 to 1936) Lazare Teper took a position as Director of Research of the Joint Board of the Dressmakers' Union, an affiliate of the International Ladies' Garment Workers' Union, and two years later an identical position at the general office of the ILGWU. This has been the center of his operations ever since.

The research under his direction lies in the field of industrial economics, with special emphasis on the garment industry. Overall economic trends and their effects on the various facets of the industry are

analyzed. The findings are used in connection with the union's collective bargaining activities and to assist policy makers. Among the various publications of the department headed by Lazare Teper is the periodic report *Conditions in the Women's Garment Industry*. Material prepared under his direction is also used in presentations to various legislative and administrative government bodies, ranging from problems in measuring consumer prices to the impact of international trade on the various branches of the apparel industry.

His work for the government goes back to the late 1930s, when he was a consultant to the Social Security Board and the N.Y. Department of Labor. Over the years (after wartime military service) his contributions to various government agencies, Federal and local, have been too numerous to mention. Currently, for example, his reports are used by various government departments in connection with the forthcoming multinational trade negotiations (the so-called Tokyo round) now pending in Geneva.

At the National Bureau he has served as Director at Large since 1970. His pragmatic approach and broad experience in industry and government have made a valuable contribution to NBER's Board, whose responsibility it is to carry out the Bureau's stated objective — "to ascertain and to present to the public important economic facts and their interpretation in a scientific and impartial manner."

On a more informal level, Lazare Teper's interests include, among other things, photography and music, where he is an active practitioner. He plays the organ, which he, typically, considers "the statistician's instrument" because of the great variety of permutations it permits.

"Human Behaviorists" in Paris

The impact of NBER research on the international economic scene — interaction abroad — was highlighted at a recent international conference on sociological economics held in Paris. Gary S. Becker, policy advisor of the National Bureau's Center for Economic Analysis of Human Behavior and Social Institutions, presented the lead paper at the conference, which had been organized with a focus on the research brought to global attention by the pioneering work of Becker and other members of NBER's "Human Behavior Center."

The Center is designed to increase understanding of the individual's behavior and of the functioning of institutions such as hospitals, courts, and schools, with a view to improving health and knowledge and reducing poverty and crime. Its research deals primarily with the analysis of intangible wealth of society and applies the tools of economic analysis of production and distribution theory to aspects of human behavior for which no formal markets exist. This is in line with the Bureau's long-standing objective: to provide better quantitative measures of the economic performance of society.

Becker's paper argues that the economic approach provides a valuable unified framework for studying all aspects of human behavior. According to Dr. Becker, University Professor at the University of Chicago, this approach encompasses three fundamental assumptions: maximizing behavior, market equilibrium, and stable preferences.

Other NBER personalities participating at the Paris conference were Robert T. Michael (see "The Rising Divorce Rate" below) and Reuben Gronau (Hebrew University, Jerusalem). The conference papers will be published in France (in English), in a volume edited by Professor L. Lévy-Garboua entitled *Sociological Economics*.

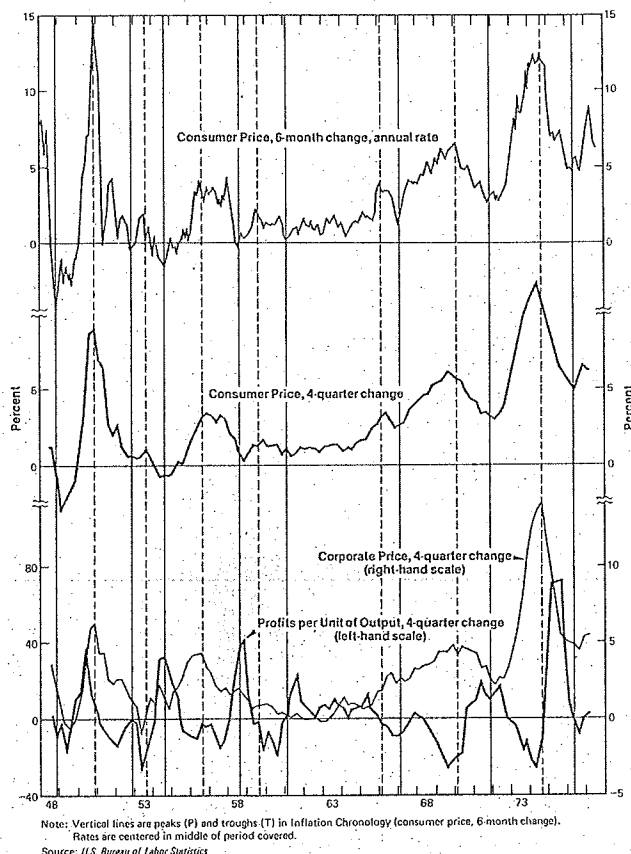
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Inflation and Profits

Geoffrey H. Moore

Does a high rate of inflation improve the profit situation of business enterprises? Or, to put it the other way around, do rising profits contribute to inflation? Although the experience of individual industries will differ, the record for business enterprise as a whole suggests that the answer to both these questions is no. Indeed, profit margins during the past twenty years have, on balance, acted more as an offsetting than as an intensifying factor with respect to inflation. Profit margins were higher, on the whole, when the rate of inflation was low and lower when the rate of inflation was high.

Chart 1
Prices and Profits per Unit of Output:
Rates of Change, 1948-1977



The record since 1948 is in Chart 1, based upon figures published by the Bureau of Labor Statistics. The top line in the chart shows the rate of change in the consumer price index during successive six-month intervals, after adjustment for seasonal variation. This is the basis for the monthly chronology of the rate of inflation, marked off by vertical lines representing peak rates and trough rates.¹ The

next line is the rate of change in the CPI over four-quarter intervals. Both rates are centered in the middle of the interval to which they pertain, and on this basis they show similar movements, although the quarterly series is smoother. The next pair of lines pertain to the rates of change in prices and in profits per unit of output for all nonfinancial corporations, also expressed as rates of change over four-quarter intervals. Corporate prices, it will be seen, are closely related to consumer prices. The consumer, by and large, pays what the corporations charge.²

During the Korean War period and for several years thereafter, the rates of change in corporate profits per unit of output were, on the whole, positively related to the rates of change in corporate prices. But since 1955 or so an inverse tendency has developed. In 1972, for example, when corporate prices were rising at a modest 3 percent annual rate, profits per unit of output rose at an 18 percent clip. By 1974, when the rate of increase in corporate prices reached 13 percent, unit profits were *falling* at a 29 percent annual rate. In the following year, when the inflation rate dropped to 8 percent, profits per unit of output rose at a phenomenal 67 percent rate.

Table 1 shows the rates of change in unit profits when corporate prices were rising most rapidly and when they were rising least rapidly or falling. The first swing in prices, 1949 to 1951 to 1953, was accompanied by a similar swing in unit profits. Since then, profits have swung in the opposite direction to prices, declining when prices were rising most rapidly, rising when prices were rising least rapidly. In general, the fluctuations in profits, both up and down, are far wider than in prices: the scale for profits in Chart 1 is eight times as large as the scale for prices. The profit line and the price line have not always moved in the opposite direction by any means, but in recent years the tendency has been that way. High rates of inflation have not been good for profits.³

¹See *NBER Reporter*, June 1977, for a discussion of this chronology.

²This is not strictly correct. For one thing, many things that corporations sell are not sold to consumers. They may sell machinery to other corporations, to the government, or to buyers in other countries, for example. Also, consumers buy some products or services from noncorporate sources. But the prices paid by consumers, overall, are very closely correlated with the prices received by corporations. The correlation coefficient (r), 1948-77, based upon four-quarter changes, is +.90.

