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Program Report

Development of the American Economy

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The NBER's Program on the Development of the American Economy (DAE), established ten years ago, has continued the work of the Bureau in exploring the pace and pattern of economic growth in America. The DAE program's subjects—including income inequality, industrial productivity, the gender gap in earnings, long-run demographic change, savings and the capital stock—range widely in scope and time period but are united by a common methodology.

We focus on issues of current economic policy significance that require knowledge of long-term economic factors. For example, DAE researchers have demonstrated that we cannot understand current differences between male and female workers without knowledge of the past; similarly, we cannot comprehend the reasons for black and white income differentials today without historical study. In the past, such research efforts often had been stymied by the absence of suitable data. The DAE program already has assembled more than 50 historical datasets capable of revealing the relationship between the current and past behaviors of households and firms.

The DAE program covers seven major areas: labor and population; capital and savings; technology and productivity change; an industrial organization approach to governments and firms; industrial organization and business history; macroeconomic history; and political economy.[1] The results of DAE projects are now being disseminated in the NBER-DAE Historical Factors in Long-Run Growth Working Papers Series, and the NBER Working Paper Series. The DAE has also just initiated a series of monographs, Long-Term Factors in Economic Development, under the editorial direction of Clayne L. Pope and Robert W. Fogel. Thus

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[1] C. Goldin and C. L. Pope, "Report of the Development of the American Economy (DAE) Program of the National Bureau of Economic Research. Part I: Past Accomplishments and Continuing Projects," and "Part II: New Initiatives," both forthcoming as NBER Working Papers.

In This Issue

This issue of the *Reporter* highlights the Bureau's Program on the Development of the Economy. Next, James H. Stock and Jeffrey A. Frankel summarize their presentations at the NBER's Annual Research Conference. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

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far, 10 monographs written by 14 NBER-DAE research associates are scheduled for this series. Two have gone to press, one is being edited, and seven others are in varying stages of production.[2]

Because of the breadth of the DAE program, I have selected three projects to highlight here: gender differences in earnings and occupations; racial disparities in schooling and economic success; and the inequality of income and wealth on the American frontier. Each has been the primary research project of a DAE member for the past five years, and each is scheduled for inclusion in the monograph series.

Understanding the Gender Gap: An Economic History of American Women

In my recent book, I examine the evolution of the female work force, from the late eighteenth century to the present, and the historical roots of present gender inequalities. Like other DAE projects, this study draws on a variety of data sources, including Census manuscripts, city and business directories, original schedules of (U.S. Department of Labor) Women's Bureau bulletins, and U.S. Commissioner of Labor reports.

The labor force participation rate of married women in 1900 was about one-tenth what it is today; fewer than two workers out of ten were female in 1900, while almost half are female today. Yet in terms of earnings and occupations, women have fared less well. Occupations have been segregated by sex throughout our history, and this segregation diminished only slightly from 1900 to 1970. In both years, about two-thirds of all women or men would have had to change occupations to bring about parity by sex. The ratio of female-to-male earnings remained stable from the 1950s to the early 1980s, hovering around 60 cents on the dollar, although the ratio has increased substantially since 1981. Further, economic analysis indicates that less than half of the difference between the earnings of men and women can be explained by their observable characteristics,

[2] *The three books scheduled for publication within this year are: R. Floud, A. Gregory, and K. Wachter,* Height, Health, and History: Nutritional Status in the United Kingdom, 1750-1980 (New York: Cambridge University Press, 1990); C. Goldin, Understanding the Gender Gap: An Economic History of American Women *(Oxford, U.K.: Oxford University Press, 1990); and S. Preston and M. R. Haines,* Fatal Years: Child Mortality in Late Nineteenth-Century America *(Princeton: Princeton University Press, 1990). The remaining seven manuscripts are: L. E. Davis, R. E. Gallman, and T. Hutchins,* Whales and Men—Productivity and Profits: A Study of Technology, Institutions, and Market Changes in the American Whaling Industry, 1816-1906; *B. J. Eichengreen,* International Finance in Disarray; *R. W. Fogel,* The Escape from Hunger and Early Death: Europe and America, 1750-2050; *J. R. Kearl and C. L. Pope,* Wealth and Income Inequality at the Frontier: Utah, 1850-1900; *R. A. Margo,* Race and Schooling in the American South, 1880-1950: A Quantitative History; *K. L. Sokoloff,* In Pursuit of Private Comfort: Early American Industrialization, 1790-1860; *and R. H. Steckel,* Families on the Move: A History of Migration within the United States, 1700-1900.

other than gender, such as years of work experience and education.

The disparity between changes in the employment of women and the gender gap in earnings is disturbing to many. But rising participation need not lead to increased labor market experience, and generally it is years on the job that augments earnings for the individual. The connection between changes in participation and in work experience depends on whether women work intermittently or whether they are continuous participants over their life cycles. I find that adult working women remained employed for extensive periods. For example, in 1940 more than 60 percent of a group of 45-year-old married working women had been employed for 75 percent of the years since they began work. The great majority of employed women were continuous participants and as employment rates rose they were joined in the labor force by women whose previous work experience was distant and brief. For all currently employed women, therefore, years of work did not increase greatly during periods of rising participation.[3]

But the finding that married women were persistent workers also implies that earnings and occupational differences, in large measure, may reflect discrimination. Indeed, "wage discrimination," the portion of the gender gap in earnings that cannot be explained by measurable factors, was less than 20 percent among industrial workers around 1900, but had reached its current value of 55 percent by the mid-twentieth century, when a plurality of employed women were office and sales workers.[4]

Before 1940, more than 80 percent of all married women left the labor force at marriage, and the majority never returned to work. But among married women who did remain at work, a substantial fraction worked for much of their lifetime. Employers may have been unable to discern who among the young, single women would remain employed and who would not. The vast majority of women were channeled into rather dead-end jobs involving little job training and skill acquisition. I uncovered several hundred firm-level records revealing that more than 70 percent of firms hiring office workers excluded women, by company policy, both from entry-level jobs and from jobs farther up the occupational ladder.

Restricted access to these ladders, despite long tenure for many women, produced a measure of "wage discrimination" in 1940 that was approximately equal to estimates for the 1970s. Ironically, the ratio of female-to-male full-time earnings narrowed by 20 percent sometime around the 1920s. Men and women were nearly equal in years of education, and the burgeoning clerical sector offered financial returns to education that vastly exceeded those in manufacturing. Thus "wage discrimination" actually increased at the same time that the gender gap in earnings narrowed.[5]

"Marriage bars," the written policies of many firms and school districts not to hire married women and to fire single women when they married, were further impediments to women's economic progress that emerged from the late nineteenth century to the 1930s. These bars had their origins in certain personnel policies of firms and local school districts that made the retention of married women workers costly. The marriage bar was associated with tenure-based salary scales, written or implied contractual obligations of employers, and other modern personnel practices. At their height in the early 1940s, marriage bars affected more than 80 percent of all school districts and probably more than 50 percent of all female office workers.[6]

Because married women were only 20 percent of all women workers in the 1920s, marriage bars did not greatly restrict labor supply. But demographic and economic changes after the 1930s caused the bars to entail greater sacrifices by firms. In 1960, the available supply of young single women not attending school was almost one-fourth its 1900 level, while the proportion of educated and trained older married women was greater than ever. Only with the "labor squeeze" were marriage bars abolished by the majority of firms and school districts.

The history of gender in the workplace contains a number of lessons about the functioning of labor markets. Large changes in labor supply or demand often are needed to alter the structure of jobs and firm policies. No one firm wants to innovate in the hiring of married women, the integration of a particular occupation, or the granting to women of the right to return after ample maternity leave, unless the costs of not doing so are overwhelming. Firms eventually did innovate in all three areas. The market eventually may adjust, but the process is tempered and hampered by various norms, expectations, laws, institutions, and other factors that maintain the past within the present.

Race and Schooling in the American South, 1880–1950

Robert A. Margo's research concerns racial difference in earnings and education. Like mine, it begins

[3] *C. Goldin, "Life-Cycle Labor Force Participation of Married Women: Historical Evidence and Implications," NBER Working Paper No. 1251, December 1983; also in* Journal of Labor Economics *7 (January 1989), pp. 20-47.*

[4] *C. Goldin, "The Earnings Gap between Male and Female Workers: A Historical Perspective," NBER Working Paper No. 1888, April 1986.*

[5] *C. Goldin and S. Polachek, "Residual Differences by Sex: Perspectives on the Gender Gap in Earnings,"* American Economic Review *77 (May 1987), pp. 143-151.*

[6] *C. Goldin, "Marriage Bars: Discrimination against Married Women Workers, 1920s to 1950s," NBER Working Paper No. 2747, October 1988.*

with a set of historical facts concerning long-term trends. In 1900, annual earnings of the typical adult black man were just 45 percent of those of the typical white man. Forty years later, on the eve of World War II, the ratio was barely higher (48 percent). Yet in 1980, another 40 years later, the ratio had increased to 69 percent. Two frameworks have been advanced to account for the initial stability and subsequent rise in the earnings ratio: a dual labor market, or institutionalist, perspective, and a human capital model.

Institutionalists claim that black men, before World War II, were trapped in low-wage jobs in southern agriculture. Their absorption into better-paying jobs outside the farm economy was slow because of labor market discrimination in the South and the availability of a competing supply of labor—European immigrants—in the North. When immigration suddenly was curtailed during World War I, northern employers began hiring southern blacks, and their increased demand started the flow of blacks North. A further exodus occurred during the 1940s. But wartime economies alone were insufficient to equilibrate earnings. Additional shocks —the civil rights movement and antidiscrimination legislation—were, according to the institutionalist perspective, fundamental to black economic success after World War II.

Proponents of the human capital model argue that the initial stability of the earnings ratio can be explained by large and persistent racial differences in schooling. On the eve of World War II, the average black male worker completed 3.5 fewer years of school than the average white. Had the racial schooling gap been smaller before World War II, more blacks would have entered nonfarm jobs. After World War II, racial differences in schooling did narrow , and the racial earnings gap narrowed.

Margo's primary objective has been to quantify the relative historical merits of the institutionalist and human capital frameworks. Utilizing the rich and newly available public use samples of the 1900, 1910, 1940, and 1950 population Censuses, Margo finds that schooling enhanced the probability that a black man would leave southern agriculture for a job in industry, in the South or the North. Literate southern black men, for example, were four times more likely than their illiterate counterparts to leave the South.

But Census data also reveal that over half of the black migration North before 1940 cannot be explained by secular improvements in schooling and that important flows of black labor out of southern agriculture were associated with World War II.[7] Further, it appears that blacks were underrepresented in the expansion of nonfarm employment in the South, even when controlling for education. Indexes of occupational and industrial segregation in the South were about 35 percent higher in 1950 than in 1900, and the trend was not reversed until the civil rights movement of the 1960s. Margo concludes that the human capital and institutional models are each about half correct in explaining long-term trends in black incomes and occupations.

Having established that education increased the ability of black men to enter the nonfarm economy, Margo next explores the source of racial differences in schooling prior to World War II. One reason for the disparity is found in the discriminatory behavior of school boards. In *Plessy* v. *Ferguson* (U.S., 1896), the Supreme Court ruled that laws requiring racially separate public facilities were constitutional, provided that the facilities were equal. But because blacks were largely disenfranchised in the South, the equal part of the doctrine was generally disregarded. The violations of *Plessy*, Margo argues, hindered the educational attainment of black children and thus their ability to leave the farm economy.[8]

But even if the equal part of the doctrine had been enforced, a large part of the racial schooling gap would have remained. Margo estimates that the average southern black child (5 to 16 years old) attended only 16 months of school around 1900, about half that of the average southern white child. Had separate-but-equal been enforced, the racial gap would have been reduced by 46 percent.[9] The poverty of black parents, itself caused in large measure by their lack of education, kept black children out of the classroom as much as the poor quality of black schools did. The racial schooling gap would have been larger still were it not for the extraordinary sacrifices black parents made to see their children educated. These were sacrifices, Margo concludes, that eventually paved the way for a narrowing in the schooling gap later in the century and the rise in the racial earnings ratio after World War II.

Wealth and Income Inequality at the Frontier: Utah, 1850–1900

The settlement of the American West, which involved the migration of millions of households, has been viewed as the most significant and unique force shaping American society, politics, and character. Three DAE researchers are studying the frontier settlement process with an emphasis on how income and wealth distributions evolved.[10]

[7] *R. A. Margo, "Schooling and the Great Migration," NBER Working Paper No. 2697, September 1988.*

[8] *R. A. Margo, "Educational Achievement in Segregated School Systems: The Effects of Separate-But-Equal," NBER Working Paper No. 1620, May 1985; also in* American Economic Review *76 (September 1984), pp. 794–801.*

[9] *R. A. Margo, "Accounting for Racial Differences in School Attendance in the American South, 1900: The Role of Separate-But-Equal," NBER Working Paper No. 2242, May 1987; also in* Review of Economics and Statistics *69 (November 1987), pp. 661–666.*

[10] *A summary of many of the results of the project may be found in C. L. Pope, "Households on the Frontier: Income and Wealth in Utah, 1850–1900, in* Markets in History: Economic Studies of the Past, *D. W. Galenson, ed. New York: Cambridge University Press, 1989.*

James R. Kearl, Clayne L. Pope, and Larry T. Wimmer collaboratively have assembled data from census manuscripts, family genealogies, church financial records, and tax rolls to form a statistical moving picture of Utah from its initial settlement in 1847 to the turn of this century. These data sources, unequalled for any other time or place, have enabled the researchers to create a longitudinal panel of 17,500 household heads with information on gross wealth, income, and occupation. They also have compiled residential histories, demographic data, and linkages of household heads to brothers and fathers within the panel. Utah, while not an entirely representative community, shared many essential features of other frontier areas in America.

Utah began its settlement, Kearl, Pope, and Wimmer report, with an egalitarian wealth distribution, at least in comparison with that of the United States. The Gini ratio, a convenient summary statistic ranging from no inequality (0) to total inequality (1), for real estate wealth in Utah was .69 in 1850, while it was .86 for the entire United States. The richest 10 percent of the population in Utah owned 52 percent of the wealth, while the richest 10 percent of the U.S. population owned 73 percent.[11] But the initially egalitarian distribution of wealth on the frontier did not last long. During the next 20 years, the distributions of income and wealth in Utah moved toward those of the rest of the nation. By 1870, the share of wealth held by the top 10 percent in Utah was 61 percent while the share of wealth held by the top 10 percent in the United States was 70 percent.

Increasing inequality was driven largely by forces related to the settlement process. The longer an individual remained in Utah, the greater was income and wealth, and this "rent to duration" was substantial. Each year of duration added more than 3 percent to the wealth and about 2 percent to the income of an 1870 household (controlling for age, occupation, birthplace, and county of residence). During the 1960s, the peak decade of settlement, the population of Utah more than tripled, and the majority of new householders were immigrants. Inequality was heightened both because the large population influx increased the variance in duration and because the foreign born were initially disadvantaged in comparison with those who migrated from other states.[12]

Kearl, Pope, and Wimmer find that family background was an important source of variance in both income and wealth. Unobserved family background, measured by the similarity in the economic circumstance of brothers (controlling for age, occupation, and other variables), accounted for 18 percent of the variance in income and 29 percent of the variance in wealth. But the economic similarity of brothers was not related primarily to the wealth of their parents. Parental occupation and wealth accounted for only 20 percent of the family background effect on wealth and 30 percent of the effect on income. Most of a family's influence on the economic outcomes of children came through indirect means rather than through direct transfers of wealth.[13]

Despite forces generating greater inequality with economic development, frontier Utah was a place of economic opportunity. Less than 23 percent of unskilled laborers remained so from one census to the next, compared with 68 percent for Boston. Most of the unskilled became farmers (49 percent to 65 percent, depending on the year), and significant numbers became artisans. Mobility in an economy can be measured, for example, by the number of deciles (tenths of the distribution) or quintiles (fifths of the distribution) that an individual moves within the wealth or income distribution. Wealth accumulation accompanied occupational change in Utah, and typical households in the poorest third of the 1860 wealth distribution moved upward by four deciles when observed next in 1870. Substantial mobility was present at all levels within the distributions of income and wealth. Of the households observed in both 1860 and 1870, 65 percent moved from one quintile to the next, up or down, and 29 percent moved two quintiles.

Rising income and wealth inequality in this settlement community does not support the view that the frontier was the egalitarian refuge of historical accounts. But any disillusionment with this finding should be moderated by the extensive economic mobility found by Kearl, Pope, and Wimmer in the Utah data. If Utah were representative of other frontier areas, then the closing of the frontier in 1890 did eliminate one source of economic opportunity that had been provided to millions of households during the previous century.