³The correlation coefficients (r) between the four-quarter changes in corporate prices and unit profits are: 1948-54, +.40; 1955-77, -.07. Neither of these coefficients are statistically significant, which means that by this test the data do not refute the hypothesis that there is no relation between the rates of change in unit profits and prices. It is clear, however, that since 1955 the relation has not been positive. It should be noted that because both the unit profits and the price (implicit price deflator) indexes are obtained by dividing dollar aggregates by an index of output, errors in the latter tend to produce a spurious *positive* correlation between unit profits and prices, in which case an observed inverse correlation would be understated. (Cf. footnote 4 below.)

Table 1
Corporate Prices, Consumer Prices, and Unit Profits, 1949-77

Dates of High and Low Rates of Change in Corporate Prices		Rates of Change (%) in					
		Corporate Prices		Consumer Prices		Unit Profits	
High (1)	Low (2)	At High (3)	At Low (4)	At High (5)	At Low (6)	At High (7)	At Low (8)
	1/49-1/50		-0.7		-1.5		-4.4
2/50-2/51		6.3		9.2		7.3	
	4/52-4/53		-0.9		0.8		-26.2
1/56-1/57		4.4		3.4		-1.8	
	3/62-3/63		-0.1		1.4		7.4
2/69-2/70		4.9		6.1		-21.9	
	3/71-3/72		2.3		3.1		12.4
1/74-1/75		14.6		11.1		-18.0	
	1/76-1/77		4.6		5.9		-8.3

Note: The corporate price figures are based upon the implicit price deflator for gross domestic product of all nonfinancial corporations. Unit profits are corporate profits before taxes but with inventory valuation and capital consumption adjustments, per unit of gross domestic product of non-financial corporate business. All percent changes are computed from same quarter year ago, for the intervals in cols. 1 and 2.

Source: U.S. Bureau of Labor Statistics.

In view of the close relation, mentioned above, between corporate prices and consumer prices, the relations between corporate profits and corporate prices carry over to consumer prices (see Table 1). That is, the highest rates of increase in consumer prices have been associated in recent years with low rates of increase (or a decline) in corporate profits per unit of output, and vice versa.⁴

How does this come about? To make sense of it one has to look at the behavior of costs of production, and at the changing relationship between costs and prices during the course of the business cycle. The September issue of the *NBER Reporter* demonstrated that costs and prices in the economy as a whole have a peculiar, yet characteristic, relationship during the business cycle. During a business

expansion the rate of increase in prices generally rises and so does the rate of increase in costs — labor costs as well as other costs. But the cost curve rises faster. Whereas at the beginning of an expansion prices are typically rising faster than costs, at the end costs are typically rising faster than prices. Somewhere around the middle of an expansion costs per unit of output rise at about the same rate as prices, but from there on costs rise faster than prices, putting a squeeze on profits even though prices may still be rising faster than before. The upshot is that the rates of change in profits per unit of output are rising less rapidly, or even declining, at the end of a business expansion — the peak of prosperity — than at the beginning, even though prices are rising faster at the end than at the beginning.

⁴The correlation coefficients (*r*) between the four-quarter changes in consumer prices and unit profits are: 1948-54, +.26; 1955-77, -.15. Since the CPI is statistically independent of unit profits, the influence of spurious positive correlation is not present in these coefficients (cf. footnote 3), which may explain why the positive coefficient before 1955 is smaller and the negative coefficient after 1955 is larger than when the corporate price series is used. Neither of them, however, refute the hypothesis that the true correlation is zero.

In this sense, prices do not keep up with costs during the late-expansion phase of the cycle, and profits are the victim. During a recession, on the other hand, the stage gets set for a recovery in profits, because the reduction (or reduced rate of increase) in costs is larger than the reduction (or reduced rate of increase) in prices. The recovery in unit profits usually starts during the recession but becomes dramatic during the first year or so of the ensuing business upswing. Meanwhile the rate of inflation recedes. Hence profit margins tend to be restored even though prices are rising less rapidly than before. Profits appear to be the beneficiary of a reduction in the rate of inflation.

I say "appear to be the beneficiary" because what I have been describing is simply the way things work out during the course of a business cycle, with prices, costs and profits all acting and reacting upon one another, influencing and being influenced by other variables as well. The profit squeeze stimulates efforts to reduce costs, but the effort may be so "successful" that a recession results. Prices may be forced down by the reduced demand that the recession brings. Higher profit margins and lower prices may be the joint result of this process, but the one is not the result of the other. Nonetheless, the record makes clear that a lower rate of inflation is not incompatible with an improvement in margins.

Why has the relationship between prices and unit profits become more nearly inverse in recent years than formerly? The encroachment of costs on prices during a business cycle expansion, and its reversal during a recession, has been a long-standing phenomenon. Indeed, it was described by Wesley Mitchell in 1913, in his classic volume on business cycles. But the relation of prices to the business cycle has changed in recent years. The rate of inflation has reacted to recession more sluggishly, so the highest rates have come closer to or even after the peak of the cycle, when profit rates have been moving down for some time. Costs of production have moved more sluggishly in this sense also, and help to account for the change in the behavior of prices.⁵ The upshot is that high rates of inflation have corresponded more closely with low points in the rate of change in profits per unit of output, and low rates of inflation more closely with high points in the rate of change in unit profits.

NBER Research Summaries

The Rising Divorce Rate

Robert T. Michael

The author (NBER and Stanford University), together with Gary S. Becker, is directing a major research project within NBER's Center for Economic Analysis of Human Behavior and Social Institutions on change and stability in the American family. The following summary focuses on the portion of that project dealing with the determinants of divorce.

Introduction

The past three decades have witnessed many unprecedented changes in the American family. For example, the "baby boom" of the 1950s was followed by the lowest birth rates in U.S. history; the labor participation rates of married women with young children has tripled; correspondingly, the share of family income earned by women has risen substantially; the number of single-person households increased nearly four times as rapidly as the total number of households between 1950 and 1970; and, within the past decade, the divorce rate doubled.

Many of these changes will have important effects on traditional economic concerns — spending patterns, savings behavior, taxes and social transfer payments, measured distribution of income, et cetera. Consequently, to explore both the causes and the consequences of some of these recent social developments, the National Bureau launched a major research project about a year ago on change and stability in the American family, currently supported by grants from the Alfred P. Sloan Foundation and the Lilly Endowment. The analysis of the rising divorce rate forms an important part of that project.

Our research on the determinants of divorce has proceeded within an analytical framework useful for studying divorce behavior both at a point in time and over time. Cross-sectional differences in divorce behavior are investigated with two dissimilar data sets reflecting behavior of couples over the period from the 1930s through the late 1960s. Our time series studies use annual data on U.S. divorce rates since 1920. While there is still work to be done

⁵See Geoffrey H. Moore, "An Inflation Chronology," *NBER Reporter*, June 1977, p. 7; "Lessons of the 1973-1976 Recession and Recovery," in *Contemporary Economic Problems, 1977* (William Fellner, editor), American Enterprise Institute, 1977, pp. 154-6. Philip Cagan reached a similar conclusion regarding the reaction of wholesale prices to business cycles in "Changes in the Recession Behavior of Wholesale Prices in the 1920's and Post-World War II," *Explorations in Economic Research*, Vol. 2, No. 1, Winter 1975, pp. 54-104.

in reconciling the time series with cross-sectional results, our research has already yielded many significant new conclusions in addition to confirming several sociological findings (such as the negative relationship between age at marriage and likelihood of divorce, for example).¹

The Impact of Men's Income

One of our most interesting cross-sectional findings concerns the relationship between a husband's income and the likelihood of divorce: men with *relatively low* incomes are much more likely to divorce, but men whose incomes are *exceptionally high* are also somewhat more likely to divorce than those with average levels of income.

This U-shaped relationship, which emerges when several other factors, including duration of marriage and age at marriage, are held constant, is best understood by considering marriage as similar to any other long-term contract. The parties involved in the contract have sought out what seems to them at the time of marriage to be the best deal they can make. They are constrained in their selection of a mate by their own limited set of attributes through competition with others. Although they choose to marry after some searching, their decisions are made with less than perfect or complete information about their prospective spouse, about the alternatives available, even about themselves and what they might prefer in the future. Since there are benefits from marriage, there are opportunity costs to not marrying, just as there are costs to marrying someone whom one may later wish to divorce. (The best evidence that there are substantial benefits is that the overwhelming majority of men and women do, in fact, marry — well over 90 percent by one recent estimate.)

The benefits or gains from being married, using economic theory of production, are shown to be greater the higher the level of the primary earner's income. Thus, men with higher lifetime incomes have a greater incentive to marry, to remain married, and, if divorced, to remarry. This explains the generally negative relationship between men's income level and the likelihood of divorce, and is confirmed by our empirical evidence that the higher the level of the man's income the greater the probability that he will remarry if divorced and the lower the likelihood that he will divorce again. The

upturn in the likelihood of divorce for men with the exceptionally high levels of income is explained by the fact that at the time of marriage these men (and their spouses) probably did not accurately predict the level of income that would be achieved — the marriage contract was entered into on the basis of an income expectation that turned out to be incorrect. The unexpectedly high income implies that the marriage partnership was probably less appropriate than the couple originally thought. Thus, the likelihood of divorce is relatively high for these couples.

The Impact of Unexpected Events

The effect of unexpectedly high income on the marriage partnership described above can be generalized: any unexpected event appears to be, on balance, maritally destabilizing. When we looked at the impact of the income of men on divorce, we attempted to identify an anticipated income level of each man and an unanticipated residual income (either positive or negative). The anticipated income had a negative relationship with divorce as expected; the unanticipated income raised the likelihood of divorce. Moreover, both positive and negative unanticipated income raised the likelihood of divorce — whether he made more or less than expected was not as important as the fact that he earned an income which was not the one on which the marriage contract had been based. If he earned less than expected, presumably she felt she could do better in the marriage market; if he earned more than expected, presumably he felt he could do better. Both events increased the likelihood of divorce. Of course, our interpretation of the U-shaped relationship of husband's income and the probability of divorce is only one explanation; empirical findings are generally subject to many interpretations. But we have found considerable evidence that unexpected events — long periods of unemployment, subfecundity, improvements or deterioration in health status, as well as very high and very low levels of men's income — are associated with relatively high rates of marital instability.

One interesting implication of this finding pertains to recent results from the various negative income tax (NIT) social experiments. Studies from these experiments in New Jersey and, more recently, Denver and Seattle have found that income mainte-

¹See Gary S. Becker, Elizabeth M. Landes, and Robert T. Michael, "An Economic Analysis of Marital Instability," *Journal of Political Economy* 85, No. 6 (December 1977) and NBER Working Paper 153; and Robert T. Michael, "Determinants of Divorce" in *Sociological Economics* (forthcoming) and NBER Working Paper 147; "Why Has the U.S. Divorce Rate Doubled within the Decade?" and "Anatomy of the Divorce Rate: 1960-1974," NBER Working Paper 202; and "Causation Among Socioeconomic Time Series," mimeo, October 1977.

Table 1
Estimated Marginal Effect of Each Child on the Five-Year Probability of Divorce,
for White Women, by Age of Child

Number	5th to 10th Year of Marriage (child under 6)	10th to 15th Year of Marriage	
		(child under 6)	(child 6-17)
1	-2.0%	-1.7%	-0.3%
2	-1.2	-0.9	+0.4
3	-0.4	-0.2	+1.2
4	+0.4	+0.5	—
Five-Year Probability of Divorce:			
With no children:	6.0	5.8	
With average number of children:	3.9	3.6	

Source: Becker, Landes, Michael, Table 3; the last two columns are computed assuming the mean number of the other-aged children.

nance raises the rate of marital dissolution.² One reason may be that the experiment itself was not anticipated at the time of marriage and thus represented an unexpected event which was maritally destabilizing. We might expect a similar one-time effect from an actual national NIT program if one is ever introduced.

The Impact of Children

Another interesting finding in our cross-sectional study pertains to the impact of children on the likelihood of divorce. Contrary to previous demographic studies which failed to observe any systematic effect, our estimates of the five-year probability of divorce for five thousand white women show that the number and ages of children present in the family at specific lengths of marriage have sizable effects on the probability of divorce in the subsequent five years.

The accompanying table indicates the implied impact on the five-year probability of divorce exerted by each of the first four young children (under age 6) and older children (age 6-17) for two durations of marriage. The presence of young chil-

dren considerably lowers the likelihood of divorce — having two young children by the fifth anniversary of marriage, for example, is associated with the probability of divorce within the next five years of 2.8 percent compared to 6.0 percent if there are no children by the fifth anniversary.³ Additional young children beyond two at any point in time appear to have a far lower marginal impact on the likelihood of divorce. Likewise, the presence of older children (age 6-17) does not appear to have the same deterrent effect.

The rather complicated relationship observed among number and ages of children, duration of marriage, and the likelihood of divorce probably explains why several other studies have failed to observe the simple, linear time-invariant relationship between number of children and the likelihood of divorce. We have found not only that a highly significant relationship exists with first-marriage divorce rates, but also that the presence of children is an important influence on the likelihood of remarriage for divorced women (who generally retain child custody), and can explain, we think, most of the observed difference between men and women in the probabilities of remarriage.⁴ While

²See Isabel Sawhill, Gerald E. Peabody, Carol A. Jones, and Steven B. Caldwell, *Income Transfers and Family Structure* (Washington, D.C.: The Urban Institute, 1975); and Nancy B. Tuma, Lyle P. Groeneveld, and Michael Hannan, "First Dissolutions and Marriages: Impacts in 24 Months of the Seattle and Denver Income Maintenance Experiments," Center for the Study of Welfare Policy, Stanford Research Institute, Research Memorandum 35, August 1976.

³The table shows the marginal effect of the child, so two young children by the fifth anniversary lower the probability of divorce by 2.0 + 1.2 percentage points from 6.0.

⁴In the Survey of Economic Opportunity data about 75 percent of divorced men and 70 percent of divorced women remarried within fifteen years.

children from second marriages appear to show a similar relationship to second-marriage divorce rates as that of children in first marriages, we have intriguing results that suggest children from first marriages are a destabilizing influence in second marriages.⁵

The Impact of Changes over Time

In examining the rise in divorce over time we note that the behavior of the annual time series of U.S. divorce rates since, say 1920, has exhibited a slow but more or less steady increase, with two periods of major acceleration: a burst in 1943-1947, then a return to the prewar level, and an even larger and more protracted burst since 1967.