[11] *J. R. Kearl, C. L. Pope, and L. T. Wimmer, "The Distribution of Wealth in a Settlement Economy: Utah, 1850-1870," NBER Reprint No. 314, August 1982; also in* Journal of Economic History *40 (September 1980), pp. 477-496.*

[12] *J. R. Kearl and C. L. Pope, "Choices, Rents, and Luck: Economic Mobility of Nineteenth-Century Utah Households," in* Long-Term Factors in American Economic Growth, *NBER Studies in Income and Wealth No. 51, S. L. Engerman and R. E. Gallman, eds. Chicago: University of Chicago Press, 1986.*

[13] *J. R. Kearl and C. L. Pope, "Unobservable Family and Individual Contributions to the Distributions of Income and Wealth," NBER Working Paper No. 1425, August 1984; also in Journal of Labor Economics 4 (July 1986), pp. 548-579.*

Research Summaries

The following articles summarize two of the presentations made at the NBER's Annual Research Conference in New York on October 16.

Annual Research Conference—I:

Experimental Indexes of Leading and Coincident Economic Indicators

James H. Stock

The index of coincident economic indicators is a weighted average of several broad monthly indicators of current economic conditions. The index of leading economic indicators is a weighted average of a set of series that signal future changes in overall economic activity. My NBER research project with Mark W. Watson of Northwestern University takes a fresh look at these two indexes and develops new alternatives to the present Department of Commerce (DOC) indicators.

Although coincident and leading indicators currently are produced by the DOC, this is a fitting research project for the NBER. Indeed, the genesis of these indexes was a report written 52 years ago by Wesley Clair Mitchell and his research Associate Arthur F. Burns. That report developed the system of coincident, leading, and lagging indicators that has led to the indexes currently produced by the DOC.

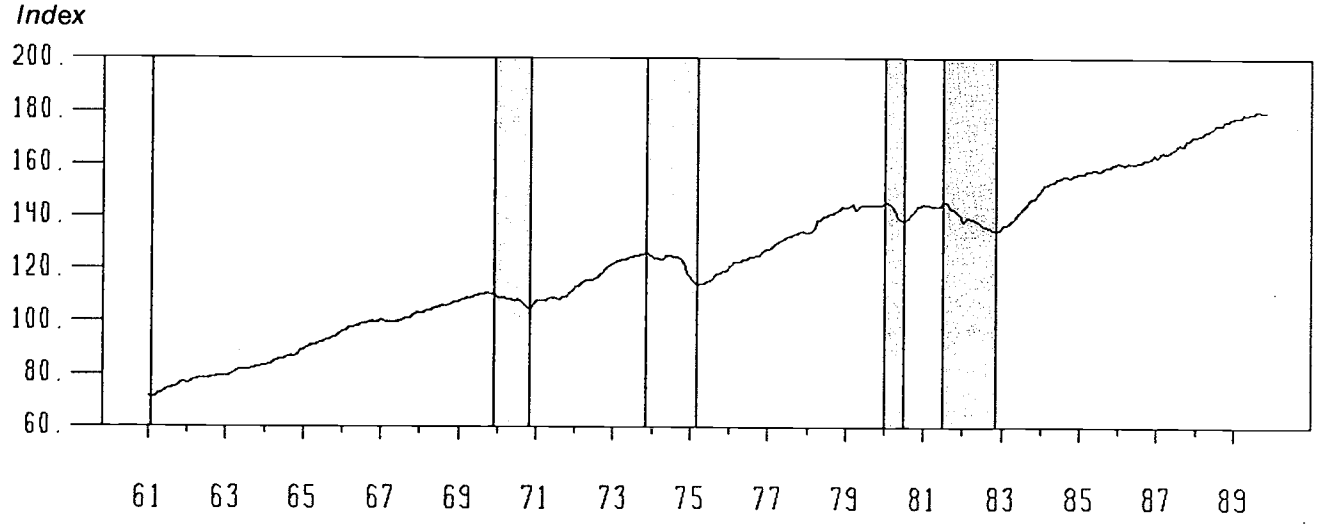
Watson and I started this project with two broad questions: first, how should we construct indexes that provide a timely and interpretable forecast of the state of the economy over the next six months? This question is motivated by the practical problem of using the DOC index of leading indicators to forecast a recession. For example, the rule of thumb that forecasts a recession if there are three consecutive declines in the DOC's monthly leading index is neither timely nor precise. Thus we focused on producing direct forecasts of short-term overall economic growth and of the probability of a recession.

Second, we asked which series to include in constructing these indexes. At a deeper level, how should we decide which series to include and which to exclude? The traditional approach to selecting series for the leading index basically has been bivariate; that is, comparing series one at a time to movements in the coincident index. In contrast, our approach to variable selection is multivariate. It focuses on picking series that have important predictive content on the margin: that is, that have predictive content given the other series in the index.

Three New Experimental Indexes

Our project has resulted in three new indexes. To distinguish them from the indexes produced by the DOC, and to emphasize that this is an ongoing research project, we refer to these as "experimental" indexes. The first of these indexes is the *experimental index of coincident indicators* (XCI). Like the coincident index produced by the DOC, the XCI is designed to measure —on a monthly basis—the current level of overall economic activity. The second index, the *experimental leading index* (XLI), forecasts the growth of the XCI over the next six months, scaled to provide annual rates. This index is computed using a revised set of leading variables. The third index, the *experimental recession index* (XRI), represents a new concept in the context of coincident and leading economic indicators. This index estimates the probability that the economy will be in a recession in six months. Because it is a probability, the index can range from 0 to 100 percent.

Figure 1. Experimental Index of Coincident Economic Indicators: Historical Values Since 1961



Experimental Index of Coincident Indicators (XCI)

The XCI is plotted in Figure 1. Cyclical peaks and troughs, as determined by the NBER's Business Cycle Dating Committee, are indicated by vertical lines. Our XCI is quantitatively similar to the coincident index produced by the DOC. Like the DOC series, ours is a weighted average of four broad measures of economic activity: industrial production; real personal income (less transfers); real manufacturing and trade sales; and employee-hours at nonagricultural establishments. The index is scaled to equal 100 in 1967.

The two main differences between our XCI and the DOC coincident index are, first, that we use employee-hours rather than the number of employees and, second, that we put some weight on lagged values of these series. These lagged weights arise naturally from the statistical model—a so-called dynamic factor model—that we use to construct this index. In any case, these weights are small. Overall, the correlation between the monthly growth in the XCI and the growth of the DOC coincident index is 95 percent.

In practice, the XCI can be thought of as a monthly measure of GNP, although it is somewhat more volatile than GNP itself because of differences in coverage. For example, if you average three months to construct a quarterly XCI and then compute the correlation between the two-quarter growth in GNP and the two-quarter growth in this quarterly XCI, this correlation is almost 90 percent. Because the XCI focuses on cyclically sensitive series such as manufacturing and trade sales, it is more volatile than GNP. The two series have approximately the same average growth rates since 1960, but a 1 percent deviation from the mean growth in the XCI roughly corresponds to a 0.6 percent deviation from the mean growth in GNP, at annual rates.

Experimental Index of Leading Indicators (XLI)

Figure 2 plots the XLI. This is a forecast of the growth of the XCI over the next six months. For example, the value of the XLI for January is a forecast of the growth of the XCI from January to July, at annual rates.

The XLI is a weighted average of current and lagged values of the four coincident series and seven leading series. The seven leading series were selected from an original list of 280 series. On a conceptual level, there were two main criteria for selecting the series from this longer list. First, each of the series chosen must make a useful forecasting contribution, given that the other series already were included in the index. This is the focus on multivariate, rather than bivariate, predictive content that I mentioned earlier. Second, the role of each series had to be stable over time. It was not enough that a series helped forecast the XCI only during the 1970s; for example, we also required the forecasting relationship to be stable, to the extent that this can be determined by econometric analysis. This series selection procedure started from scratch, not with a single predetermined base list of series.

Our seven leading series are: 1) new private housing authorizations; 2) manufacturers' unfilled orders in durable goods industries; 3) a trade-weighted index of exchange rates between the United States and five other nations (Japan, the United Kingdom, West Germany, France, and Italy); 4) part-time work in nonagricultural industries because of slack work; 5) the change in the ten-year Treasury bond rate; 6) a measure of the risk premium on high-grade, short-term private paper (specifically, the spread between the six-month commercial paper rate and the six-month Treasury bill rate); and 7) a measure of the slope of the yield curve (specifically, the spread between the yields on ten-year and

Figure 2. Experimental Index of Leading Economic Indicators: Historical Values Since 1961

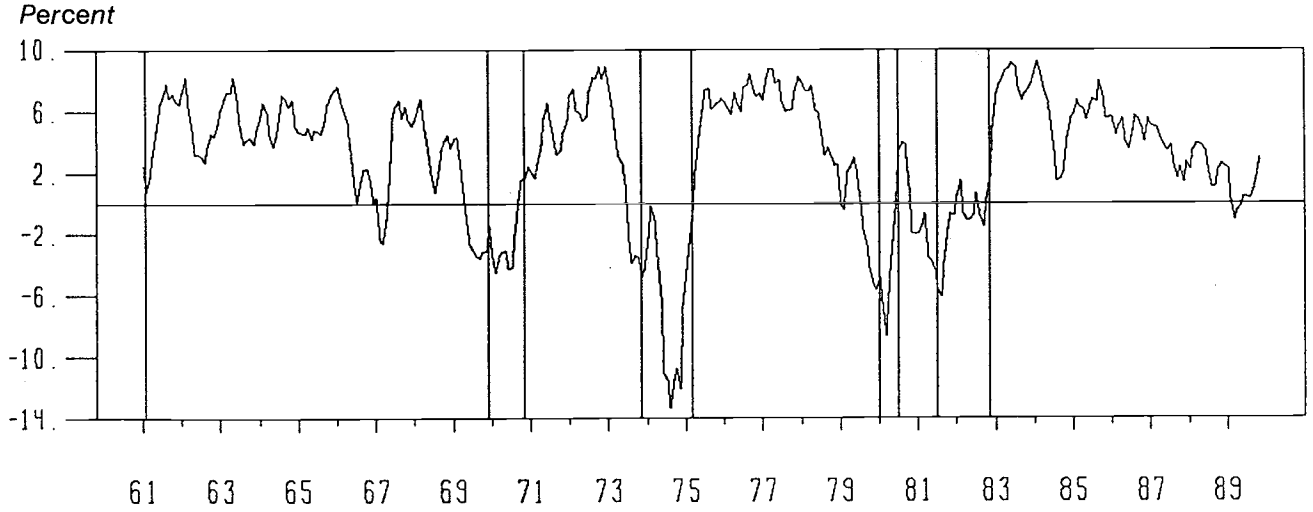


Table 1. Experimental NBER Coincident, Leading, and Recession Indexes: August 1989

Experimental Coincident Index	(XCI)	179.8
Experimental Leading Index	(XLI)	0.3
Experimental Recession Index	(XRI)	16 %

Components of the Experimental Leading Index

Series	*Contribution*
1) Housing Authorizations	-0.2
2) Manufacturers' Unfilled Orders	0.2
3) Exchange Rates	-0.6
4) Part-Time Work	0.0
5) Change in 10-Year Treasury Bond Rate	-0.3
6) Spread Between 6-Month Commercial and Treasury Bill Rates	-1.3
7) Spread Between 10-Year and 1-Year Treasury Bill Yields	-0.7
Trend	3.1

Revised Indexes (Based on Revised Data)

	89:07	*89:06*	*89:05*	*89:04*	*89:03*	*89:02*	*89:01*	*88:12*	*88:11*	*88:10*	*88:09*	*88:08*
XCI	179.4	179.0	178.7	179.0	177.9	178.0	178.0	177.2	176.5	176.5	175.2	175.0
XLI	0.5	0.5	-0.2	-0.5	-1.1	0.3	2.4	2.5	2.7	2.3	1.2	1.1
XRI	13 %	14 %	16 %	17 %	27 %	15 %	8 %	14 %	10 %	4 %	7 %	7 %

Components of the Experimental Leading Index

	89:07	*89:06*	*89:05*	*89:04*	*89:03*	*89:02*	*89:01*	*88:12*	*88:11*	*88:10*	*88:09*	*88:08*
1) Housing Authorizations	-0.2	-0.2	-0.5	-1.4	-1.8	-0.7	0.1	0.4	0.5	0.3	-0.1	-0.1
2) Manufacturers' Unfilled Orders	0.3	0.3	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.4
3) Exchange Rates	-0.9	-0.7	-0.5	-0.6	-0.4	0.3	0.9	0.8	0.0	-0.8	-1.1	-0.8
4) Part Time Work	-0.1	0.1	0.0	0.4	0.7	0.0	-0.2	-0.4	0.7	0.7	0.3	-0.2
5) Change: 10-yr T Bond Rate	-0.2	-0.2	-0.2	0.0	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.2
6) Spread: 6-mo. Comm/T Bill Rates	-1.1	-1.6	-1.8	-1.9	-2.2	-1.9	-1.1	-0.9	-1.2	-1.1	-1.3	-1.4
7) Spread: 10-yr/1-yr T Bills	-0.4	-0.5	-0.7	-0.7	-0.8	-0.8	-0.7	-0.7	-0.5	-0.1	0.1	0.3
Trend	3.2	3.2	2.9	3.3	3.1	2.9	3.1	3.1	2.8	3.2	3.0	2.8

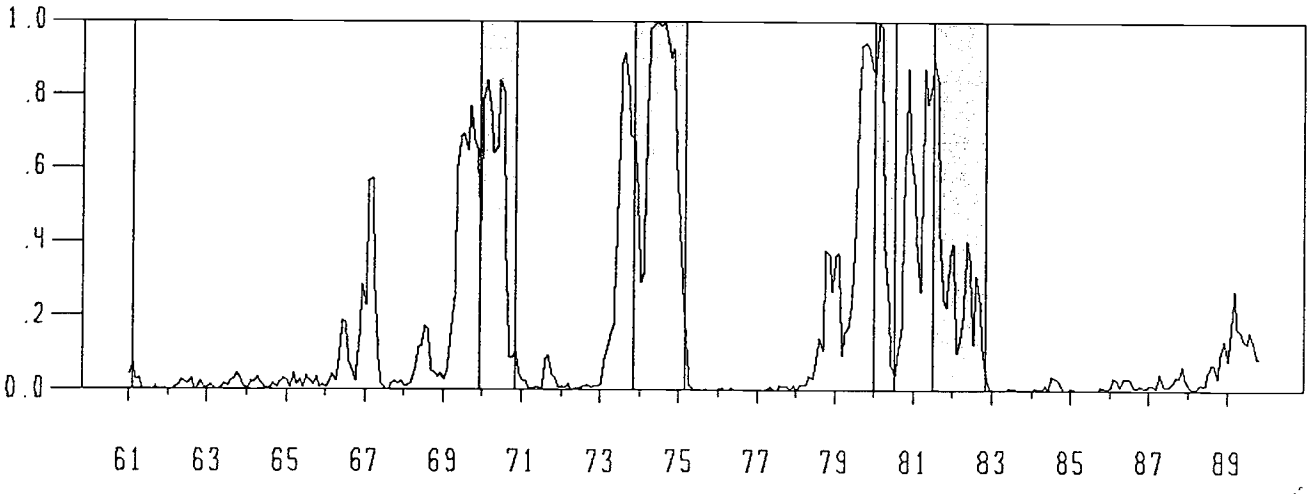
one-year Treasury bonds). See Table 1 for an example of the use of these series.

Two of these series—manufacturers' unfilled orders and housing authorizations—are in the current DOC leading index. Our series on part-time work is related closely to the DOC series on new claims for unemployment insurance. However, the remaining four series represent major departures from the traditional list of series.

Experimental Recession Index (XRI)

The XRI is plotted in Figure 3. It is a direct estimate of the probability that the economy will be in a recession

Figure 3. Experimental Recession Index: Historical Values Since 1961



in six months and, as such, is a new concept. This probability is computed within the context of the econometric model used to construct the coincident and leading indexes. Thus the XRI has the same components as the XLI, but the various series are combined so as to predict recessions directly.

How Useful Are the Experimental Indexes?

The ultimate usefulness of these new indexes can be determined only by their future ability to forecast recessions and expansions. We have been producing these indexes for less than a year—too short a time to be able to evaluate their out-of-sample performance.

However, we can examine the simulated predictive performance of the series within the historical sample. By this standard, their performance is very good. For example, the XRI ideally would have a value of one exactly six months before a cyclical trough and would shift to zero exactly six months before a cyclical peak.

As can be seen in Figure 3, the performance during the 1970, 1974, and 1979 recessions was good, although the performance during the 1982 recession was less satisfactory. Also, the XRI would have signaled a recession in 1967, although in fact there was no recession then. This is a much better track record than one based on the "three consecutive declines" rule of thumb applied to the DOC leading index. Thus we are optimistic about the potential of this index.