Regarding the long-run upward trend, the positive relationship between the probability of divorce and the level of income is one of the apparent contradictions between the time series and our cross-sectional findings. We suggest a line of argument that may prove useful in work currently under way in reconciling these findings: as real wages rise for men and women, the degree of division of labor between spouses diminishes and the resulting increase in women's labor market attachment lowers the gains from marriage, leading to increased divorce. However, a lower overall gain from marriage should also be reflected by a decline in the probability of marrying in the first place and in the probability of remarriage as well, and at least until the most recent few years no such indication was present in the national statistics.

The general decline in fertility over time does appear broadly consistent with the cross-sectional evidence of a negative relationship with divorce, and the postwar baby boom corresponded to the only extensive period in the past few decades in which the divorce rate declined. As discussed above, the cross-sectional relationship is not a simple one, so here, too, further reconciliation of the time series with cross-sectional results is called for.

Note that the growth in divorce may build upon itself in several respects. A rise in divorce increases the pool of nonmarried people from whom one might find a preferred spouse and with whom one might associate without social stigmas if divorced. Also, as the number of divorced persons increases, the general social acceptance of divorce and the codification of this acceptance in laws governing divorce would be expected to be modified. The easing of divorce laws in many states since 1970 is no

doubt a reflection of this increased tolerance, as well as an influence on the rate of divorce.

The two major disruptions from the slow upward trend in U.S. divorce rates — the war years and the most recent decade — offer an important test of any theory of divorce behavior. The higher levels of divorce during and immediately after World War II can be viewed as reflecting several of the cross-sectional results discussed above. The war was both an event unforeseen in the case of many older marriages and one that precipitated more hastily arranged marriages — hence marriages among less well-informed couples. Furthermore, as a result of the forced separation between spouses and the dislocating effects of the war, the amount of "spouse-specific" capital was probably reduced in many marriages. All of these forces would be expected, on the basis of cross-sectional results, to lead to higher divorce rates.

As to the precipitous rise in divorce rates since 1966, a major focus of attention in our study, we note that, due to the fluctuation in births over the preceding decades, a larger than usual portion of the married population is young and hence in the early years of marriage, when divorce rates are normally high. A decomposition of the rise in the aggregate divorce rate during the '60s suggests that about 12 percent of the growth is attributable to this shift in the age structure of the married population. Far more important has been the change in the age-specific divorce rates. The rise in these age-specific rates appears to be far greater for younger couples: for example, the per annum growth rate from 1970-1974 in the divorce rate for women aged 25-29 is estimated as 7.5, while for women aged 40-44 the per annum growth rate was only 4.2. In sum, younger couples have higher divorce rates, have shown the most rapid growth in divorce rates in the past decade, and have increased their proportion in the married population. This explains my estimate that women in their twenties have contributed over 60 percent of the recent growth in the divorce rate although they comprise about 20 percent of the married population.

In addition to the age variation, we investigated other important factors in the changes in the divorce rate annually from 1920 on and came to this provocative conclusion: a major explanation of the rise in divorce in the past decade has been improved birth control technology (the oral contraceptive and intrauterine devices were first marketed in the United States in the early 1960s). Among the rea-

⁵The direction of causation between the presence of children and the likelihood of divorce is a complex issue discussed at length in the Becker, Landes, Michael paper. We have evidence which we find convincing of causation flowing in both directions.

sons suggested for the impact of contraceptive technology on divorce are that it has (1) effected a reduction in actual fertility which in turn has reduced the costs of divorce, and (2) eliminated (or drastically reduced) uncertainty about future, unwanted pregnancies, thus encouraging additional labor market career investment by women, which, in turn, reduces the benefits from remaining married.⁶

Some Concluding Thoughts

Over the decade from 1962 to 1972, the U.S. divorce rate rose from about 9.0 (9 divorces per annum per 1000 married women) to about 17.0. Of that 8 point rise in the divorce rate, about 3.5 points are estimated to be related to the change in contraceptive technology, an additional 2.5 points to demographic shifts reflected in the duration of marriage, and an additional 2.0 points to the growth in income (including the increased earnings of women).

While we have made substantial progress toward understanding some of the determinants of divorce both cross-sectionally and over time, there are many remaining issues for future research (some representing extensions of work already completed). For example, divorce rates have risen rapidly in many Western European countries but not universally, so international data are both a rich source and a major challenge; likewise, the changes in divorce laws in recent years among U.S. states offer another important data resource for studying the impact on behavior of changing laws. More generally, the relationship between divorce-and-remarriage and job turnover is discussed in some of our papers but has not yet been fully exploited. Beyond these issues pertaining to causes of divorce, there is surprisingly little known about the repercussions of marital instability. We hope to pursue several of these areas in our future research.

Family Migration Decisions

Jacob Mincer

The study of family migration decisions is part of continuing research on work experience and life-

time earnings conducted by the author at the National Bureau in association with Ann Bartel and George Borjas, with the objective of exploring the determinants of labor mobility and job tenure as well as the consequences of job experience on the evolution and structure of wages.¹ The following summary is part of a chapter on geographic mobility, focusing on its family context, described at greater length in NBER Working Paper No. 199, and represents a bridge to other NBER studies in the field of family economics (see the article by Robert T. Michael above). It defines family ties relevant to migration decisions and explores their effects on the probability of migration, consequent changes in employment and earnings of family members, and on family stability itself.

1. An Economic Definition of Family Ties

Family ties are defined here only in relation to migration decisions. In the case of a single destination, ties exist when potential migration gains or losses of individual family members differ in sign (positive versus negative): the tied person is one whose gain (or loss) is overruled by the bigger loss (or gain) of the other family members.

In the more general case of several potential destinations, ties exist so long as the gain of at least one spouse in the family's optimal location is less than his or her "private" (i.e., in the absence of the family) gain. In this case both spouses can be "tied," although the discrepancy from the private optimum is likely to be larger for the spouse with the smaller gain. Indeed, the discrepancy is a measure of the negative externality the decision to move (or to stay) imposes on an individual family member.

These externalities are usually, but not always, internalized by the family. They are absorbed without undermining family integrity so long as the sum of the ties is less than the gain from marriage. Otherwise, the family dissolves, and at least one person moves. The notion that families move whenever family gain from migration is positive and stay when it is negative must, therefore, be amended: the sign of the family gain is a necessary, but not sufficient, condition for the decision to move (or not to move) as a family.

⁶Lest one question whether contraceptive technology was actually improved by the advent of the pill-IUD: with pre-pill technology the actual in-use effectiveness of the better contraceptives left couples with a risk of pregnancy in ten years of about 75 percent; with the pill that probability has been estimated to be below 10 percent.

¹This research project is, in part, a sequel to the author's 1974 NBER volume *Schooling, Experience, and Earnings*.

2. Family Ties and Working Wives: Deterrents to Migration

The presence of family ties deters migration of families, even though it creates "tied" movers as well. Since gains or losses from migration are increased by job mobility, two-earner families are more likely to be deterred than single-earner families. Single earners in husband-wife families are almost always men, so it is families with working wives whose migration is most likely to be inhibited.

Empirical evidence on the effects of marital status confirms these propositions. The frequency of migration of married men is, on average, about one-sixth less than that of all others, and as much as one-third less when their wives work. More specifically, married persons are somewhat less likely to move than singles, and the mobility of separated and divorced parents is by far the highest. The mobility of singles is dampened by the fact that many of them are "tied" members of households headed by parents or other close relatives. In contrast, the mobility of separated and divorced parents is augmented by their relatively recent change of marital status, which creates a change of locational equilibrium. The same effect, of course, holds for newly married couples.