Comparison of Series in DOC and Experimental Indexes

Since its most recent revision in January 1989, the DOC leading index has been based on 11 leading indicators. However, only two of these series appear on our list. Therefore, it makes sense to ask whether the DOC series really do belong on our list and, if not, why not. When we looked into this, we concluded that, given the other series in the index, none of these nine series made any important additional forecasting contributions. In contrast, given various sets of series from the DOC list, when we added series from our list, these new series in fact did result in important improvements.

Perhaps the two most noteworthy examples of series that have been identified traditionally as important leading indicators but that are not on our list are the money supply (M2) and stock prices. Some people have found one conclusion of our analysis surprising: that including the money supply or stock prices in our indexes did not help. In fact, these series had considerable potential to hurt the performance of these indexes. Concerning stock prices, the clearest example of this was October 1987, although three months earlier we already had reached our conclusion that stock prices did not belong in the index.

Unconventional Series That Bear Watching

Our research has resulted in identifying indicators that deserve close attention. One of these is a measure of the slope of the far end of the yield curve as measured by the spread between ten-year and one-year Treasury bonds. This work provided statistical support for the observation that an inverted yield curve signals a future slowdown. A natural interpretation of this finding is that high interest rates today, relative to the future, could reflect tight monetary policy today and reduced future inflation associated with an overall economic slowdown.

A second unconventional series in our index is a measure of the risk premium on high-grade, short-term paper (that is, the spread between six-month high-grade commercial paper and six-month Treasury bills). This risk premium also has a natural interpretation. It provides a measure of the likelihood that on average these firms will have the future cash flow and credit stature to be able to meet these relatively short-term obligations.

Acknowledgments

This project has benefited greatly from the advice and counsel of Geoffrey H. Moore, Victor Zarnowitz, and other members of the NBER Business Cycle Dating Committee. We hope that these experimental indexes prove useful in developing improved short-term forecasts of economic conditions.

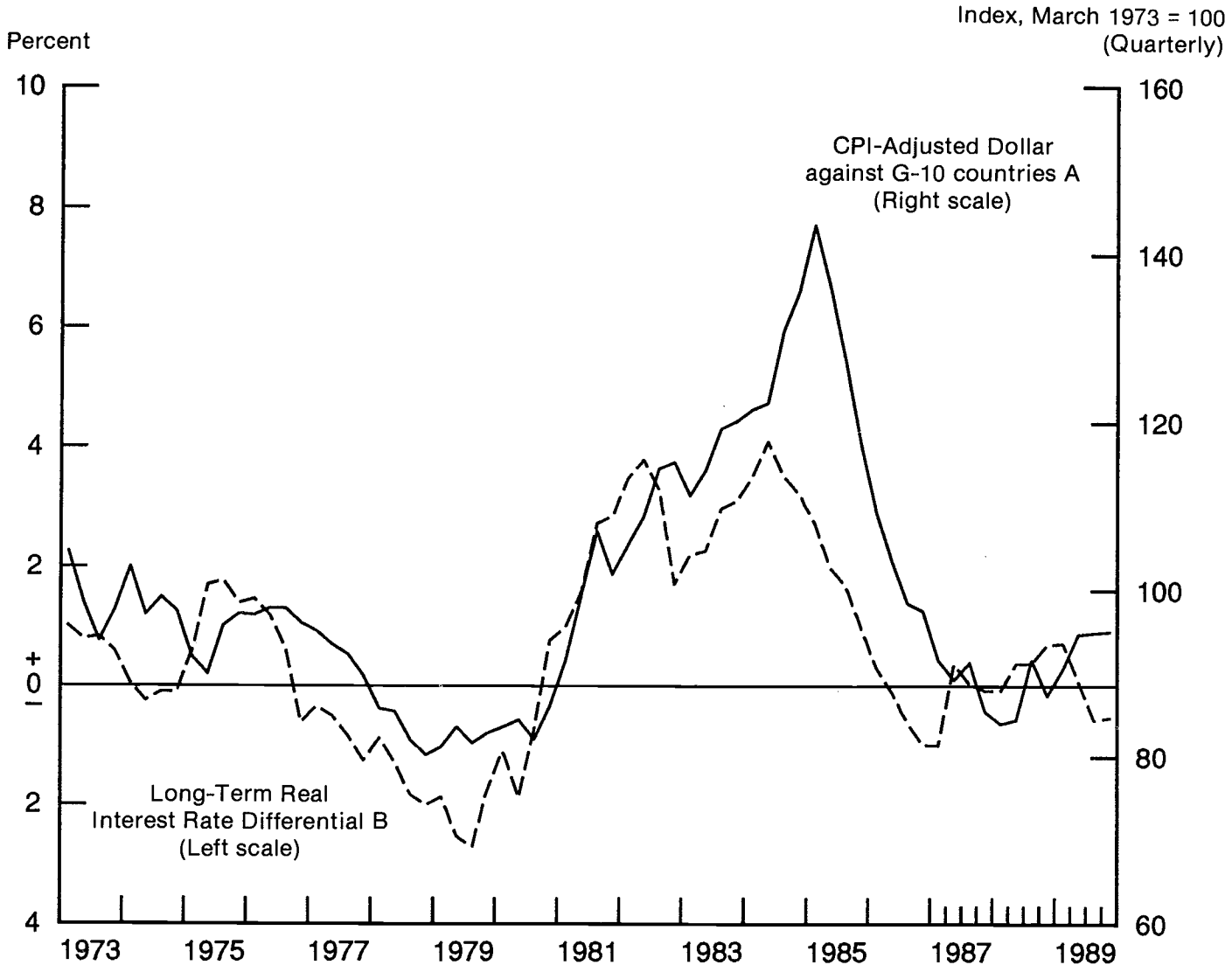
Annual Research Conference—II:

Chartists, Fundamentalists, and Trading in the Foreign Exchange Market

Jeffrey A. Frankel

The overshooting theory of exchange rates seems ideal for explaining some important aspects of the movement of the dollar in recent years. From 1981–4, for example, when real interest rates in the United States rose above those of her trading partners (presumably because of shifts in the monetary/fiscal policy mix), the dollar appreciated strongly. This episode supported the overshooting theory: the higher rates of return had made U.S. assets more attractive to international investors, which is what caused the dollar to appreciate; the appreciation continued until the dollar's value was so far above long-run equilibrium that expectations of future depreciation were enough to offset the higher nominal interest rate in the minds of international investors. (Figure 1 shows the correlation of the real interest differential with the real value of the dollar, since exchange rates began to float in 1973.)

Figure 1. The Dollar and Real Interest Rates (Quarterly Data)



A. The CPI-adjusted dollar is a weighted average index of the exchange value of the dollar against the currencies of the foreign G-10 countries plus Switzerland, where nominal exchange rates are multiplied by relative levels of CPIs. Weights are proportional to each foreign country's share in world exports plus imports from 1978 through 1983.
B. Long-term real U.S. interest rate minus weighted average of long-term real foreign-country interest rates.

SOURCES: Federal Reserve Board macro database; Peter Hooper and Catherine Mann.

Bubble Episodes

At times, however, the path of the dollar has departed from what would be expected on the basis of macroeconomic fundamentals. The most dramatic example was the period from June 1984 to February 1985. The dollar appreciated 20 percent over this interval, even though the real interest differential already had begun to fall. The other observable factors that are suggested in standard macroeconomic models—money growth rates, real growth rates, the trade deficit—also were moving in the wrong direction to explain the dollar's rise at this time.

Of course, standard observable macroeconomic variables cannot explain, much less predict, most short-term changes in the exchange rate. But what does this mean? It may be that the unexplained short-term changes are rational revisions in the market's perception of the long-run equilibrium exchange rate. These revisions are caused by shifts in "tastes and technologies," even if the shifts are not observable to macroeconomists as standard measurable fundamentals. A major difficulty with this interpretation, though, is that it is hard to believe that the world demand for U.S. goods (or U.S. productivity) could have risen enough to increase the equilibrium real exchange rate by more than 20 percent

over a nine-month period, let alone that such a shift then would be reversed over an equally short period.

The second view is that the appreciation may have been an example of a speculative bubble: that it was unrelated to fundamentals, but rather was the outcome of self-confirming market expectations. In other words, the dollar "overshot the overshooting equilibrium." This also may have been the nature of the dollar appreciation of 1988–9.

Ken Froot and I have suggested that such episodes may be examples of speculative bubbles, and that they may be described best by models in which market participants are *not* necessarily assumed to agree on the correct way to forecast the exchange rate.[1]

Trading Volume in the Foreign Exchange Market

Supporting the idea that market participants differ widely in their forecasts is the tremendous volume of foreign exchange trading. If participants all agree on their forecasts, why do they trade so much? In April 1989, foreign exchange trading (adjusted for double-counting) in the United States totaled $128.9 billion a day, an increase of 120 percent from March 1986. Simultaneous counts in London and Tokyo reported $187 billion and $115 billion a day, respectively. Thus the worldwide total is over $430 billion of foreign exchange trading a day.

Interestingly, the banks in the New York Fed Census reported that only 4.9 percent of their trading was with a nonfinancial firm; for the nonbanks, only 4.4 percent of their trading was with a nonfinancial firm. In other words, 95 percent of trading takes place among banks and other financial firms, rather than with customers (importers and exporters). Clearly, trading among themselves is a major economic activity for banks.

Why is trading volume important? It may be that the higher the liquidity of the markets, the more efficiently news regarding economic fundamentals is processed and the smaller is "unnecessary volatility" in the exchange rate. Or, the foreign exchange market already may be perfectly efficient, so that trading volume is irrelevant and uninteresting. Alternatively, trading may be based largely on "noise" rather than "news," leading to excessive volatility.

Froot and I study the British pound, German mark, Japanese yen, and Swiss franc using weekly data, and we find evidence that trading volume, exchange rate volatility, and the dispersion of expectations among forecasters are all positively related. The degree of dispersion has strong effects on the market: an increase in dispersion causes trading volume to increase in three currencies out of four and causes volatility to increase in all four currencies. We also find that the contemporaneous correlation between trading volume and volatility is high. These results may support the existence of noise trading—the causation runs from dispersion to the volume of trading, and then from trading to volatility—although there are other possible interpretations.[2]

The Rising Importance of Chartists

If traders tend to forecast by extrapolating recent trends (that is, if they have "bandwagon expectations"), then their actions will exacerbate swings in the exchange rate. The reason is that they will buy on upswings, thereby driving the price higher, and sell on downswings, forcing the price lower. Many so-called "chartist" forecasters, or technical analysts, are thought to use extrapolative rules (such as, "Buy when the one-week moving average crosses above the twelve-week moving average").

How *do* speculators form expectations? Froot and I offer evidence from market survey data that, at short horizons, respondents tend to forecast by extrapolating recent trends; at long horizons, they tend to forecast a return to a long-run equilibrium, such as purchasing power parity. Table 1 reports an update of these estimates. The coefficients reported answer the question: "For every 1 percent that the dollar appreciates in a given week, what percentage change does the median respondent forecast for the dollar thereafter?" The answer at the one-week horizon is another 0.13 percent in the same direction. At the four-week horizon, the extrapolation is smaller. Respondents expect that by the time three months have passed, the dollar will be lower than at the day when they are formulating their forecasts, and lower still at six months. One year out, they expect the dollar to be 0.33 percent lower for every 1 percent that the dollar has appreciated this week.

Which type of forecasters dominate the market: those who think short term, and appear to destabilize the

[1] *J. A. Frankel and K. A. Froot, "Understanding the U.S. Dollar in the 1980s: The Expectations of Chartists and Fundamentalists," NBER Reprint No. 957, December 1987, and "The Dollar as an Irrational Speculative Bubble," NBER Reprint No. 959, January 1988. C. M. Engel and J. D. Hamilton, "Long Swings in the Exchange Rate: Are They in the Data and Do Markets Know It?" NBER Working Paper No. 3165, November 1989, find that this is a general property of exchange rates, that there are long-term swings not adequately reflected in the forward market. D. M. Cutler, J. M. Poterba, and L. H. Summers, "Speculative Dynamics," forthcoming as an NBER Working Paper, find that this is true not only of exchange rates, but also of stocks, bonds, and commodities.*

[2] *The results are reported in J. A. Frankel and K. A. Froot, "Chartists, Fundamentalists, and Trading in the Foreign Exchange Market,"* American Economic Review, *Papers and Proceedings, forthcoming.*

Table 1. Do Forecasters Extrapolate?
OLS Regressions of Expected Future Rate of Depreciation Against Most Recent Actual Depreciation

Survey Data Source	**MMS International**		*Economist*		
Sample Period	Oct. 1984–Jan. 1988		June 1981–Aug. 1988		
Term of Forecast	1-week	4-week	3-month	6-month	12-month
Estimate of Extrapolative Parameter*	.13	.08	−.08	−.17	−.33

* Significant at 99 percent confidence level.

market by their bandwagon expectations, or those who think long term and stabilize the market by their regressive expectations? Or, if both groups are important, how do they interact?

Since Friedman, the standard argument against the importance of destabilizing speculators is that they will lose money on average and will be driven out of the market in the long run.[3] A number of special counterexamples to the Friedman argument have been constructed over the years, most involving heterogeneous actors (for example, "suckers" who lose money and "sharpies" who win).[4] The simplest counterexample would be based, not on heterogeneous actors, but on the theory of "rational speculative bubbles," in which each participant loses money if he or she *doesn't* go along with the herd. The problem with this theory is that it has nothing to say about why a bubble starts. For example, what generated a speculative bubble in the period leading up to February 1985, if that is what the dollar surge evident in Figure 1 was?

The theory of speculative bubbles that I developed with Froot says that from 1981–5, the market shifted away from the fundamentalists and toward the technical analysts or "chartists." This was a natural response to the inferior forecasting record of the fundamentalists. The change in the (weighted-average) market forecast of future movement in the value of the dollar in turn changed the demand for dollars, and therefore the price of the dollar, in the foreign exchange market.

Is any sort of evidence available for testing this theory? *Euromoney* magazine runs a yearly August review of between 10 and 27 foreign exchange forecasting services. Summary statistics from these issues are reported in Table 2, and the trend is very clear. In 1978, 18 forecasting firms described themselves as relying exclusively on economic fundamentals, and only two on technical analysis. By 1985, the positions had been reversed: only one firm reported relying exclusively on fundamentals, and 12 on technical analysis. In summary, shifts over time in the weight given to different forecasting techniques may be a source of changes in the demand for dollars, and large exchange rate movements may take place temporarily with little basis in macroeconomic fundamentals.

[3] *M. Friedman, "The Case for Flexible Exchange Rates," in* Essays in Positive Economics, *M. Friedman, ed. Chicago: University of Chicago Press, 1953.*

[4] *In J. B. De Long, A. Shleifer, L. H. Summers, and R. J. Waldmann, "The Economic Consequences of Noise Trading," NBER Working Paper 2395, October 1987, noise traders can survive and prosper, even though they trade on irrelevant information.*

Table 2. Techniques Used by Forecasting Services

Year	*No. of Services Surveyed*	*No. Using Technical Models*	*No. Using Fundamentals*	*No. Using Both Models*
1978	23	3	19	0
1981	13	1	11	0
1983	11	8	1	1
1984	13	9	0	2
1985	24	15	5	3
1986	34	20	8	4
1987	31	16	6	5
1988	31	18	7	6

* When a forecasting firm offers more than one service, each is counted separately. Some services did not indicate the nature of their technique.

SOURCE: *Euromoney*, August issues.

Economic Outlook Survey

Fourth Quarter 1989

Victor Zarnowitz

According to the December survey of 17 professional forecasters taken by the NBER and the American Statistical Association, real GNP grew 2.9 percent in 1989 and will grow 1.9 percent in 1990. Consumer price inflation will have averaged 4.8 percent in 1988–9 and will average 4.2 percent in 1989–90. Interest rates will decline moderately.

A Slowdown for 1989:4–1990:2

The median forecasts of annual growth in the economy's output for 1989:4, 1990:1, and 1990:2 are 1.0 percent, 1.8 percent, and 1.4 percent, respectively. Growth rates of 2.4 percent and 2.5 percent are expected for 1990:3 and 1990:4. Of the 80 quarterly predictions, seven (or 9 percent) are negative, including two declines of a single quarter each, one of two quarters, and one of three quarters. All of these declines are predicted through mid-1990. Only two respondents predict a full-scale recession with a duration of at least two quarters. The prevailing forecast is for a definite but short slowdown, followed by a restoration of moderate growth in the second half of the year. The gain in real GNP projected between 1989:4 and 1990:4 is 2.0 percent.

Since the last survey in September, participants have lowered their estimates of growth for 1989–90, but they still believe that a recession is unlikely. The following table shows the percentage distribution of forecasts of growth in real GNP. A comparison of percentage distributions of means calculated from the probabilistic forecasts reported by the survey participants show clearly that expectations have shifted to lower growth. The chances of a year-to-year recession, however, remain low.