Evidence on lower migration rates for families with working wives is abundant. The deterrent effects are stronger when the wife's attachment is more permanent and when she is more educated. In contrast, families classified by education of husband are more likely to move: educated husbands' contribution to family income is larger and their gain from migration is more likely to outweigh their wives' losses.

The deterrent effect of the wife's employment and education increases with distance, while the husband's education is positively related to the distance of migration. At shorter distances (intracounty moves), wives' earnings actually permit more intensive search activities by husbands. Indeed, search by both spouses is not inhibited, since residential changes or commutes can accommodate job changes of each. According to our analysis, where the female-to-male earnings ratio is higher, the incidence of immobilized husbands increases. Consequently, local mobility increases relative to long-distance migration.

Since wives' earnings permit a greater scope for

purposive search by husbands, working wives increase the probability of husbands' job change (by quit). Job changers are more likely to migrate than those who do not quit; thus, wives' work indirectly also exerts a positive effect on migration in addition to the negative effect already described. The deterrent effect of wives' employment is, therefore, more clearly observed in comparison with local job changers than with all nonmigrants.

3. Effects of Migration on Employment and Earnings

Employment of women who moved with their families between 1965 and 1970 was reduced by 20 percent compared to that of stayers. Unemployment of migrant wives was twice as high as that of stayers, while migrant husbands' unemployment was 50 percent higher than that of stayers; migration tends to reduce the unemployment of men and to increase the unemployment of women, since women tend to be tied movers. Unemployed men with working wives, however, tend to search longer at the point of origin than unemployed husbands of nonworking wives, even if they eventually migrate.

Migrating wives experience increased unemployment, reduced employment, and labor force withdrawals at destination, and these effects increase with distance. The reasons, some of which have already been stated, are (1) postponement of job search until after the move, (2) increase in husband's income and decrease in wife's employment opportunity, and (3) at least temporary increases in family demand for the wife's household activities. Not only tied movers, but also tied stayers experience adverse effects in the labor market: the restriction of job mobility to short distances reduces the scope of job search and opportunities for advancement and heightens the probability of job mismatch, unemployment, and labor force withdrawal.

As to the effects on earnings, in migrating families the average gain in earnings is generally positive for husbands and negative for wives. The greater the loss in wives' earnings, the larger the gain in husbands' earnings. Of course, the latter exceeds the former, in absolute values.

We may conclude that the growth of two-earner families increases unemployment of both sexes, but primarily that of women. By interrupting the continuity of women's work, tied migration leads to

slower growth of wages, that is, to an increase in the sexual wage gap over the life cycle. The adverse effect on wage growth can occur even without discontinuity of employment, since the mere interruption of job tenure reduces incentives of worker and employers to engage in job-specific investments. Tied migration ranks next to child rearing as an important dampening influence in the life-cycle wage evolution of women.

4. Migration as Cause and Effect of Family Instability

Family location decisions can be a challenge to family integrity by imposing "private" negative externalities on at least one of the spouses. Usually, these externalities are internalized by the family. However, when the externality (T) exceeds the gain from marriage (M), the marriage dissolves. The likelihood of a breakup occasioned by location decisions is increased when marital stability is uncertain for other reasons: if p is the probability of preserving the marriage (regardless of location), then the expected gain from marriage is pM , and the condition for breakup is $T > pM$. Thus, the less stable the marriage, the greater its vulnerability to tied migration decisions.

When an unstable marriage dissolves, each of the spouses follows his or her (old or new) private optimal location. Thus, not only do migration incentives contribute to instability, but instability — whatever its source — increases migration. In data covering histories of men up to age 39, less than 2 percent of the marriages dissolved in an average (random) year. However, within a year bracketing a geographic move, 5 percent of the families broke up. Also, while 8 percent of married men moved in a random year, 19 percent moved in a year bracketing marital breakup.

The increasing equalization of labor market attachments of men and women creates an increase in migration ties, which both deters migration and contributes to marital instability. At the same time, the recent dramatic trends in marital instability stimulate migration of separated persons. The net effect of trends in migration rates is barely perceptible, but the effects on marital instability are reinforcing. In turn, feedbacks on women's labor supply reinforce the upward trends in their market employment.

Current NBER Working Papers

The following list includes all working papers issued during the first ten months of 1977. Those marked by an asterisk denote papers for which abstracts are presented below.

NOTE: 2 copies of (the same or different) working papers can be obtained free of charge by writing to the appropriate issuing office: (N) New York — 261 Madison Avenue, New York, N.Y. 10016; (C) Cambridge — 1737 Cambridge Street, Cambridge, Mass. 02138; (W) NBER West — 204 Junipero Serra Blvd., Stanford, Calif. 94305. Orders for more than 2 working papers from a single office should be accompanied by \$1.00 for each additional copy. Please make check payable to National Bureau of Economic Research, Inc.

- #160 (C), J. Huston McCulloch, "Misintermediation and Business Fluctuations" (Jan. 1977)
- #161 (N), Ann Bartel and George Borjas, "Middle-Age Job Mobility: Its Determinants and Consequences" (Jan. 1977)
- #162 (W), Sherwin Rosen, "Labor Quality, the Demand for Skills, and Market Selection" (Feb. 1977)
- #163 (W), Sam Peltzman, "The Gains and Losses from Industrial Concentration" (Feb. 1977)
- #164 (N), Anne O. Krueger, "Alternative Trade Strategies and Employment — Plan of Research for Country Studies" (Jan. 1977)
- #165 (C), Gene Golub, Virginia Klema, and G. W. Stewart, "ROSEPACK Document #4 Rank Degeneracy and Least Square Problems" (Feb. 1977)
- #166 (W), Robert Halvorsen, "Industrial Demand for Energy" (Feb. 1977)
- #167 (C), Cheng Hsiao, "Money and Income Causality Detection" (March 1977)
- #168 (W), Edward Lazear, "Wage Differentials Are Larger than You Think" (March 1977)
- #169 (C), David M. Gay and Robert B. Schnabel, "Solving Systems of Nonlinear Equations by Broyden's Method with Projected Updates" (March 1977)
- #170 (C), J. Huston McCulloch, "The Austrian Theory of the Marginal Use and of Ordinal Marginal Utility" (March 1977)
- #171 (C), J. Huston McCulloch, "The Effect of Minimum Wage Legislation on Income Equality: A Theoretical Analysis" (March 1977)
- #172 (W), James J. Heckman, "Sample Selection Bias as a Specification Error" (with an application to the estimation of labor supply functions) (March 77)
- #173 (C), Roy E. Welsch and Edwin Kuh, "Linear Regression Diagnostics" (March 1977)
- #174 (N), Edward N. Wolff and Joel Hay, "Educational Screening and Occupational Earnings" (April 1977)
- #175 (C), David M. Gay, "Some Convergence Properties of Broyden's Method" (April 1977)
- #176 (N), Irving B. Kravis and Robert E. Lipsey, "Export and Domestic Prices under Inflation and Exchange Rate Movements" (May 1977)
- #177 (W), James J. Heckman, "Dummy Endogenous Variables in a Simultaneous Equation System" (May 1977)