Percentage Change in Real GNP, 1989–90	*September 1989*	*December 1989*
4 percent or more	6	7
2–3.9 percent	45	33
0.1–1.9 percent	39	50
Negative	10	10

Moderate Increase in the Probabilities of a Short Recession

The estimated probabilities of a recession increased for 1989:4–1990:1 but decreased for 1990:2–1990:3 since the last survey. These distributions are skewed positively; the individual assessments are highly dispersed. Still, compared with past estimates, means of 25–30 percent are fairly high.

Mean Probability of a Decline in Real GNP, 1989–90	*September 1989*	*December 1989*
1989:4	17	25
1990:1	23	30
1990:2	29	26
1990:3	29	20
1990:4	n.a.	16

Unemployment Likely to Rise Slowly

The civilian unemployment rate is forecast to average 5.4 percent in 1989:4 and 5.6 percent in both 1990:4 and 1990 as a whole. (For 1989, the civilian unemployment rate was 5.3 percent.) The range for 1990:4 is 5.0–6.4 percent; the standard deviation is 0.3 percent. These forecasts are consistent with a rather short and mild setback to macroeconomic growth, not a long or severe recession.

Inflation Forecasts Vary, but Most Expect Some Improvement

The GNP implicit price deflator (IPD) is expected to increase 4.1 percent in 1988–9 and 3.9 percent in 1989–90. Although the survey medians show only a slight reduction in inflation, two-thirds of the sample expect inflation to fall between the two years.

Percentage Change in IPD, 1989–90	*September 1989*	*December 1989*
8 percent or more	4	1
6–7.9 percent	13	6
4–5.9 percent	56	42
Less than 4 percent	27	50

The quarterly median forecasts of IPD inflation in 1989:4–1990:4 oscillate between annual rates of 3.7 percent and 4.4 percent. Few of the individual forecasts show any clear upward or downward drift.

The consumer price index (CPI) is predicted to rise on average 4.0–4.2 percent annual rate in each of the five quarters covered by the survey. The standard deviations vary between 0.5 percent and 0.7 percent. The

Projections of GNP and Other Economic Indicators, 1989–90

	Annual				
				Percent Change	
	1988 Actual	1989 Forecast	1990 Forecast	1988 to 1989	1989 to 1990
1. Gross National Product ($ billions)	4880.6	5231.0	5542.0	7.2	5.9
2. GNP Implicit Price Deflator (1982 = 100)	121.3	126.3	131.2	4.1	3.9
3. GNP in Constant Dollars (billions of 1982 dollars)	4024.4	4141.5	4218.5	2.9	1.9
4. Unemployment Rate (percent)	5.5	5.3	5.6	-0.2[1]	0.3[1]
5. Corporate Profits After Taxes ($ billions)	168.9	161.0	161.1	-4.7	0.1
6. Nonresidential Fixed Investment (billions of 1982 dollars)	493.8	513.0	527.0	3.9	2.7
7. New Private Housing Units Started (annual rate, millions)	1.5	1.4	1.4	-5.9[2]	1.4[2]
8. Change in Business Inventories (billions of 1982 dollars)	27.9	25.4	21.1	-2.5[3]	-4.2[3]
9. Treasury Bill Rate (3-month, percent)	6.7	8.1	7.4	1.4[1]	-0.8[1]
10. Consumer Price Index (annual rate)	4.1	4.8	4.2	0.7[1]	-0.6[1]

	Quarterly							
		1989	1990				Percent Change	
	1989 Q3 Actual	Q4	Q1	Q2	Q3	Q4	Q3 89 to Q3 90	Q4 89 to Q4 90
		Forecast						
1. Gross National Product ($ billions)	5273.2	5338.5	5415.0	5491.5	5583.0	5691.0	5.9	6.6
2. GNP Implicit Price Deflator (1982 = 100)	126.8	128.0	129.3	130.5	131.9	133.1	4.0	3.9
3. GNP in Constant Dollars (billions of 1982 dollars)	4158.1	4168.0	4187.0	4202.0	4227.0	4253.0	1.7	2.0
4. Unemployment Rate (percent)	5.2	5.4	5.5	5.6	5.6	5.6	0.4[1]	0.2[1]
5. Corporate Profits After Taxes ($ billions)	154.3	156.4	157.1	160.0	162.5	168.5	5.3	7.7
6. Nonresidential Fixed Investment (billions of 1982 dollars)	518.0	520.0	523.0	525.0	528.0	531.5	1.9	2.2
7. New Private Housing Units Started (annual rate, millions)	1.3	1.4	1.4	1.4	1.4	1.5	7.6[2]	8.2[2]
8. Change in Business Inventories (billions of 1982 dollars)	30.2	28.0	20.0	21.0	22.0	25.0	-8.2[3]	-3.0[3]
9. Treasury Bill Rate (3-month, percent)	7.8	7.6	7.3	7.1	7.3	7.5	-0.6[1]	-0.1[1]
10. Consumer Price Index (annual rate)	3.2	4.0	4.2	4.2	4.1	4.2	0.9[1]	0.2[1]

SOURCE: The National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, December 1989. The figures on each line are medians of seventeen individual forecasts.

[1]Change in rate, in percentage points.
[2]Possible discrepancies in percentage changes are caused by rounding.
[3]Change in billions of dollars.

range for 1990:4 is 2.9–5.2 percent; for 1990, the range is 3.5–5.0 percent.

Interest Rates Somewhat Lower in 1990 Than in 1989

The three-month Treasury bill rate is forecast to decrease from 7.6 percent in 1989:4 to 7.1 percent in 1990:2, then increase to 7.5 percent in 1990:4. The standard deviation for 1990:4 is 0.6 percent; the range is 6.5–8.2 percent. The annual medians are 8.1 percent and 7.4 percent for 1989 and 1990, with standard deviations of 0.1 percent and 0.4 percent, respectively.

The yield on new high-grade corporate bonds is expected to decline to 8.9 percent in 1989:4 and 8.7 percent in 1990:1, then to rise gradually to 8.9 percent in 1990:4. The median predictions for 1989 and 1990 are 9.3 percent and 8.9 percent; the standard deviations are 0.3 percent and 0.4 percent. All participants expect both the short and long-term interest rates to be lower on average in 1990 than in 1989.

Weaker Consumer Spending; Improved Housing Demand

Real personal consumption expenditures are predicted to have declined in 1989:4, according to the median forecast of the group. Their growth in 1988–9 is estimated at 2.7 percent; their growth in both 1989–90 and 1989:4–1990:4 is predicted to average 2.1 percent.

The forecasters expect a decline in housing starts of nearly 6 percent in 1988–9 and a rise of only 1.4 percent in 1989–90, but almost 8 percent between 1989:4 and 1990:4. The corresponding average forecasts for real residential investment are -2.1 percent for 1988–9 and 2.7 percent for both 1989–90 and 1989:4–1990:4.

Less Growth in Business Investment

Nonresidential investment in constant dollars has gained an estimated 3.9 percent in 1988–9; it is predicted to rise 2.7 percent in 1989–90 and 2.2 percent in 1989:4–1990:4. This would continue the shift from great strength (centered on producers' durable equipment) to growth rates not much higher than those of total output.

Business inventory investment still is expected to exceed $20 billion (1982 dollars) in both 1989 and 1990, not much less than in 1988, as the previous survey predicted. Thus, no major inventory cutbacks, characteristic of many past slumps, are anticipated by our respondents.

Small Gain in Industrial Production; No Further Reduction in Real Trade Deficits

Output of manufacturing, mining, and utilities, which rose strongly in 1988–9 (by about 3.4 percent) is expected to gain 0.8 percent in 1989–90 and 1.6 percent in 1989:4–1990:4. There are no significant revisions here from the previous quarter's forecast.

Net exports of goods and services were –$75 billion (1982 dollars) in 1988 and are now predicted to average about –$61 billion in both 1989 and 1990. This is a much more pessimistic forecast than that of the September survey (–$52 billion for 1989 and –$47 billion for 1990).

Some Optimism and Much Uncertainty about the Outlook for Profit

Survey correspondents estimate that corporate profits after taxes declined 4.7 percent in 1988–9 to a level of $161 billion. They are expected to show effectively no change on a year-to-year average basis in 1989–90. However, profits are predicted to gain 7.7 percent between 1989:4 and 1990:4. This median forecast would imply a partial recovery from the slide of 1988:4–1989:3, but the dispersion of the underlying individual predictions is very large (for example, for 1990:4 the interquartile range is $161–174 billion; the total range is $125–194 billion).

Cutbacks in Federal Purchases; State and Local Government Spending Steady

Federal government purchases of goods and services in constant dollars, after increasing 3 percent in 1988–9, are expected to decline 1.3 percent in 1989–90 and 1.6 percent in 1989:4–1990:4. The real purchases of state and local governments generally are seen as expanding smoothly at about 2.6 percent in 1989 and 1990.

Major Assumptions

Most forecasters foresee no significant changes in tax policy, but a few anticipate some tax increases. Most expect reductions in defense spending in the range of 1–6 percent. The reported assumptions about the growth rates in monetary aggregates M1 and M2 vary between 2 percent and 7 percent for the year ahead. Energy prices will be stable (according to seven forecasters) or rising (three of them responded). The quoted prices of oil/bbl. are $17–20. The views on the dollar remain divided. Four of the respondents assume that it will be flat or somewhat higher, while seven think it will be lower.

This report summarizes a quarterly survey of predictions by 17 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER, assisted by Robert E. Allison and Deborah A. Nicholson of NBER, was responsible for tabulating and evaluating this survey.

NBER Profiles

Jean A. Crockett

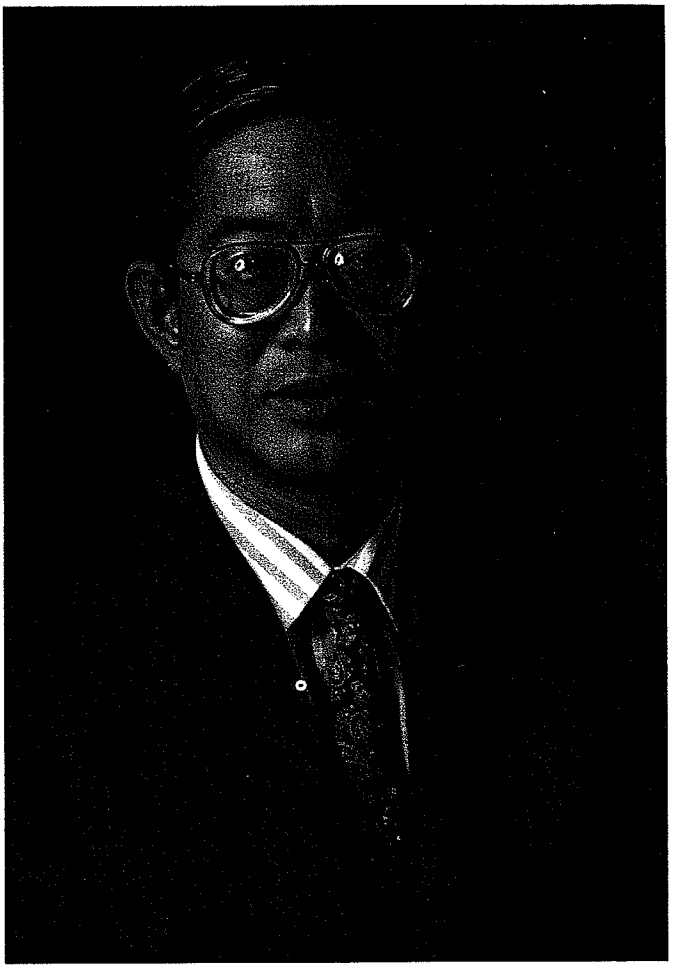
Jean A. Crockett, Emeritus Professor of Finance at the University of Pennsylvania, has been a member of the

NBER's Board of Directors since 1983. A native of Tucson, Arizona, Crockett received her undergraduate, master's, and doctoral degrees in economics from the University of Chicago, where she was associated with the Cowles Commission for Economic Research. She also holds a master's degree in mathematics from the University of Colorado.

Crockett joined the faculty of the Wharton School in 1954; she became a full professor in 1966 and was chairman of the Finance Department from 1977–82. She also is a past chairman of the Faculty Senate of the University of Pennsylvania. Crockett taught previously at the University of Illinois and was associated with the U.S. Department of Commerce in the Office of Business Economics.

Crockett has served as chairman of the directors of the Federal Reserve Bank of Philadelphia and as a member of the Consumer Advisory Council of the Federal Reserve Board. She is the author of articles and publications dealing with interest rates, consumption, saving, dividend policy, and investment.

Crockett and her husband Robert like to sail on Chesapeake Bay. She also is involved with equal opportunity issues within universities.



Robert S. Hamada

Robert S. Hamada, the Edward Eagle Brown Professor of Finance at the Graduate School of Business, University of Chicago, is a new member of the Executive Committee of the NBER's Board of Directors. He has served on the NBER's board since 1983 and has been a member of the Investment Committee since 1985.

Hamada received a B.E. in chemical engineering from Yale University, and an S.M. and Ph.D. from MIT's Sloan School of Management. He has been a member of the faculty at the University of Chicago since 1966 and has been deputy dean of the Graduate School of Business since 1985. He was also director of the Center for Research in Security Prices there from 1980–5.

Hamada has been a visiting scholar at the London Graduate School of Business Studies, the University of British Columbia, the University of Washington, and the University of California at Los Angeles.

Hamada has taught corporate finance, portfolio and securities analyses, capital markets, applications of financial theory, public finance, financing of nonprofit organizations, and problems of small business. His research focuses on the effects of risk and taxes on the financing and capital budgeting decisions within the firm; portfolio selection; the pricing of multiperiod capital assets; incidence and risk-taking effects of various taxes; and financing of nonprofit and government organizations.

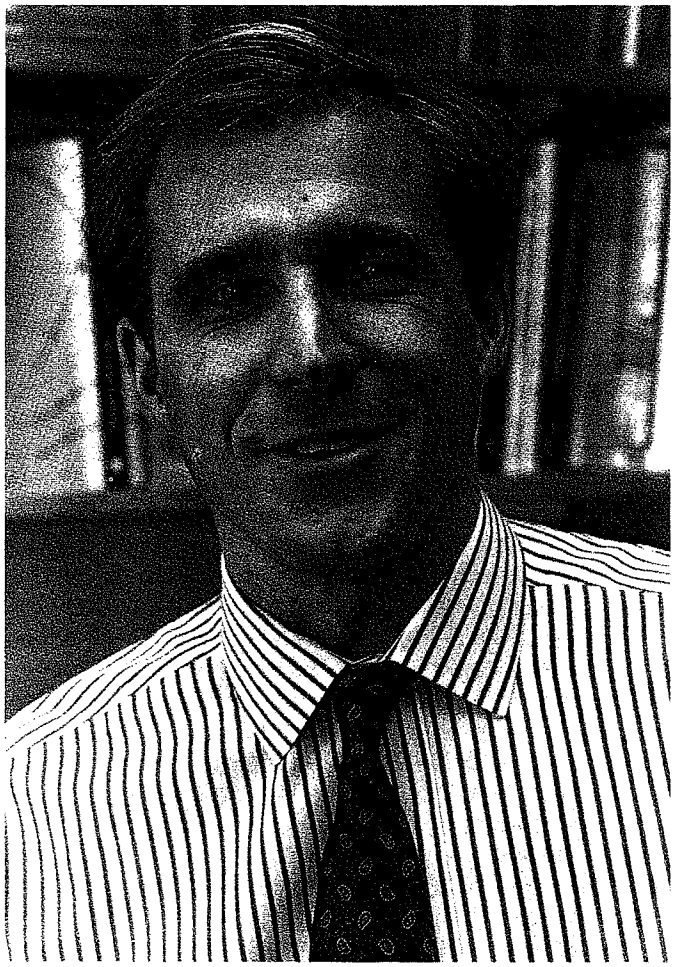
Hamada and his wife, Anne, have a daughter and a son. For the past four and a half years, his "hobby," indulged on weekends and evenings, has been "writing bureaucratic memos."

James H. Stock

James H. Stock, a research associate in the NBER's Programs in Financial Markets and Monetary Economics and Economic Fluctuations, is an associate professor of public policy at the John F. Kennedy School of Government, Harvard University. He holds a B.S. in physics from Yale University, and an M.A. in statistics and Ph.D. in economics from the University of California at Berkeley.

Stock has been at the Kennedy School since 1983 and has taught macroeconomics, econometrics, and time-series analysis. In 1986–7, Stock was a National Fellow at the Hoover Institution at Stanford University.

Stock's research has been published in a number of prominent economic journals. He also has served as an associate editor of *Econometric Theory* since 1987.



Stock and his wife, Anne, live in Watertown, MA. His hobbies are sculling, canoeing, and cross-country skiing.

Conferences

Empirical Studies of Strategic Trade Policy

A conference on Empirical Studies of Strategic Trade Policy was held in Cambridge on October 13-14. The conference, cosponsored by the NBER and the Centre for Economic Policy Research (CEPR), was organized by Paul R. Krugman, NBER and MIT, and M. Alasdair Smith, CEPR and University of Sussex. The program was:

Gernot Klepper, CEPR and Kiel Institute of World Economics, "Industrial Policy in the Transport Aircraft Industry"
Discussant: Heather Hazard, Harvard University

M. Alasdair Smith, "Modeling Trade Policy in the European Car Market"
Discussant: James A. Levinsohn, University of Michigan

Kathleen Hogan, Oracle Corporation; Kala Krishna, NBER and Harvard University; and Philip Swagel, Harvard University, "The Nonoptimality of Optimal Trade Policies: The U.S. Automobile Industry Revisited, 1979-85" (NBER Working Paper No. 3118)
Discussant: Garth Saloner, MIT

Anthony J. Venables, CEPR and Southampton University, "Trade Policy under Imperfect Competition: A Numerical Assessment"
Discussant: David Tarr, World Bank

Shantayanan Devarajan, Harvard University, and Dani Rodrik, NBER and Harvard University, "Procompetitive Effects of Trade Reform: Results from a CGE Model of Cameroon" (NBER Working Paper No. 3176)
Discussant: James R. Tybout, Georgetown University

David Ulph, CEPR and Bristol University, and L. Alan Winters, CEPR and University College of North Wales, "Strategic Manpower Policy and International Trade"
Discussant: Lawrence F. Katz, NBER and Harvard University

L. Alan Winters, "Import Surveillance as a Strategic Trade Policy"
Discussant: James Anderson, Boston College

Victor D. Norman, CEPR and Norwegian School of Economics, "Imperfect Competition and General Equilibrium Aspects of Trade"
Discussant: Drusilla Brown, Tufts University

Richard Harris, Queen's University, "Decline and Expansion in the U.S. Steel Industry, 1990-9: An Intertemporal Imperfect Competition Model"
Discussant: James Markusen, NBER and University of Western Ontario

Richard E. Baldwin, NBER, CEPR, and Columbia University, "Measurable Dynamic Gains from Trade" (NBER Working Paper No. 3147)
Discussant: Paul R. Krugman

Klepper analyzes the effects of government-supported entry and production subsidies for the Airbus on allocation and welfare. He finds that subsidized market entry without production subsidies leads to

negative welfare effects in Europe. Welfare impacts on the United States and the rest of the world depend on the market structure that might have emerged in the absence of Airbus entry. Compared to an American monopoly in the market, the entry of Airbus decreases U.S. welfare and increases welfare in the rest of the world. In general, changes in consumer surplus are dominated by profit-shifting effects. Government production subsidies paid to Airbus increase European welfare overall and increase consumer surplus in the rest of the world. There is no optimal subsidy that supports a market with two firms. Unilateral subsidization with the goal of maximizing domestic welfare will lead to a monopoly of the subsidized firm, be it Airbus or Boeing.

Smith presents a model of imperfect competition with scale economies in production. Trade restrictions that limit the shares of Japanese exporters in European markets reduce competition. The model is calibrated to fairly detailed data on sales, market structure, and scale economies. For example, the model predicts the impact of differences in sales taxes on prices.

Hogan, Krishna, and Swagel examine the sensitivity of calibration models of trade in imperfectly competitive industries to changes in specification, as well as to changes in parameters. They find that not just the magnitude but also the sign of the optimal trade policies is very sensitive to the change in model specification. Indeed, use of policies derived from the wrong model can reduce welfare. However, the welfare gains to be obtained from application of the correct model remain limited. For the present, the results of calibration models are too uncertain to support a case for activist trade policy.

Venables simulates the effects of import tariffs and export subsidies for a number of EC industries, each one calibrated to a different equilibrium concept, ranging from segmented to integrated markets, and quality to price competition. He concludes that policy is more effective in relatively concentrated industries, but the effects of policy are less sensitive to the equilibrium concept employed than might have been expected: the magnitude of welfare effects varies, but in relatively few cases do signs change. In all cases, welfare gains from trade policy are small, rarely reaching as much as 2 percent of the value of consumption.

How likely is trade liberalization to produce efficiency gains in the presence of imperfect competition, scale economies, and higher-than-average wages in the modern sectors, all common features of *developing* economies? These features create a potential conflict in that traditional notions of comparative advantage would lead us to expect that the modern sectors will be squeezed with the removal of trade barriers. Devarajan and Rodrik investigate the issue by using an applied general equilibrium model calibrated to data from Cameroon. When the model is run under perfect competition, the traditional expectations are borne out: on the whole, manufacturing sectors contract, and the cash crops sector (mainly coffee and cocoa) is the main beneficiary; the welfare effect is a wash, since the beneficial consequence of expanded imports is offset by labor being pulled away from the modern, high-wage sectors. By contrast, when the model is run under imperfect competition (in the modern sectors only), trade liberalization produces welfare gains of the order of 1–2 percent of real income. The key in the latter result is the procompetitive effect of liberalization: domestic firms now perceive themselves as facing a higher elasticity of demand, which spurs them to increase production. Therefore, the modern sectors do much better in terms of output than in the perfectly competitive benchmark. Devarajan and Rodrik conclude that under reasonable circumstances imperfect competition will make liberalization *more* desirable, even in the absence of firm entry and exit.

Ulph and Winters argue that the success of strategic trade and industrial policies directed at the high tech sector depends crucially on factors such as the mobility of key scientific personnel. Conversely, arguments about the importance of developing policies to confront manpower problems, such as skill shortages and "brain drains," are understood best in the framework of strategic trade policy. They show that, provided there is some degree of international mobility of scientific personnel, policies designed to support the high tech sector and encourage the demand for scientific manpower will be beneficial. Such policies appear to be very powerful potentially. In this context, policies aimed at encouraging the supply of scientific manpower are positively harmful. However, if R and D labs move to where the scientific manpower is concentrated, the success of policies to support the high tech sector depends on having a sufficient supply of scientific manpower. Ulph and Winters show that the degree of mobility of both manpower and of R and D labs is both significant and growing.

Winters examines the effects of import surveillance on the quantities and prices of imports to the EC. Import surveillance imposes no formal barrier to trade; hence, if it affects imports, it does so for strategic reasons—firms changing their behavior in order to influence the probability that the importing government will impose formal restrictions at a later stage. The incentives for firms to change their behavior depend on what subsequent policies they fear and their ability to do so depends on industry characteristics. Surveillance is most likely to cut imports for sophisticated goods, from concentrated industries, from countries with strong traditions of activist industrial policy, and when surveillance affects imports for only one or two countries. The results, while rather imprecise, are quite consistent with these predictions. Winters concludes that import surveillance typically cuts imports and thus that there is evidence in this simple case of firms' strategic behavior.

Norman analyzes the logical interaction between imperfect competition and general equilibrium. First he examines how international oligopoly can dampen the exploitation of comparative advantage. He then

discusses how strategic trade policy can be affected by general-equilibrium (GE) repercussions. Norman shows that the incentives to obtain a first-mover advantage could depend critically on GE repercussions.

Harris examines trade and industrial policy in the U.S. steel industry. He emphasizes competition between integrated U.S. steel producers and producers using the mini-mill technology. Efforts to promote or inhibit old versus new technology are at the center of the model. Harris considers relaxation or tightening of the voluntary restraint agreements, cartelization of the industry, and production subsidies. While free trade is a global optimum, the status quo trade policy closely approximates the second-best optimum.

Productive factors, such as human and physical capital, are accumulated and trade can affect the steady-state levels of such factors. Consequently, trade liberalization will have dynamic effects on output and welfare as the economy moves to its new steady state, in addition to its usual static effects. Baldwin confirms that the output impact of this dynamic effect is measurable and quite large. The welfare impact of this dynamic effect is also measurable. The size of this dynamic gain from trade depends on the importance of external scale economies.

Also attending the conference were: Geoffrey Carliner, NBER; Martin Feldstein, NBER and Harvard University; Robert Stern, University of Michigan and Brandeis University; and Stephen Yeo, CEPR.

Reducing the Risk of Economic Crisis

Over 40 economists and policymakers met in Cambridge on October 17 for an NBER conference on "Reducing the Risk of Economic Crisis." NBER President Martin Feldstein, also of Harvard University, organized the following program:

Background Paper: Benjamin M. Friedman, NBER and Harvard University, "The Risks of Financial Crises"

Prepared Remarks: Joseph Grundfest, Securities and Exchange Commission; Irvine Sprague, former chairman, Federal Deposit Insurance Corporation; and Norman Strunk, former president, United States League of Savings Institutions

Background Paper: Lawrence H. Summers, NBER and Harvard University, "Macroeconomic Consequences of Financial Crises"

Prepared Remarks: Hyman Minsky, Washington University; William Poole, NBER and Brown University; Paul A. Samuelson, MIT; and Paul A. Volcker, former chairman, Federal Reserve Board of Governors

Background Paper: Paul R. Krugman, NBER and MIT, "International Aspects of Financial Crisis"

Prepared Remarks: C. Fred Bergsten, Institute for International Economics; Rudiger Dornbusch, NBER and MIT; Jacob A. Frenkel, NBER, University of Chicago, and International Monetary Fund; and Charles Kindleberger, MIT

In the session on the risks of financial crises, Grundfest discussed sharp declines in equity prices that were followed by a quick rebound in those prices. He suggested that the market searches for the new equilibrium level of prices after some initial shock, and that these downturns cannot be eliminated without imposing costs that are greater than any possible benefits. Sprague argued that there were "two hazards in seeking any change" in the current regulatory environment for financial institutions: the president and the Congress. He believes that recent legislation concerning financial institutions, including the savings and loan bailout bill, had been adversely affected by political considerations. Thus, if at all possible, the best approach is to avoid future regulatory change. Strunk analyzed the failures of savings and loans in the 1980s, emphasizing inadequate supervision both in terms of the legal authority granted to the Federal Home Loan Bank Board and in the weakness of its supervisory and examination staff. However, he believes that improving this supervision is the most effective way to avoid similar problems in the future. Substantive changes in deposit insurance are not politically feasible, he feels.

In the discussion of the macroeconomic consequences of financial crises, Minsky reviewed his hypothesis of financial instability. His model focuses on the behavior of businessmen and bankers in explaining the relationship between asset values and investment, and thus between financial and economic crises. Poole then explained that the government is not well prepared for potential crises. Thus, damaging precedents for financial markets are set by accident. He proposed changes in the tax system to stop encouraging debt accumulation by people and corporations, and reforms in the deposit insurance system. Samuelson discussed the widespread opinion, after the 1987 stock market crash, that no recession was imminent, and contrasted that belief with earlier views that financial crises trigger economic collapse. He believes that stock market crashes used to have a much greater ability to trigger bank failures, and thus broader economic problems, than they do now. Further, he contends, economists wrongly attributed some business cycles, including the Great Depression, to stock market declines. Volcker reviewed the U.S. experience since 1970 in responding to financial crises. By using the policy tools repeatedly and aggressively to prevent crises, do policymakers end up reinforcing the behavior patterns that aggravate the risk in the first place? He concludes that the core of the banking system must be protected from financial collapse, but everyone in the financial system cannot be protected.

Bergsten explored the possibility of a "hard landing" for the U.S. economy. In that case, an economic crisis could be triggered by foreign investors suddenly de-

ciding to curtail their dollar investments. He argued that the risk of such a scenario remains acute, and that the best way to prevent it would be to eliminate the U.S. current account deficit. Dornbusch considered the Latin American experience in the aftermath of major macroeconomic shocks, during which huge capital outflows sharply lowered the value of the currency. He believes that there may be no politically feasible policies that can reverse the capital flows in such situations. Frenkel evaluated the institutional structure of international policymaking, and how it affects the response to potential and actual financial crises. In particular, there are several obstacles to international economic coordination. Frenkel argued that while international "cooperation" is a worthy goal, true coordination is not a practical possibility. Kindleberger emphasized that many theorists focus on one mechanism for the international propagation of financial crises, but there are actually many whose importance changes over time.

The background papers, prepared remarks, a summary of the discussion prepared by Douglas Elmendorf, Harvard University, and an introduction by Martin Feldstein will be published as an NBER conference volume.

The United States and Japan: Trade and Investment

NBER Research Associate Paul R. Krugman, also of MIT, organized a conference on "The United States and Japan: Trade and Investment" in Cambridge on October 19-20. The program was:

Robert Z. Lawrence, The Brookings Institution, "How Open Is Japan?"
Discussants: Gary Saxonhouse, University of Michigan, and Marcus Noland, Institute for International Economics

Peter Petri, Brandeis University, "Japanese Trade in Transition: Hypothesis and Recent Evidence"
Discussants: Dan Citrin, International Monetary Fund, and Dennis Encarnation, Harvard University

Won Am Park, Korea Development Institute, and Yung Chul Park, Korea University, "Changing Japanese Trade Patterns and the East Asian NICs"
Discussants: Alice Amsden, New School for Social Research and MIT, and Stephan Haggard, Harvard University

Richard C. Marston, NBER and University of Pennsylvania, "Price Behavior in Japanese and U.S. Manufacturing"
Discussants: Catherine L. Mann, Federal Reserve Board, and Bonnie Loopesko, Federal Reserve Bank of New York

Masahiro Okuno-Fujiwara, University of Tokyo, "Industrial Policy in Japan: A Political Economy View"
Discussants: Laura Tyson, Harvard University, and Edward M. Graham, Duke University

David M. Meerschwam, Harvard University, "The Japanese Financial System and the Cost of Capital"
Discussants: Koichi Hamada, NBER and Yale University, and Robert Feldman, Salomon Brothers

Jeffrey A. Frankel, NBER and Harvard University, "Japanese Finance: A Survey" (NBER Working Paper No. 3156)
Discussant: Robert Dekle, Boston University

Takatoshi Ito, NBER, University of Minnesota, and Hitotsubashi University, and Masayoshi Maruyama, Kobe University, "Is the Japanese Distribution System Really Inefficient?"

Motoshige Itoh, University of Tokyo, "The Japanese Distribution System and Access to the Japanese Market"
Discussant for Ito/Maruyama and Itoh papers: David Flath, North Carolina State University

Amelia Porges, Office of the U.S. Trade Representative, "U.S.-Japan Trade Negotiations"
Discussants: David Yoffie, Harvard University, and Paul R. Krugman

Lawrence points out that Japanese manufacturers charge higher prices for the goods they sell in Japan than for the goods they sell in the rest of the world. In 1987, for example, goods prices in Japan were 87 percent higher than in the United States. Even many *imported* products in Japan are subject to unusually high markups. Still, there has been a dramatic increase in the volume of manufactured goods imports into Japan over the past four years. It appears that the share of Japanese imports accounted for by the intrafirm shipments of Japanese-owned firms abroad has been declining. On the other hand, the intrafirm shipments of U.S. firms have been a growing share of U.S. exports to Japan. Lawrence concludes that the Japanese market is not open, but it is responding to price changes and sectorial negotiations.

How has *endaka,* the sharp appreciation of the yen, affected Japanese trade? Petri finds that aggregate Japanese imports of manufactures are now 10 to 20 percent higher than predicted by pre-1985 relationships and are more sensitive to economic determinants than they were before 1985. Japan imports relatively little of products that require intensive distribution and of products purchased primarily by business and government (as opposed to households). With respect to the partner composition of Japanese trade, Petri finds little evidence so far for the emergence of a "yen bloc" in East Asia. Strong consumer goods imports since 1985 have fueled a surge of trade with the East Asian newly industrialized countries (NICs) and Europe, but Japan is less important as a trade partner to the NICs today than it was in 1975. Overall, Petri finds modest increases in Japan's openness to trade.

Park and Park analyze changes in patterns of trade among the United States, Japan, and the East Asian NICs. For the past four years, the East Asian NICs have been very successful in exporting to Japan manufactured products that are intensive not only in labor but also in human capital and technology. Japan's foreign direct investment in the East Asian NICs has risen markedly in recent years, but it is still too small to have brought about any significant changes in the pattern of trade between Japan and the NICs. Park and Park show that the NICs have beome more dependent on Japan as the major source for their imports of technology, capital, and intermediate inputs. The NICs have increased their market shares in all categories of manufactures in the United States. The triangular trade structure involving the United States, Japan, and the NICs has become more rigid than before.

Marston argues that relative price changes in Japanese and U.S. manufacturing are driven by two forces: productivity growth, which leads to secular changes in costs; and exchange rate fluctuations, which change relative prices between the two countries. In sectors in which productivity growth is high, reductions in costs can neutralize exchange rate appreciations in the long run so as to keep prices competitive with those abroad. But even in these sectors, exchange rate fluctuations are the dominant influence on relative competitiveness in the short run. Faced with swings in exchange rates, firms adopt measures to defend their export markets. Marston estimates that firms lower their export prices in domestic currency relative to their domestic prices in order to limit the effects of currency appreciation. Both the United States and Japan price to market, but it is more extensive in Japan. In response to a currency appreciation, Japanese firms sharply reduce their export prices in domestic currency so as to limit the pass-through of the appreciation into the dollar prices of their exports.