- #178 (C), Benjamin M. Friedman and V. Vance Roley, "Investors' Portfolio Behavior under Alternative Models of Long-Term Interest Rate Expectations: Unitary, Rational, or Autoregressive" (April 1977)
- #179 (C), Benjamin M. Friedman and V. Vance Roley, "Identifying Identical Distributed Lag Structures by the Use of Prior Sum Constraints" (May 1977)
- #180 (N), Linda Nasif Edwards and Michael Grossman, "An Economic Analysis of Children's Health and Intellectual Development" (May 1977)
- #181* (N), Irving B. Kravis and Robert E. Lipsey, "Price Behavior in the Light of Balance of Payments Theories" (June 1977)
- #182* (N), Irving B. Kravis, Robert E. Lipsey, and Eliot R. J. Kalter, "Export Prices and Exchange Rates" (July 1977)
- #183 (W), Richard Butler and James J. Heckman, "The Government's Impact on the Labor Market Status of Black Americans: A Critical Review" (June 1977)
- #184 (W), Gary S. Becker, "A Theory of the Production and Allocation of Effort" (July 1977)
- #185 (W), Lee A. Lillard, "Estimation of Permanent and Transitory Response Functions in Panel Data: A Dynamic Labor Supply Model" (July 1977)
- #186* (C), Martin Feldstein, "Do Private Pensions Increase National Saving?" (July 1977)
- #187 (W), Eytan Sheshinski, "A Model of Social Security and Retirement Decisions" (July 1977)
- #188 (W), Jerry Green, "Notes on the Public Debt and Social Insurance" (July 1977)
- #189 (C), David Coleman, Paul Holland, Neil Kaden, and Virginia Klema, "A System of Subroutines for Iteratively Reweighted Least Squares Computations" (July 1977)
- #190 (W), Bert G. Hickman, Yoshimi Kuroda, and Lawrence J. Lau, "The Pacific Basin in World Trade: Part I, Current-Price Trade Matrices, 1948-1975" (August 1977)
- #191 (W), Bert G. Hickman, Yoshimi Kuroda, and Lawrence J. Lau, "The Pacific Basin in World Trade: Part II, Constant-Price Trade Matrices, 1955-1975" (August 1977)
- #192 (W), Bert G. Hickman, Yoshimi Kuroda, and Lawrence J. Lau, "The Pacific Basin in World Trade: Part III, An Analysis of Changing Trade Patterns, 1955-1975" (August 1977)
- #193* (C), Martin Feldstein and David Hartman, "The Optimal Taxation of Foreign Source Investment Income" (August 1977)
- #194 (N), Daniel A. Graham, "Cost-Benefit Analysis under Uncertainty"
- #195 (C), David E. Coleman, "Finding Leverage Groups" (August 1977)
- #196 (C), John E. Dennis Jr., David M. Gay, and Roy E. Welsh, "An Adaptive Nonlinear Least-Squares Algorithm" (August 1977)
- #197 (C), Thomas E. Cooley, Steven J. DeCanio, and M. Scott Matthews, "An Agricultural Time Series-Cross Section Data Set" (August 1977)
- #198 (N), Ann P. Bartel, "The Economics of Migration: An Empirical Analysis with Special Reference to the Role of Job Mobility" (August 1977)
- #199 (N), Jacob Mincer, "Family Migration Decisions" (August 1977)
- #200 (W), Anna Luiza Ozorio de Almeida, "Share-Tenancy and Family Size in the Brazilian Northeast" (August 1977)

- #201 (C), Martin S. Feldstein, "The Welfare Cost of Permanent Inflation and Optimal Short-Run Economic Policy" (September 1977)
- #202 (W), Robert T. Michael, "Two Papers on the Recent Rise in U.S. Divorce Rate" (September 1977)
- #203 (W), Eytan Sheshinski, "Taxation, Inflation, and Monetary Policy" (September 1977)
- #204 (W), Michael J. Boskin and Michael D. Hurd, "The Effect of Social Security on Early Retirement" (September 1977)
- #205 (C), Benjamin M. Friedman and V. Vance Roley, "Structural Models of Interest Rate Determination and Portfolio Behavior in the Corporate and Government Bond Markets" (September 1977)
- #206 (C), Martin S. Feldstein and Anthony Pellechio, "Social Security and Household Wealth Accumulation: New Microeconomic Evidence" (October 1977)
- #207 (C), Martin S. Feldstein and Daniel Frisch, "Local Government Budgeting: The Econometric Comparison of Political and Bureaucratic Models" (October 1977)
- #208 (W), H. M. Shefrin and Richard Thaler, "An Economic Theory of Self-Control" (October 1977)
- #209 (W), W. F. Sharpe, "Bank Capital Adequacy, Deposit Insurance, and Security Values (Part I)" (October 1977)

Working Paper 181: Price Behavior in the Light of Balance of Payments Theories

Irving B. Kravis and Robert E. Lipsey

Our aim here is to identify the price behavior implied by different theories of balance of payments adjustment, describe the actual behavior of the relevant prices, and compare the actual behavior with the theoretical expectations. Balance of payments adjustment theories are viewed as falling into two groups — "standard" theories, incorporating price elasticity, multiplier, and absorption approaches, and the more recent monetary theories. The latter typically rest on assumptions of rapid and complete arbitrage in commodity markets and therefore uniform prices and price movements, and tend to minimize the role of changes in relative prices and quantities.

The price behavior observed does not correspond precisely to either view of prices, but differs most sharply from the implications of the monetary theories. Price levels, translated into a common currency, differ significantly among countries, and move differently even over periods of 10 to 20 years. There are substantial differences among the export prices offered by different countries for the same or similar goods and also among price movements. Export prices differ from domestic prices for the same goods and move differently as well. Many

of these relative price changes are accompanied by, and seem to explain, changes in relative quantities, and therefore have some economic significance. Even in the period of floating exchange rates price movements are not quickly offset by exchange rate changes, nor do they, in turn, automatically offset the exchange rate movements.

These findings suggest that the imperfections of markets and the complexities of price behavior give each country — even one highly integrated into the world economy — some leeway for the pursuit of independent monetary and fiscal policies.

Working Paper 182: Export Prices and Exchange Rates

*Irving B. Kravis, Robert E. Lipsey,
and Eliot R.J. Kalter*

During the last few years a number of attempts have been made to examine the extent to which exchange rate changes were "passed through" to prices of exports and imports. It might be asked, for example, to what extent a depreciation in the U.S. dollar resulted in a corresponding decline in prices of U.S. exports, measured in foreign currencies. The possibility that a change in the exchange rate might alter the relationship between a product's export price and its domestic price, expressed in the same currency, has been almost completely ignored.

In this study we examine the relation of exchange rates to export and domestic prices, using matched export and domestic price series for 4- and 5-digit SITC categories of U.S. machinery exports, 1953 through 1974, and indexes of the foreign currency value of the U.S. dollar, weighted for each 4- or 5-digit category by the relative importance of each country in U.S. exports. The results indicate that the relation of export to domestic prices is affected by foreign influences such as foreign price and income changes relative to those in the United States. Exchange rates also have an influence, with a depreciation tending to raise export prices as well as the export-domestic price ratio and an appreciation tending to lower them. Most of the equations suggest that U.S. exporters initially "pass through" the full effect of a devaluation (or appreciation) to their customers in the form of lower foreign currency prices. Then exporters gradually adjust their foreign currency export prices by raising their dollar export prices. By the end of two or three years one fourth to one half of the depreciation has been offset by these export price increases in dollars.

Working Paper 186: Do Private Pensions Increase National Saving?