Okuno-Fujiwara argues that Japanese industrial policy does not play a critical role in strategically restructuring the Japanese economy or in forming government-industry cartels. Historically, Japanese industrial policy has shifted its emphasis from hard to soft measures and from strategic to corrective policies. Although many contemporary policies still appear to be strategic, they pose little threat to foreign competitors. The problem of market access to Japan seems to persist, however. It stems not from the strategic design of industrial policies but rather from the insider nature of the policy choice and from policy implementations in general in Japan.

Meerschwam argues that a carefully balanced system of dependencies, market segmentation, limited financial product alternatives, and price regulation allowed a rationed capital market to operate in Japan in 1950–73. In this system, certain borrowers had preferential access. Meerschwam also argues that the current forces for price and product deregulation in the Japanese financial system have jeopardized the traditional relationships that had been central in the system. However, the deregulation of the 1980s was not a response to foreign pressures. Instead, a domestic fiscal policy shift had caused the established dependencies and power relationships to break, as Japan faced slower growth and the need for government funding exploded in the wake of the oil shock. The overall capital flows out of Japan now should be seen primarily as a result of the basic savings imbalance in the country, rather than as the result of some capital cost advantage for selected firms.

According to Frankel, observers of Japanese financial markets wonder about the apparently low corporate cost of capital, low real interest rates, high equity prices, high land prices, and the rising real yen. Surveying the literature on Japan, Frankel concludes that: 1) the real interest rate in Japan may remain below that in the United States, despite international arbitrage; 2) the main effect of the opening of Japanese financial markets may have been to accelerate the process whereby corporate finance becomes market oriented; 3) affiliated firms are losing the special privilege of borrowing at a cheaper rate; 4) unaffiliated firms are able to borrow more cheaply than before; and 5) the increased availability of funds for asset-market arbitrage allowed the great run-up in equity and land prices in the 1980s.

Ito and Maruyama investigate the allegation that Japan's distribution system is characterized by excessively small-scale enterprises, multiple layers of wholesalers, and vertical restraints, and that its inefficiency leads to high prices to consumers. They find that the Japanese distribution system does contain a large number of small firms and a uniquely high complexity of wholesale transactions. Surprisingly, however, there is little evidence of inefficiency; while establishments are small, sales and value added per worker are comparable to those in other industrial nations, and the markup of retail prices over producer prices is similar to that in other countries. These results call into question the common view that high consumer prices in Japan can be attributed to the distribution system.

Itoh also suggests that the Japanese distribution system is characterized by a proliferation of small enterprises and successive layers of wholesalers; it also is marked by seemingly noncompetitive practices among producers, wholesalers, and retailers. However, the large number of neighborhood general-purpose stores, for example, is related to present and historical differences between Japanese consumers and those in other countries. Other aspects of the distribution system represent rational implicit contracts between firms that plan to be in long-term relationships—for example, a policy of costless return of unsold products coupled with resale price maintenance can serve as a quality guarantee mechanism. Thus, Japanese practices that appear inefficient by U.S. standards actually may be efficient, given imperfect information.

Porges suggests that trade negotiations between the United States and Japan are complicated by essential structural differences in the two countries' policymaking processes. U.S. trade policies emerge from

consultation among a number of different parties, with conflict both between the legislative and executive branches and within the executive branch; they generally respond to initiatives from the private sector, rather than being self-initiated by the government. When trade policies finally are decided upon, the commitments tend to be meaningful. Japanese trade policies increasingly are made by "tribes" within the legislature and their allies within the bureaucracy; the Japanese government also has weak formal powers. As a result, U.S. demands often meet stubborn resistance. Even when agreement is reached on paper, the Japanese implementation may disappoint the U.S. negotiators.

Also attending the conference were: Geoffrey Carliner, NBER; Martin Feldstein, NBER and Harvard University; Kenneth A. Froot, NBER and MIT; Peter Hooper, Federal Reserve Board; and Hugh Patrick, Columbia University.

International Economic Research and Measurement

Over 200 people attended an NBER-CRIW (Conference on Research in Income and Wealth) conference on international economic research and measurement in Washington, DC on November 3-4. Organized by CRIW members Peter Hooper, Federal Reserve Board, and J. David Richardson, NBER and the University of Wisconsin at Madison, the conference dealt with the quality and usefulness of international economic data. The program was:

Keith E. Maskus, University of Colorado at Boulder, "Comparing International Trade Data and Product and National Characteristics Data for the Analysis of Trade Models"

Comments: Edward E. Leamer, NBER and University of California at Los Angeles

Ellen Meade, Federal Reserve Board, "Computers and the Trade Deficit: The Case of the Falling Prices"

Comments: Richard D. Haas, International Monetary Fund

Bruce Walter, Bureau of the Census, "Quality Issues Affecting the Compilation of the U.S. Merchandise Trade Statistics"

Comments: David Klock, U.S. Department of the Treasury

William Alterman, Bureau of Labor Statistics, "Price Trends in U.S. Trade: New Data, New Insights,"

Comments: Richard C. Marston, NBER and University of Pennsylvania

Irving B. Kravis, NBER and University of Pennsylvania; Robert E. Lipsey, NBER, Queens College, and City University of New York; and Linda Molinari, City University of New York, "Measures of Prices and Price Competitiveness in International Trade in Manufactured Goods"

Comments: Catherine L. Mann, Federal Reserve Board

Bernard Ascher, Office of the U.S. Trade Representative, and Obie G. Whichard, Bureau for Economic Analysis, "Developing a Data System for International Trade in Services: Progress, Problems, and Prospects"

Comments: Rachel McCulloch, NBER and Brandeis University

Bernard H. Hoekman, General Agreement on Tariffs and Trade, and Robert M. Stern, University of Michigan and Brandeis University, "Evolving Patterns of Trade and Investment in Services"

Comments: Samuel Pizer

Robert Z. Lawrence, The Brookings Institution, "Issues in Measurement and International Comparison of Productivity in Manufacturing"

Comments: Barry J. Eichengreen, NBER and University of California at Berkeley

John F. Helliwell, NBER and University of British Columbia, and Alan Chung, University of British Columbia, "The Macroeconomics of Convergence: International Transmission of Growth and Technical Progress"

Comments: Martin Neil Baily, NBER, University of Maryland, and The Brookings Institution

Irving B. Kravis and Robert E. Lipsey, "International Comparison Program: Current Status and Problems"

Comments: Alan V. Deardorff, University of Michigan

Harry Grubert, U.S. Department of the Treasury, and John Mutti, Grinnell College, "Alternative Measures of U.S.-Canadian Investment and Trade in the Analysis of Taxes."

Lois Stekler and Guy V. G. Stevens, Federal Reserve Board, "The Adequacy of U.S. Direct Investment Data"

Comments: Betty Barker, Bureau of Economic Analysis, and Edward M. Graham, Duke University

"Issues in Measurement and Empirical Research" Panelists: Robert E. Baldwin, NBER and University of Wisconsin at Madison; Jack J. Bame, Bureau of Economic Analysis; and Ralph C. Bryant, The Brookings Institution

Maskus illustrates the capabilities and problems of data used in estimating models of production and international trade based on national factor endowments. He concludes, among other things, that measures of relative factor shares are not cyclically sensitive, whereas measures of factor productivity are. He demonstrates the value of data improvements, such as standardized concordances; mutually consistent price deflators for inputs, outputs, and trade; and breakdowns of sectorial labor inputs by occupational groups.

Meade compares the price indexes for U.S. exports and imports of computers that have been constructed by the Bureau of Economic Analysis (BEA) with those from the Bureau of Labor Statistics (BLS). Using the BEA's hedonic price index, rather than the BLS price index that is based on unit values, has had a significant impact on aggregate export and import deflators, and hence on corresponding measures of aggregate trade volume. Meade also finds that, on any measure, price and quantity movements in the computer sector have been sufficiently atypical that the sector should be isolated from the aggregate of other sectors when attempting to forecast trade.

Walter summarizes recent efforts by the Census Bureau and Customs Service to improve the quality of U.S. merchandise trade statistics: reducing lags (carryover) in the recording of monthly data; port audits and reconciliation exercises with Canada and other trading partners; development of constant-dollar equivalents for monthly exports and imports; and capacities for recording state of origin, destination, and whether a given transaction was intracorporate. Walter also discusses the potential value of increasing automation in collecting trade data.

Alterman documents the ongoing development of the true export and import price indexes at the BLS and illustrates how different they are from the unit values that they recently replaced. For example, he calculates a 1985 dollar-deflated "real" U.S. trade deficit of $98.8 billion for 1989's second quarter using the true indexes, but a deficit of $128.4 billion using unit values! Alterman also finds that firms pass most of a depreciation of their own currency through to the prices they charge, but less of any appreciation. Moreover, foreign firms may be more reluctant than U.S. firms to accept losses of price competitiveness caused by currency appreciation.

Kravis, Lipsey, and Molinari use disaggregated national price indexes for traded manufactures to construct indexes of price competitiveness for the United States, Germany, and Japan: one for each country vis-à-vis a weighted aggregate of its major competitors, and one for developed country exports relative to developing countries. They adjust these indexes for differential quality change and use wholesale price indexes and hedonic price indexes to fill gaps. To estimate prices that are missing entirely, they fit a regression equation with country- and commodity-specific dummy variables to a block of countries and commodities. This allows *all* the data to establish the coefficients that can be used to form the "best-bet" prediction of the missing prices.

Ascher and Whichard describe recent U.S. government efforts to develop data on international trade in services. They document: 1) the surveys and imputations that underlie recent significant extensions to measures of cross-border trade in a wide variety of services; and 2) the measurement of within-country or "establishment" transactions between firms owned by residents of different countries.

Hoekman and Stern evaluate both international trade and direct investment in various services with data for several years and countries. They find that developing countries are gaining world export shares in shipping, travel, and passenger services. Trade in financial and business services remains a fairly stable and exclusive turf for developed countries. Similarly, until very recently, most foreign direct investment (FDI) in services was between developed countries. Furthermore, FDI in services has been growing faster than FDI in manufacturing; because of higher trade barriers, it is larger relative to trade flows than FDI in manufacturing.

Lawrence finds that the lack of price deflators for imported inputs between 1982 and 1985, and the use of domestic counterparts instead, overstated manufacturing growth by 2 to 3 percent. However, he concludes that by 1987 relative prices had moved enough to completely offset the bias. He also documents the dramatic cross-industry dispersion of measured growth rates, appealing again to computers as the most striking outlier, and speculates that international comparisons can be made meaningful only for manufacturing subaggregates.

Helliwell and Chung study international transactions in technology, using national real GDP attributable to each worker as a primary proxy for technology. In a sample of 19 industrial countries, they find evidence of convergence in rates of growth of technology since 1960. They attribute a portion of the explanatory power in their regressions to rapid growth in the ratio of trade to GDP. They also find that measuring capital as the private fixed stock of business capital gives the clearest results; to include residential capital, public capital, or inventories clouds the interpretations.

Kravis and Lipsey report on the history, purpose, and current status of the International Comparisons Program, aimed at correcting for relative price differences across countries in the measurement of comparative levels of national output. They calculate a "range of uncertainty" for GDP and subaggregates, estimated to be as high as 20–25 percent for lower-income countries.

Grubert and Mutti show how alternative calculations of effective corporate tax rates in Canada and the United States explain real capital formation and how it is financed by U.S. direct investors in Canadian manufacturing. They find that taxes have a significant influence on real capital formation, but not necessarily on the financial flows that are the most common measure of direct foreign investment. They also find that U.S. multinational firms account for almost all the responsiveness of aggregate Canadian real manufacturing investment to tax rates.

Stekler and Stevens review the history of U.S. data collection on inward and outward direct foreign investment. They suggest: 1) the creation of alternative measures, based on different degrees and conceptions of "control"; 2) collection of data from parents of foreign investors in the United States to match categories on U.S. parents of affiliates abroad; and 3) the use of the

Census of Manufactures to collect data on domestic and foreign affiliates on an establishment basis.

The concluding panelists generally commended the timeliness of the efforts to blend perspectives on data and research in trade, services, and direct investment. Bame observed, and Bryant seconded, the need for future consideration of data on international *financial* transactions as well. Bryant further observed that data on international transactions are international public goods, and that international collaboration on the content of the conference would be highly desirable. Baldwin observed how changing technologies and types of goods traded may make the idea of measuring at the "border" less relevant, and the idea of sampling firms in some randomly representative way the wave of the future.

Tax Policy and the Economy

Over 100 members of the business, government, and legal communities attended the NBER's fourth annual conference on Tax Policy and the Economy in Washington, DC on November 14. The conference was organized by NBER Research Associate Lawrence H. Summers of Harvard University. The program was:

Daniel R. Feenberg, NBER, and Lawrence H. Summers, "Who Benefits from Capital Gains Reductions?"

Alan J. Auerbach, NBER and University of Pennsylvania, and Laurence J. Kotlikoff, NBER and Boston University, "Demographics, Fiscal Policy, and U.S. Savings in the 1980s and Beyond" (NBER Working Paper No. 3150)

Lawrence H. Goulder, NBER and Stanford University, "Implications of Introducing U.S. Withholding Taxes on Foreigners' Interest Income"

Mark Gertler, NBER and University of Wisconsin, and R. Glenn Hubbard, NBER and Columbia University, "Taxation, Corporate Capital Structure, and Financial Distress"

Eytan Sheshinski, Hebrew University and Columbia University, "Treatment of Capital Income in Recent Tax Reforms and the Cost of Capital in Industrialized Countries"

Feenberg and Summers examine the distribution of the benefits associated with reductions in capital gains taxes. They consider four plans for reducing capital gains taxes: excluding a fixed fraction of capital gains from taxable income; taxing real rather than nominal gains; using a sliding scale for capital gains exclusion; and a combination of indexation and exclusion. They find important differences in the distributional consequences of the different approaches to reducing taxes on capital gains. Indexation yields greater benefits than a general exclusion of capital gains to lower-income taxpayers, because they typically hold assets longer before selling them, and because they typically enjoy smaller gains than higher-income taxpayers. Indexation also favors real estate over corporate stocks to a much greater extent than a general exclusion does. A sliding-scale capital gains tax cut, based on the amount of time an asset is held, has distributional consequences that are very similar to a general exclusion.

Demographic change may alter our rate of national saving and our current account position significantly over the next 50 years. The gradual aging of the population is predicted to lead to higher saving rates over the next three decades with declines thereafter. An improvement in the U.S. current account position also is predicted for the 1990s, with a very gradual deterioration during the subsequent decades. However, Auerbach and Kotlikoff find that demographics do not explain the drop in the U.S. saving rate in the 1980s. Indeed, based on demographics alone, predicted saving rates would have been high and roughly equal in the 1950s and 1980s and considerably lower in the 1960s and 1970s.

Goulder explores the efficiency and equity effects of introducing a withholding tax on foreigners' income from their investments in the United States. A statutory 10 percent U.S. withholding tax on portfolio interest, if not accompanied by similar (retaliatory) tax measures introduced by foreign governments, should increase domestic welfare.

If foreign governments respond in kind to a U.S. withholding tax initiative, the combined effect is a decline in U.S. residents' aggregate welfare. The equity arguments for the withholding tax are mixed. Restricting the tax to investors from countries with similar measures may be more fair than applying it to all foreign investors. One attraction of the tax is its ability to discourage capital flight to the United States and related tax evasion; however, other policies with less serious efficiency costs might be equally effective in addressing tax evasion problems.

Is corporate leverage "too high"? Gertler and Hubbard argue that, when common as well as idiosyncratic disturbances are important to firm profitability, the optimal financial arrangement involves a mixture of debt and equity. The arrangement is equivalent to one with debt and provisions for adjustment of the principal in response to industrywide or economywide disturbances. The idea is to have outside lenders share the systemic risks in order to ensure the firm's financial position, and therefore its creditworthiness, against fluctuations in general business conditions.

But distortions contributed by the tax system may create excessive leverage. In particular, the authorities who define debt for tax purposes make it difficult to index against common risks. This introduces an impor-

tant trade-off in the capital structure decision: the benefits of the expected tax subsidy from additional debt versus the costs of having reduced flexibility in adjusting obligations to creditors in the event of an industry-wide or economywide recession.

Sheshinski surveys the major trends in tax reforms in industrial countries, particularly in relation to the taxation of income from capital interest, dividends, and capital gains. While reforms concerning the tax treatment of earnings commonly reduced marginal rates, particularly the top rates, and broadened the tax base, there has been no such tendency with regard to the taxation of income from capital. In all countries except the United States, interest income and, to a lesser extent, dividends are taxed at favorably low rates and long-term capital gains as a rule are exempt. Further, capital income has not been indexed to changes in the price level. As a consequence, the presence of high and variable inflation rates has caused major distortions in capital markets.

The MIT Press will publish these papers in *Tax Policy and the Economy 1990*, Volume 4, edited by Summers. Its availability will be announced in a future issue of the *NBER Reporter*.

Conference Calendar

Each *NBER Reporter* includes a calendar of upcoming conferences and other meetings that are of interest to large numbers of economists (especially in academia) or to smaller groups of economists concentrated in certain fields (such as labor, taxation, finance). The calendar is primarily intended to assist those who plan conferences and meetings, to avoid conflicts. **All activities listed should be considered to be "by invitation only," except where indicated otherwise in footnotes.**

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Spring 1990 issue of the *Reporter* is March 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

February 15-17, 1990
First Annual U.S.-Japan Economic Forum, NBER

February 23-24, 1990
Firms and Industry Dynamics, NBER

February 27-28, 1990
Policy Seminar, National Association of Business Economists*

March 1, 1990
The Impact of 1992 on European Trade and Industry, Center for Economic Policy Research

March 9-10, 1990
5th Annual Macroeconomics Conference, NBER

March 16-17, 1990
Conference on Trade, NBER

March 16-17, 1990
3rd Annual InterAmerican Seminar on Economics, NBER

March 17-23, 1990
International Atlantic Economic Conference, Atlantic Economic Association*

March 22-23, 1990
Conference on Research in Income and Wealth: Price Measurement, NBER

March 22-24, 1990
Conference on Financial Crisis, NBER

March 29-31, 1990
Annual Meeting, Midwest Economics Association*

March 30, 1990
Program Meeting: Labor Studies, NBER

April 5-6, 1990
Panel on Economic Activity, Brookings Institution

April 5-7, 1990
Conference on Aging, NBER

April 5-7, 1990
1990 Annual Meeting, Eastern Finance Association*

April 12-13, 1990
Higher Education, NBER

April 12-14, 1990
Conference on Economic Growth, NBER

April 19-20, 1990
Program Meeting: Taxation, NBER

April 20-21, 1990
Carnegie-Rochester Public Policy Conference, Carnegie-Mellon University—University of Rochester

April 27, 1990
Macroeconomic History, NBER

May 1, 1990
Macroeconomic Policy and the External Constraint, Center for Economic Policy Research

**Open conference, subject to rules of the sponsoring organization.*

May 4-5, 1990
Conference on Research in Income and Wealth: Measurement Issues in the Service Sector, NBER

May 11-12, 1990
Universities Research Conference: Asset Pricing and Financial Markets, NBER

May 14-15, 1990
Politics and Economics in the Eighties, NBER

May 14-15, 1990
Regulating International Financial Markets, Columbia (with MOF, FAIR)*

May 18-19, 1990
Conference on Populist Economics in Latin America, NBER

May 21-22, 1990
Spring Symposium, National Tax Associatiation-Tax Institute of America*

June 3-5, 1990
Biennial Meeting, International J. A. Schumpeter Society*

June 14-16, 1990
Economic Policy in Political Equilibrium, Center for Economic Policy Research

June 14-16, 1990
The Political Economy of Tax Reforms, NBER

June 19-20, 1990
International Seminar on Macroeconomics, NBER

June 19-21, 1990
1990 12th Annual International Conference, International Association for Energy Economics*

June 25-29, 1990
Labor Market Prospects for the Disadvantaged, Institute for Research on Poverty

June 28-30, 1990
1990 Meetings, Society for Economic Dynamics and Control*

June 29-July 3, 1990
65th Annual International Conference, Western Economic Association*

July 20-22, 1990
The Standard of Living in Early 19th Century America, NBER

July 23-26, 1990
Franco-American Economic Seminar, NBER

July 31-August 1, 1990
Program Meeting: International Studies, NBER

August 2-3, 1990
International Seminar on International Trade, NBER

August 6-9, 1990
Joint Statistical Meetings, American Statistical Association'

August 9-10, 1990
Program Meeting: International Studies, "International Competitiveness," NBER

August 22-29, 1990
World Congress, Econometric Society*

*Open conference, subject to rules of the sponsoring organization.

August 26-30, 1990
46th Conference: Public Finance with Several Levels of Government, International Institute of Public Finance*

September 13-14, 1990
Panel on Economic Activity, Brookings Instution

September 23-26, 1990
Annual Meeting, National Association of Business Economists*

October 4-5, 1990
Trade Policy, NBER

October 18-20, 1990
Annual Research Conference, Association for Public Policy Analysis and Management*

October 18-21, 1990
Conference on American Economic Policy, NBER

October 26, 1990
Economic Fluctuations Research Meeting, NBER

November 11-14, 1990
83rd Annual Conference on Taxation, National Tax Associatiation-Tax Institute of America*

November 13, 1990
Tax Policy and the Economy, NBER

November 18-20, 1990
Annual Meeting, Southern Economic Association*

December 28-30, 1990
Annual Meeting, American Economic Association*

January 4, 1991
US/Japan Housing Markets, NBER

February 14-17, 1991
Second Annual U.S.-Japan Economic Forum, NBER

March 21-24, 1991
Conference on Economic Crisis, NBER

April 4-6, 1991
Annual Meeting, Midwest Economic Association*

August 19-22, 1991
Joint Statistical Meetings, American Statistical Association*

August 25-29, 1991
47th Congress: Public Finance in a Changing Political Environment, International Institute of Public Finance*

September 22-25, 1991
Annual Meeting, National Association of Business Economists*

October 3-6, 1991
Retrospective on the Bretton Woods System: Lessons for International Monetary Reform, NBER

October 11-14, 1991
International Atlantic Economic Conference, Atlantic Economic Society*

November 24-26, 1991
Annual Meeting, Southern Economic Association*

January 3-5, 1992
Annual Meeting, American Economic Association*

*Open conference, subject to rules of the sponsoring organization.

NBER Group Meets with Soviets

A group of NBER researchers met with IMEMO economists of the U.S.S.R. Academy of Sciences in Moscow on August 24–25 to analyze Soviet views of the U.S. economy and to discuss current and planned economic reform in the Soviet Union. The meeting was organized by Martin Feldstein, NBER and Harvard University, and Revold Entov, IMEMO.

The IMEMO economists presented papers on current American economic issues. (These papers are available from the NBER's Publications Department.) S. A. Nikolaenko looked at the life-cycle accumulation of financial assets and liabilities. He emphasized the effect of expected future income (as measured by the Index of Consumer Sentiment from the Michigan Institute for Social Research) on households' decisions to acquire more debt. Nikolaenko concluded that consumer optimism led to greater borrowing in the 1980s and thus to a lower U.S. saving rate.

I. V. Zukanov examined the "collapse [in the 1980s] of the familiar relationship connecting the budget deficits and the money supply." He found that domestic financial innovation and the increased integration of international financial markets made it easier for the Treasury to attract funds from the (nonbank) public. This reduced the pressure for monetization by the Federal Reserve System.

M. V. Ershov argued that the U.S. trade balance over the last several years improved less than would have been expected based on the decline in the dollar. The most important reason for this, he concluded, was that foreign producers had accepted smaller profit margins rather than losing market share by passing along exchange rate changes in higher prices.

V. Kuznetzov found that movements in stock prices do not predict interest rates, industrial production, or the Consumer Price Index, but do predict corporate dividends. H. Belyanova, M. Boycko, and Y. Lukashin estimated a partial adjustment model that provided strong support for the Fisher effect: namely, that an increase in inflation in the long run leads to an equal increase in nominal interest rates. The period of interest rate adjustment to changes in inflation is longer for assets of longer maturity.

V. I. Martsinkevich estimated the rate of return to investment in human capital in the U.S. labor market. He noted that this rate declined sharply in the 1970s. However, he felt that this decline did not accurately reflect the economic or social value of education.

In a related paper, N. Ivanova estimated that total economic growth is much greater than the growth of all measured inputs. However, this "residual" growth seems to be declining, she finds.

One of the Soviet professors of industrial organization, A. V. Poletayev, estimated that large firms have the same rate of return on equity as small firms, even though their profits are a larger fraction of their sales. M. Boycko developed a new procedure for using persistent differences in profit rates across industries to judge the competitiveness of those industries. S. V. Smirnoff concluded that there is no "critical" level of concentration at which collusion among firms begins.

After the discussion of the Soviets' views of the structure and performance of the U.S. economy, the meeting progressed to the economic restructuring, or "perestroika," underway in the Soviet Union. Most of the Russian economists believe that inflation is their biggest problem. This inflation is mostly repressed now because the prices of necessities are fixed by the state. But a huge "overhang" of outstanding rubles in the hands of the public leads to long queues today and a severe risk of uncontrollable inflation in the future. The fear of the people's reaction to such inflation has deterred attempts to eliminate price controls and to allow prices to be determined by the market.

The current Soviet financial system is a mess, one economist said: the people need rubles that actually can be exchanged for goods, rather than the "wallpaper rubles" they have today. Further, current prices differ so greatly from actual resource costs that allowing individuals to respond freely to monetary incentives *without* removing price controls is counterproductive. The price distortions for both consumer and producer goods are so great that a senior economist declared the planning process no longer capable of controlling the economy. In particular, he said, the current distribution of capital investment makes no sense because the planners cannot guarantee the quality of investment goods.

On the other hand, Entov said, the current system of production is so inflexible that decontrolling the price of meat, for example, would lead to a big jump in price but no change in output.

V. A. Martinov, the director of IMEMO, said that unmet consumer demand has reached "staggering proportions." In such an "unbalanced" economy, relying on economic leverage is impossible. Martinov said that the Soviets continue to rely on central planning to keep the economy going, but postponing price decontrol and the use of the market to allocate resources are the largest obstacles to progress in perestroika. Other economists emphasized that the Soviets realize how counterproductive their previous economic system was, but they do not know how to move to a market system while minimizing the cost to society.

Despite these difficulties, Martinov stated, the Soviets want to move to a market economy using the consumer as their guide. He argued that the Soviet Union needs to revise property relationships completely. Property has been controlled by the bureaucracy, "without concern for the nation to whom it belongs." After discussing some specific proposals to allow new types of private property, Entov pointed out that the key problem is not simply to grant property rights, but rather to convince people that the rights will not be revoked in the future.

The Soviet economists emphasized that substantial resistance to change comes from "below," not just from "above": that is, from the people, not just the party bureaucrats. This is because there is a strong belief in "social fairness" in the Soviet Union and a lack of experience with a market economy. Production and consumption "have been structured politically, not economically," for 60 years. The individuals running the new cooperatives are viewed as "egregious and inveterate criminals" by many people, in part because some of them previously were in the black market, and in part because they charge higher prices than the state stores do.

One economist vehemently argued that the last few years in the Soviet Union have seen "only profound articles in the papers," not a "change in attitudes." He said that the people are not ready to make effective use of their new rights, and that the recent laws on enterprises and land rights actually do not grant much freedom anyway. He believes that the key problem with perestroika is political resistance from people with a "Soviet mentality" that discourages involvement in economic or political affairs and produces an inability to make bold decisions.

Martinov concluded that the next year or two "will be critical" for bringing hope to the people, as there is popular unrest "if not indignation" today. Many of the Soviet economists emphasized the need for quick progress of some sort. The Soviet Union now is directing more resources into consumer goods, but this will help over only the next 18 to 24 months.

The participants from the NBER were: Alan J. Auerbach, University of Pennsylvania; David E. Bradford, Princeton University; Geoffrey Carliner; Douglas W. Elmendorf, Martin Feldstein, Benjamin M. Friedman, Lawrence F. Katz, Lawrence H. Summers, and David A. Wise, Harvard University; Jeffrey A. Frankel, University of California at Berkeley; Jacob A. Frenkel, University of Chicago and International Monetary Fund; R. Glenn Hubbard, Columbia University; Robert E. Lipsey, Queens College, City University of New York; and Robert J. Shiller, Yale University. Thomas Trebat of the Ford Foundation also attended.

Financial Markets and Monetary Economics

Nearly 50 members and guests of the NBER's Program in Financial Markets and Monetary Economics met in Cambridge on October 27. Program Director Benjamin M. Friedman of Harvard University organized the following program:

Ray Chou, Georgia Institute of Technology, and Robert F. Engle and Alex Kane, NBER and University of California at San Diego, "Estimating Risk Aversion with a Time-Varying Price Volatility"
Discussant: Angelo Melino, NBER and University of Toronto

Benjamin M. Friedman, and David I. Laibson, London School of Economics, "Economic Implications of Extraordinary Movements in Stock Prices"
Discussant: Robert J. Shiller, NBER and Yale University

Martin Evans, New York University, and Paul Wachtel, NBER and New York University, "A Modern Look at Asset Pricing and Short-Term Interest Rates"
Discussant: Frederic Mishkin, NBER and Columbia University

James H. Stock, NBER and Harvard University, and Matthew Richardson, University of Pennsylvania, "Drawing Inferences from Statistics Based on Multiyear Asset Returns"
Discussant: William G. Schwert, NBER and University of Rochester

Yannis Ioannides, NBER and Virginia Polytechnic Institute, "Dynamics of the Composition of Household Asset Portfolios and the Life Cycle"
Discussant: Miles S. Kimball, NBER and University of Michigan

Charles Lee and Richard Thaler, Cornell University; and Andrei Shleifer, NBER and University of Chicago, "Investor Sentiment and the Closed-End Fund Puzzle"
Discussant: Bruce N. Lehmann, NBER and Columbia University

Chou, Engle, and Kane decompose the predictable component in stock returns into two parts: the time-varying coefficient measuring the price of volatility, and the time-varying conditional variance of the returns. Although the price of "risk" as a parameter of consumers' taste generally is assumed to be relatively stable, the price of "volatility" of the stock return can vary substantially over time. Stocks constitute only a small portion of total wealth; hence the expected return of the stock index not only depends on its own volatility but also is affected by the covariance of stocks with the other portion of total wealth. This portion of wealth is represented by an unobserved component that affects the stock return and is manifested by the

temporal variations in the price volatility. Chou, Engle, and Kane find that the price of volatility is highly correlated with the ratio of corporate profit over national income and the inflation rate.

Friedman and Laibson propose a two-part representation of the risk associated with stock returns. One component is normally distributed, with given mean and variance, and realized in each period. An additional component is realized on infrequent occasions, independently of the first component and with different mean and variance. Friedman and Laibson find that: first, the behavior of quarterly stock returns in the United States since World War II is consistent with such a two-component model. Second, viewing stock returns in this way sheds new light on familiar questions about their important time-series properties. Specifically, the evidence for both serial correlation and persistence of volatility is greater for the ordinary, every-period component of returns than for observed returns consisting of both ordinary and extraordinary components. Third, risk-averse market participants, allocating their portfolios and attempting to learn about the magnitude and frequency of market "crashes" from evidence that they have in hand, plausibly could behave in such a way as to give rise to the macroeconomic behavior posited by Minsky's "financial instability hypothesis."

Evans and Wachtel develop a general specification of asset pricing equilibrium. They ask whether the theory adequately explains movements in short-term interest rates. They find that econometric specifications that allow for changing attitudes toward risk through coefficients that evolve over time do provide substantial insights into the movement of interest rates in the last 25 years.

The possibility of mean reversion in stock prices has been examined recently using a variety of statistics based on multiyear returns on stock portfolios. Stock and Richardson develop a theory for statistics involving multiyear asset returns. They then apply these techniques to both published and new empirical estimates based on monthly data from 1926–85. They find that evidence previously thought to support the mean-reversion hypothesis appears substantially weaker.

Ioannides uses data from the 1983 and 1986 Surveys of Consumer Finances to analyze the determinants of households' choice of assets. Specifically, he considers how much household asset portfolios were restructured between 1983 and 1986 and the impact of factors such as changes in age, socioeconomic characteristics, labor market status, access to information about investment opportunities, attitudes toward risk and illiquidity of investment opportunities, and life-cycle events. He finds that households indeed set their asset portfolios with the long run in mind; they do not seem to restructure their portfolios as their labor market status changes. However, there was some restructuring between 1983 and 1986 as nonhuman wealth changed, and the persistence of the portfolio composition over time varied across assets. Attitudes toward risk and liquidity of investments do affect restructuring for several asset categories, but access to professional investment advice has a significant effect only for a few asset categories.

Lee, Thaler, and Shleifer ask whether shifts in investor sentiment influence the pricing of closed-end mutual funds. Theory predicts that new closed-end funds get started when old ones sell at premiums or small discounts, that discounts on different funds move together over time, and that discounts on closed-end funds move together with other assets held predominantly by small investors. The authors confirm these predictions and find in particular that closed-end fund discounts narrow when small stocks do well, holding constant returns on the market. The evidence suggests that discounts on closed-end funds capture the sentiment factor of small investors.