Martin S. Feldstein

The analysis and statistical estimates presented in this paper point to an important difference between the aggregate economic impact of private pension programs and that of unfunded public social security programs. While such public social security programs are likely to reduce national savings by acting as a substitute for household retirement saving, this tendency is offset in private pension programs by the combination of the companies' partial funding and the shareholders' response to unfunded liabilities. Of course, neither effect is theoretically unambiguous. The adverse savings effect of social security can be offset by induced retirement, changes in intergenerational transfers, et cetera. And private pensions could in principle decrease aggregate saving if covered employees reduce their other saving by more than the sum of pension-funded accumulation and the induced extra saving of shareholders.

These theoretical ambiguities emphasize the need for empirical research. Several earlier studies implied that social security does depress private saving. By contrast, the current paper indicates that the growth of private pensions has not had an adverse effect on saving and may have actually increased saving by a small amount.

Working Paper 193: The Optimal Taxation of Foreign Source Investment Income

Martin S. Feldstein and David Hartman

The growing importance of foreign investment throughout the world has made taxation of the resulting investment income a significant problem for both the host country in which the investment is made and the home country from which the capital comes. In this paper Feldstein and Hartman derive optimal tax rules for both the capital exporting and capital importing countries. Among other things, and of particular interest to a large foreign investor like the United States, they find the tax that is optimal for a capital exporting nation when other countries adjust their tax rates in response.

The paper begins with the relatively simple problem of optimal taxation as viewed by the home country when it can assume that its actions do not alter the tax rate abroad. For an important special case of the problem, i.e., when foreign investment

accounts for a small fraction of host country production, the optimal tax rate corresponds to a common policy prescription: the capital exporting country should tax foreign source profits (after foreign tax) at the same rate it taxes domestic profits.

Next the authors examine the important question of tax rate interdependence, assuming that host countries are small relative to the capital exporting country. The tax rate in the capital exporting country is therefore regarded as fixed by the host countries when they are choosing their optimal tax rates. Under quite general conditions, it turns out that it is optimal for the host country to tax foreign source income more heavily than the "full taxation after deduction" rule suggests. By raising its tax rate, the home country can reduce the tax rate levied by the host countries.

The optimal tax is then discussed in the case where, instead of relying exclusively on equity finance, the foreign investor increases his borrowing abroad as his equity investment increases. Although this raises the profitability to the home country of investment by its foreign subsidiaries, it does not necessarily alter the conclusions of the rest of the study about optimal tax rates. The paper concludes by indicating limitations of the current analysis and suggesting directions for extension.

☆ ☆ ☆

ASA-NBER Business Outlook Survey, November 1977

This report summarizes a quarterly survey of predictions by about fifty business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economic Statistics section of the American Statistical Association. Charlotte Boschan of the NBER and Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER are responsible for tabulating and evaluating these surveys. A full set of tables on the current survey is available from NBER; a complete record of the survey back to 1969 is available in the NBER Time Series Data Bank. For further information write Ann Wood, NBER, 261 Madison Avenue, New York, N.Y. 10016.

Real GNP in 1972 dollars will be \$1,393 billion in 1978, according to the median of forecasts made in the beginning of November 1977 by 38 forecasters. This will be a 4.3% increase over the \$1,335 billion which they predict for 1977. The increase in the GNP price deflator between 1977 and 1978 will be 5.9%. Actual and predicted year-to-year changes in current dollar GNP, real GNP, and the GNP implicit price deflator are shown in the three panels of the chart on page 18. Predictions are based on the median of forecasts made in November of each year since the inception of the survey.

Poor Outlook for Unemployment

The jobless rate is estimated at 6.9% of the labor force in the current quarter; a year from now it is still to be as high as 6.7%. The small decline will be completed in two quarters and unemployment will persist at the 6.7% level from the second through the fourth quarter of 1978. This forecast differs from those made by public officials and others who believe that unemployment will be reduced to between 6 and 6½% next year. In August the survey participants were also less pessimistic in that they set the unemployment rate at 6½% for Q3 1978.

Smaller Rise in Profits, Maintained Gains in Business Capital Outlays

Corporate profits after taxes will reach \$113 billion in 1978, a level about 9.4% higher than that for 1977. At the projected rates, profits would grow less than they did recently and less than GNP.

Business expenditures on plant and equipment are expected to keep rising considerably faster. Their annual gains in 1977 and 1978 are to be 13% and 12.6%, respectively; the projected increase between Q4 1977 and Q4 1978 is a similar 12.8%. At present inflation rates, more than half of these gains would be in real terms.

How Likely Is a Recession Next Year?

Forecasters are asked to assess the probabilities that real GNP will decline in any of the successive quarterly intervals covered by the survey. Changes in the distributions of these assessments are interestingly related to subsequent developments; e.g., the mean probabilities were relatively high (25 to 28 chances in 100) in the forecasts for Q2 1974 and Q3 1974 made in the surveys dated May and August 1973. Now these means rise from negligibly low for Q1 1978 to 21 chances in 100 for Q4 1978. The latter figure is relatively high, and so was the corresponding estimate for Q3 1978 in the previous

Projections of GNP and Other Economic Indicators, 1977-1978

	Annual			Percent Change		Quarterly								Percent Change	
	1976 Actual	1977 — Forecast —	1978 — Forecast —	1976 to 1977	1977 to 1978	1977			1978			Q3 77 to Q3 78	Q4 77 to Q4 78		
						Q3 Actual	Q4	Q1	Q2 Forecast	Q3	Q4				
1. Gross national product (\$ bil.)	1706.5	1888	2086	10.6	10.5	1911	1960	2014	2060	2110	2162	10.4	10.3		
2. GNP implicit price deflator (1972 = 100)	133.9	141.4	149.7	5.6	5.9	142.3	144.6	146.5	148.5	150.7	152.9	5.9	5.8		
3. GNP in constant dollars (bil. 1972 \$)	1274.7	1335	1393	4.7	4.3	1343	1356	1374	1386	1400	1412	4.2	4.1		
4. Unemployment rate (percent)	7.7	7.1	6.7	-0.6 ^a	-0.4 ^a	7.0	6.9	6.8	6.7	6.7	6.7	-0.3 ^a	-0.2 ^a		
5. Corporate profits after taxes (\$ bil.)	92.1	103.2	112.9	12.0	9.4	104.0 ^b	107.3	109.7	111.9	113.9	116.0	9.5	8.1		
6. Plant and equipment expenditures (\$ bil.)	120.5	136.2	153.4	13.0	12.6	138.4 ^c	142.2	146.2	151.3	155.7	160.4	12.5	12.8		
7. New private housing units started (ann. rate mil.)	1.538	1.92	1.88	24.8	-2.1	2.05	1.98	1.94	1.93	1.86	1.77	-9.3	-1.6		
8. Change in bus. inventories GNP accounts (\$ bil.)	13.3	17.7	17.6	4.4 ^d	-0.1 ^d	19.8	15.5	16.4	17.4	18.0	18.5	-1.8 ^d	3.0 ^d		

SOURCE: American Statistical Association and National Bureau of Economic Research, Business Outlook Survey, November 1977. The figures on each line are medians of 34 to 38 individual forecasts.

a. Change in rate, in percentage points.

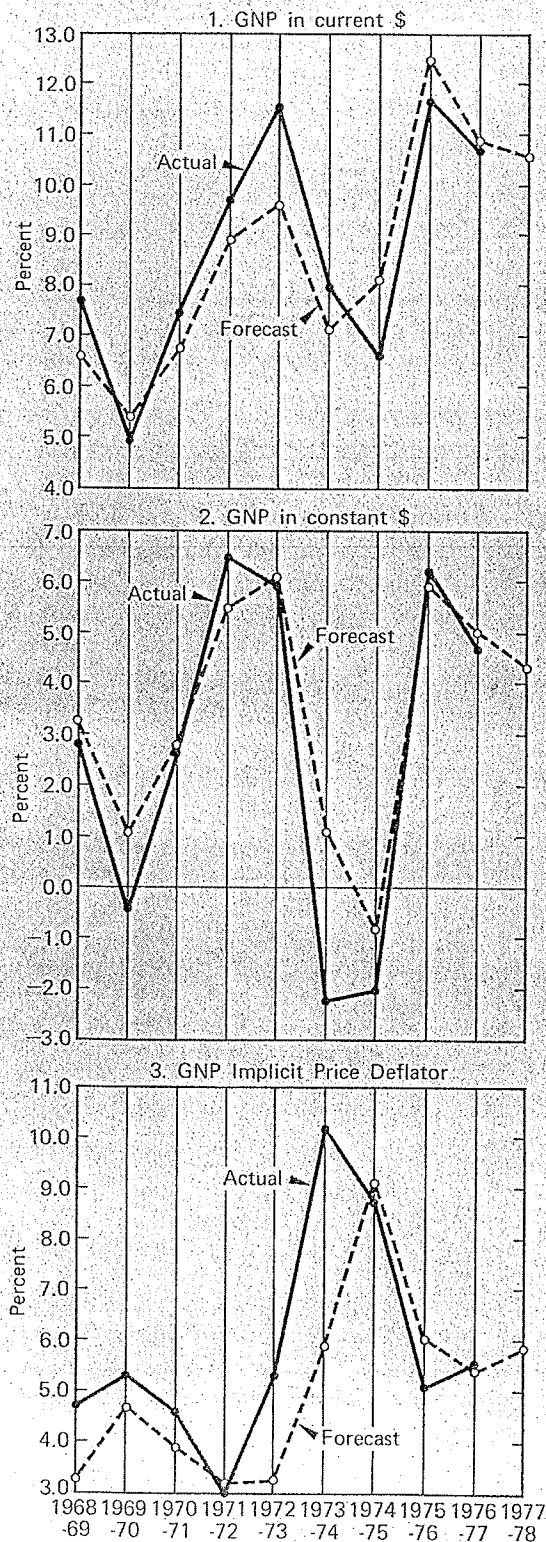
b. Actual not available. Based on average forecast.

c. Actual not available. Based on BEA survey of anticipations.

d. Change in billions of dollars.

survey (23%). These distributions, then, should bear watching in the near future.

Actual and Forecast Year-to-Year Change in GNP,
ASA-NBER Survey, 1968-78



Source: ASA-NBER Business Outlook Survey

Current NBER Publications

Education as an Industry

(Joseph N. Froomkin, Dean T. Jamison,
and Roy Radner, editors)

The importance of this volume, an outgrowth of an NBER conference of the same title, goes far beyond the academic community's sphere of interest. Its contents — eleven essays accompanied by critical comments — deals with the internal workings of the educational system and the tools currently being used to examine its performance. Here we have another example (see "Human Behaviorists' in Paris") of a research area concerned with the intangible wealth of society, where the techniques of production and distribution theory are applied to nonmarket behavior. Since empirical results are only as good as the quantitative measures used, a study of this nature, which brings together outstanding specialists with differing views on methodology and describes the research already accomplished, represents an important step forward in a relatively new field. Clearly, the light shed by *Education as an Industry* on the education establishment's costs, efficiency of resource allocation, and output in the form of achievement is of paramount interest to policymakers intent on improving the educational and thereby the economic and social fabric of the nation.

Policy implications run through the collection of essays like a unifying thread, particularly in regard to the concept of equal educational opportunity. For example, in Part I of the volume, devoted to educational production, Lewis J. Perl's "Investment in College Training" views the estimated production function as a guide to students, administrators, and the general public for improving the efficiency of educational investment — and as a mechanism for evaluating alternative means for achieving a more egalitarian distribution of educational output. In another essay in Part I, "Scholastic Achievement: Its Determinants and Effects in the Education Industry," Dennis J. Dugan analyzes the role of scholastic achievement as a form of nonmarket rationing practiced by suppliers of educational services, via admissions standards, to bring demand and supply factors into equilibrium. If this is so, the author argues, and if education is assumed to be an important vehicle for social mobility, all segments of society should have equal access to scholastic achievement. To this end he presents and empiri-

ally tests a model of scholastic achievement to isolate those factors that have the greatest impact on scholastic achievement and are most susceptible to public policy.

The two papers on compensatory education for disadvantaged students comprising Part Two of *Education as an Industry* run against the mainstream of the literature by reaching hopeful conclusions on the potential of schools to improve scholastic performance! The first — by Dean T. Jamison, J. Dexter Fletcher, Patrick Suppes, and Richard C. Atkinson — focuses on the cost and effectiveness of a single method of compensatory education: computer-assisted instruction, while the second — by Herbert J. Kiesling — examines a range of programs in California to identify the features common to the successful ones. Jamison et al., according to whom the two-fold purpose of compensatory education is to raise achievement levels and make the distribution of educational output more equitable, use a novel approach by applying techniques developed for analyzing inequality in income distribution to their evaluation of compensatory programs. The findings on compensatory education: (1) CAI produces consistent achievement gains when used over a substantial part of the school year, and (2) the characteristics common to the successful projects in the California sample include small group instruction by specialists, high ratios of managers to pupils, and a large percentage of key personnel at planning meetings.

Discussion of policy issues in Part Three, concerned with the stagnant state of productivity in higher education, leans heavily on faculty-student ratios. Radner presents evidence of a declining trend in faculty-student ratios in public and a slightly rising one in private universities. O'Neill, who shows that the rate of productivity change in

higher education has not kept up with that in effect elsewhere in the economy, describes existing explanations as mere speculations. This includes the notion that the built-in constraint of a particular faculty-student ratio dooms productivity change in education to lag behind the rest of the economy, where physical capital or alternative kinds of capital or labor can be substituted. Instead of speculation, she calls for systematic and objective empirical studies that would compare relative differences in costs and productivity among educational institutions producing similar outputs but operating with different personal incentives. The clarification of this issue may ultimately change methods of financing higher education — for example, away from direct aid to institutions in favor of direct aid to students, should the former be shown to impede productivity over the long pull.

Finally, in Part IV, actually entitled 'Policy Issues,' Joseph T. Froomkin poses the basic question: 'In a nutshell, education is being asked to equalize opportunity and control costs at the same time. Can economists contribute to the achievement of these goals?' His answer: economists do, indeed, have a great deal to contribute to the formulation of policy by looking at education "through the prism of industrial analysis" but we have only scratched the surface. He argues that a better understanding of learning theory may contribute to building more realistic educational production functions, and calls for broader models of the educational system to quantify the consequences of different combinations of resources and test disparate bits of information for consistency with each other. He also points to the need, among other things, of clarifying the concept of equality of educational opportunity, since the implication for the goals of educational reform differ substantially depending on the definition used.

NOTE: For a listing of recent and forthcoming NBER publications, see the September 1977 issue of the Reporter.

CONTRIBUTIONS AND SUBSCRIPTIONS

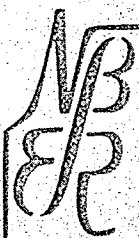
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National Bureau Reporter, edited by Hedy D. Jellinek, is issued several times a year by the National Bureau of Economic Research, Inc., 261 Madison Avenue, New York, New York 10016; telephone (212) 682-3190. It is distributed without charge to National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



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