Taxation Program Meeting

Approximately 40 members and guests of the NBER's Program in Taxation met in Cambridge on November 16–17. The program was:

Bernard Fortin and Thomas Lemieux, MIT, "Taxes and Labor Supply in the Underground Economy: Some Econometric Evidence"

Discussant: Ann Dryden Witte, NBER and Wellesley College

Glenn T. Sueyoshi, NBER and University of California at San Diego, "Social Security and the Determinants of Full and Partial Retirement: A Competing-Risks Analysis" (NBER Working Paper No. 3113)

Discussant: Robert Moffitt, NBER and New York University

James R. Hines, Jr., NBER and Princeton University, "Progressive Income Taxes: The Reagan Record, Consistently Measured"

Discussant: James M. Poterba, NBER and MIT

Kenneth L. Judd, NBER and Hoover Institution, "Optimal Taxation in Dynamic Stochastic Economies: Theory and Evidence"

Discussant: Roger H. Gordon, NBER and University of Michigan

Jane G. Gravelle, Congressional Research Service, "Income, Consumption, and Wage Taxation in a Life-Cycle Model: Separating Efficiency from Redistribution"

Discussant: Jonathan S. Skinner, NBER and University of Virginia

John Whalley, NBER and University of Western Ontario, "Should Banks Be Taxed?"

Discussant: Alan J. Auerbach, NBER and University of Pennsylvania

Louis Kaplow, NBER and Harvard University, "Opti-

mal Taxation with Costly Enforcement and Evasion" (NBER Working Paper No. 2996)
Discussant: Michael Rothschild, NBER and University of California at San Diego

Fortin and Lemieux use a unique dataset collected in Quebec City and a simple labor supply model to explain how many hours an individual works and how much earnings are reported to tax authorities. In the model, the wage rate for regular (reported) activities is parametric, while earnings from irregular (or unreported) activities are a concave function of hours worked. This distinction explains why the observed supply elasticity for regular hours is positive while the supply elasticity for irregular hours is negative. Fortin and Lemieux find that the implicit marginal tax rate is an important determinant of the decision not to report some labor earnings. They show that when tax rates go up, the income tax base is reduced, but not by enough to reduce total tax revenues.

Sueyoshi considers the determinants of retirement in a competing-risks model that allows for full and partial retirement. He finds that the large increase in Social Security benefits in the early 1970s increased the probability of early (before age 65) full retirement by less than 5 percent and reduced the probability of partial retirement by 1–2 percent.

Hines presents a new method of analyzing the progressivity of income taxes in which the degree of measured tax progressivity is not affected by the amount of revenue collected by the tax system. He uses this procedure to evaluate U.S. federal income tax changes enacted during the Reagan administration. Hines finds that the tax cuts in the early 1980s did not significantly reduce the progressivity of the U.S. income tax system, and that the system (by 1984) was still very progressive relative to its historical average. Further, the U.S. tax system in 1984 was more progressive than the tax systems of Canada, Japan, Sweden, and the United Kingdom during the 1980s. However, the Tax Reform Act of 1986 may reduce U.S. tax progressivity significantly.

Judd examines the optimal taxation of labor and capital income in various models of dynamic, stochastic economies. He finds that the random walk test for optimality, popularized by Barro, applies only to labor taxation. Optimal tax rates on capital income are more volatile. When appropriate tax rates are used, the optimality hypothesis is favored by the evidence from the postwar era. This model has implications for analyses of both fiscal and monetary policy. First, several seemingly irrational features of U.S. tax policy (for example, nominal depreciation allowances and income taxation instead of consumption taxation) may contribute to the efficiency of taxation in a stochastic environment. Second, examinations of the optimality of monetary policy should focus on the nominal aspects of the tax system since seigniorage is relatively insignificant. Third, observations that fiscal surpluses are positively related to changes in the unemployment rate are consistent with optimal taxation in a real business cycle and therefore do not support Keynesian fiscal policy interpretations.

Gravelle introduces a computationally less demanding method of separating efficiency from redistribution when substituting a consumption or wage tax for an income tax in a life-cycle model. This simplified approach permits the study of more realistic models of the U.S. economy, including the presence of bequests, endogenous labor supply, and many goods. Despite the claims frequently made for the superiority of the consumption over the income tax base, the results suggest that a uniform income tax may be more efficient than a uniform consumption tax; the major cost of the income tax over aternative tax bases lies in its differential taxation of capital income rather than its intertemporal distortion.

Whalley asks whether banks should be taxed. Recently there has been debate on the possible inclusion of banking in broadly based value-added taxes in New Zealand and Canada. Whalley argues that individual preferences are not defined over these services, but only over the goods that are consumed. Intermediation services facilitate consumption, but do not directly provide utility. Applying his approach to U.S. data, Whalley obtains a similar result.

Kaplow analyzes the relationship between optimal taxation—or raising revenue with minimum distortion—and optimal tax enforcement—or raising revenue at the least cost. A central question concerns the extent to which revenue should be raised through higher tax rates, which distort behavior, or through greater enforcement, which distorts behavior because it raises marginal effective tax rates and also entails direct resource costs. Under each of several assumptions about evasion and enforcement, some expenditure on enforcement may be optimal despite its resource cost, its distortionary effect, and the availability of other revenue sources having no enforcement costs.

Research in Productivity Discussed

About 25 members and guests of the NBER's Program in Productivity met in Cambridge on December 3–4. Five works in progress were discussed:

Iain M. Cockburn, NBER and University of British Columbia, "Appropriability and the Propensity to Patent: Some Empirical Results"

Jeffrey I. Bernstein, NBER and Carleton University, and M. Ishaq Nadiri, NBER and New York University, "Interindustry R and D Spillovers,

Product Demand, Production, and Capital Accumulation"

Joshua Rosett, NBER, "Pharmaceutical Price Indexes at the Firm Level and in the PPI"

Ernst R. Berndt, NBER and MIT, and Zvi Griliches, NBER and Harvard University, "Microcomputer Price Indexes: Alternative Estimates"

Zoe Georganta, University of Thessaloniki, and Donald Siegel, State University of New York at Stony Brook, "Errors in Output Deflators Revisited: 1972-77-82, Unit Values and the PPI"

In addition, the following completed papers were presented:

Bronwyn H. Hall, NBER and University of California at Berkeley, "The Impact of Corporate Restructuring on Industrial Research and Development" (NBER Working Paper No. 3216)

Martin Neil Baily, NBER, Brookings Institution, and University of Maryland, and Charles L. Schultze, The Brookings Institution, "The Productivity of Capital in a Period of Slower Growth"

Hall asks whether the recent wave of corporate restructuring in the United States has reduced impact on investment in research and development by industrial firms. Using a newly constructed sample of about 2500 manufacturing firms from 1974 to 1987, she examines three major types of restructuring: leveraged buyouts and other "going private" transactions; mergers and acquisitions in general; and substantial increases in leverage. Hall concludes that leveraged buyouts do not occur in sectors or firms that are R and D-intensive and therefore cannot be having much of an impact on R and D spending. She also finds that major increases in leverage are followed by substantial declines in the R and D intensity of the firms in question, and the effect takes at least three years to work through. Finally, Hall finds that any declines in the R and D intensity of acquiring firms, relative to their history, appear to be associated with the leverage structure of the transaction rather than with the acquisition itself.

Baily and Schultze evaluate the contribution of physical capital to productivity growth. They uncover evidence of diminishing returns to capital. They also find that knowledge capital has external effects on productivity, but that imperfect competition and increasing returns are not very important. The rapid growth of the European countries and Japan does not suggest that capital's contribution to output exceeds its share of income; rather, the European and Japanese growth is caused by their convergence to the U.S. level of productivity, the authors argue. Finally, Baily and Schultze stress that, despite their conclusions, capital growth remains an important source of productivity growth. The United States is probably accumulating capital at a rate that is too low, relative to an optimal growth path.

Also attending the meeting were: Kim B. Clark, Adam B. Jaffe, and Daniel M. G. Raff, NBER and Harvard University; Edwin R. Dean, Bureau of Labor Statistics; Ellen Dulberger, IBM Corporation; Barbara M. Fraumeni, Northeastern University; Robert J. Gordon, NBER and Northwestern University; Wayne B. Gray, NBER and Clark University; Shane Greenstein, Stanford University; Rebecca Henderson, MIT, Charles R. Hulten, NBER and University of Maryland; Elizabeth Kremp, NBER; Frank R. Lichtenberg, NBER and Columbia University; Catherine G. Morrison, NBER and Tufts University; Ariel Pakes, NBER and Yale University; Manuel Trajtenberg, NBER and Tel-Aviv University; and Jack E. Triplett, Bureau of Economic Analysis.

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1290. "International Evidence on the Persistence of Economic Fluctuations," by John Y. Campbell and N. Gregory Mankiw, 1989 (NBER Working Paper No. 2498)

1291. "Fiscal Increasing Returns, Hysteresis, Real Wages, and Unemployment," by Olivier Jean Blanchard and Lawrence H. Summers, 1987 (NBER Working Paper No. 2034)

1292. "Did Henry Ford Pay Efficiency Wages?" by Daniel M. G. Raff and Lawrence H. Summers, 1987 (NBER Working Paper No. 2101)

1293. "Workers' Compensation, Wages, and the Risk of Injury," by Ronald G. Ehrenberg, 1989 (NBER Working Paper No. 1538)

1294. "Real Exchange Rates and Productivity Growth in the United States and Japan," by Richard C. Marston, 1987 (NBER Working Paper No. 1922)

1295. "Optimal Time-Consistent Fiscal Policy with Finite Lifetimes: Analysis and Extensions," by Guillermo A. Calvo and Maurice Obstfeld, 1988 (NBER Working Paper No. 1593)

1296. "Economic Consequences of the Franc Poincaré," by Barry J. Eichengreen and Charles Wyplosz, 1988 (NBER Working Paper No. 2064)

1297. "The Postwar Evolution of Computer Prices," by Robert J. Gordon, 1989 (NBER Working Paper No. 2227)

1298. "Promises, Promises: The States' Experience with Income Tax Indexing," by Daniel R. Feenberg and Harvey S. Rosen, 1988 (NBER Working Paper No. 2712)

1299. "Savings Promotion, Investment Promotion, and International Competitiveness," by Lawrence H. Goulder and Barry J. Eichengreen, 1989 (NBER Working Paper No. 2635)

1300. "Exchange Rate Pass-Through When Market Share Matters," by Kenneth A. Froot and Paul D. Klemperer, 1989 (NBER Working Paper No. 2542)

1301. "Are Prices Too Sticky?" by Laurence Ball and David H. Romer, 1989 (NBER Working Paper No. 2171)

1302. "Deterioration of the Terms of Trade and Capital Accumulation: A Reexamination of the Laursen-Metzler Effect," by Partha Sen and Stephen J. Turnovsky, 1989 (NBER Working Paper No. 2616)

1303. "Fiscal Deficits and Relative Prices in a Growing World Economy," by Maurice Obstfeld, 1989 (NBER Working Paper No. 2725)

1304. "Stock Prices under Time-Varying Dividend Risk," by Andrew B. Abel, 1988 (NBER Working Paper No. 2621)

1305. "Testing the Rationality of State Revenue Forecasts," by Daniel R. Feenberg, William Gentry, David Gilroy, and Harvey S. Rosen, 1989 (NBER Working Paper No. 2628)

1306. "The Sensitivity of Tests of the Intertemporal Allocation of Consumption to Near-Rational Alternatives," by John H. Cochrane, 1989 (NBER Working Paper No. 2730)

1307. "U.S. International Capital Flows: Perspectives from Rational Maximizing Models," by Robert J. Hodrick, 1989 (NBER Working Paper No. 2729)

1308. "Can Interindustry Wage Differentials Justify Strategic Trade Policy?" by Lawrence F. Katz and Lawrence H. Summers, 1989 (NBER Working Paper No. 2739)

1309. "Employee Crime and the Monitoring Puzzle," by William T. Dickens, Lawrence F. Katz, Kevin Lang, and Lawrence H. Summers, 1989 (NBER Working Paper No. 2356)

1310. "The Informational Content of Ex Ante Forecasts," by Ray C. Fair and Robert J. Shiller, 1989 (NBER Working Paper No. 2503)

1311. "Intergenerational Transfers and Savings," by Laurence J. Kotlikoff, 1988 (NBER Working Paper No. 2237)

1312. "What Do VERs Do?" by Kala Krishna, 1989 (NBER Working Paper No. 2612)

1313. "Breath Testing and Highway Fatality Rates," by Henry Saffer and Frank Chaloupka, 1989 (NBER Working Paper No. 2301)

1314. "Mortality Risk and Bequests," by Michael D. Hurd, 1989 (NBER Working Paper No. 1826)

1315. "Horizontal Equity: Measures in Search of a Principle," by Louis Kaplow, 1989 (NBER Working Paper No. 1679)

1316. "Hysteresis in Unemployment," by Olivier J. Blanchard and Lawrence H. Summers, 1987 (NBER Working Paper No. 2035)

1317. "Differences in Income Elasticities and Trends in Real Exchange Rates," by Paul R. Krugman, 1989 (NBER Working Paper No. 2761)

1318. "The Effect of the Investment Tax Credit on the Value of the Firm," by Andrew B. Lyon, 1989 (NBER Working Paper No. 2537)

1319. "The Effect of Wage Bargains on the Stock Market Value of the Firm," by John M. Abowd, 1989 (NBER Working Paper No. 2137)

1320. "Why Is Consumption So Smooth?" by John Y. Campbell and Angus Deaton, 1989 (NBER Working Paper No. 2134)

1321. "The Time Variation of Risk and Return in the Foreign Exchange and Stock Markets," by Alberto Giovannini and Philippe Jorian, 1989 (NBER Working Paper No. 2573)

1322. "Uncertainty and Liquidity," by Alberto Giovannini, 1989 (NBER Working Paper No. 2296)

1323. "Market-Based Debt-Reduction Schemes," by Paul R. Krugman, 1989 (NBER Working Paper No. 2587)

1324. "How Integrated Are World Capital Markets?" by Maurice Obstfeld, 1989 (NBER Working Paper No. 2075)

1325. "Financing versus Forgiving a Debt Overhang," by Paul R. Krugman, 1988 (NBER Working Paper No. 2486)

1326. "Competition within the Firm: Theory Plus Some Evidence from Medical Group Practice," by Martin Gaynor, 1989 (NBER Working Paper No. 1866)

Technical Papers Series

The following studies in the NBER Technical Working Papers series are now available (see previous issues of the *NBER Reporter* for other titles). Like NBER Working Papers, these studies may be obtained by sending $2.00 per paper to: Technical Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please do not send cash.

82. "The Positive Economics of Methodology," by James A. Kahn, Steve Landsburg, and Alan C. Stockman. November 1989 (JEL Nos. 036, 210)

83. "A Simple MLE of Cointegrating Vectors in Higher-Order Integrated Systems," by James H. Stock and Mark W. Watson. December 1989 (JEL No. 210)

Height, Health, and History

Height, Health, and History: Nutritional Status in the United Kingdom, 1750-1980, by Roderick Floud, Annabel Gregory, and Kenneth Wachter, is now available from Cambridge University Press. This monograph is part of a major NBER study of the role of nutrition in economic development since 1700, and is priced at $54.50.

Using data from the military and other sources to establish the changing heights of Britons during the period of industrialization, this innovative new study adds an important dimension to the controversy about living standards during the Industrial Revolution.

Floud is an NBER research associate and a professor at the City of London Polytechnic. Gregory is a professor at Birkbeck College, London. Wachter is an NBER research associate and a professor at the University of California, Berkeley.

Order directly from: Cambridge University Press, 420 West 20th Street, New York, NY 10011.

Bureau Books

Lotteries Book Is Published

Selling Hope: State Lotteries in America, by Charles T. Clotfelter and Philip J. Cook, is available from Harvard University Press for $29.50.

Selling Hope, the final report on an NBER study conducted by Clotfelter and Cook, comprehensively describes lottery games and prize structures, who plays, why they play, and how they play. It shows how low-income people are disproportionately represented among lottery customers and how a small fraction of all players account for a major share of lottery revenues.

In addition to questioning who bears the burden of lottery finance, Clotfelter and Cook ask whether lotteries have been truthful in advertising, and whether they can provide a stable source of revenue. Finally, can lotteries' businesslike orientation be reconciled with the public interest? This book should interest policymakers, academics, and anyone who wants to learn more about this important source of state revenues.

Clotfelter, an NBER research associate, and Cook are both professors of public policty studies and economics at Duke University.

This book may be ordered from: Harvard University Press, 79 Garden Street, Cambridge, MA 02138.

Sachs/Collins Volume Is Available

Developing Country Debt and Economic Performance, Volume 3: Country Studies—Indonesia, Korea, Philippines, Turkey is available from the University of Chicago Press for $85. Its editors are Jeffrey D. Sachs, a research associate in the NBER's Program in International Studies and the Galen L. Stone Professor of International Trade at Harvard University, and Susan M. Collins, an NBER faculty research fellow and an associate professor of economics at Harvard who is currently on leave at the Council of Economic Advisers.

This volume includes an introduction by Collins that compares the experiences of all eight debtor countries studied in this NBER project, and in-depth studies of Indonesia, Korea, the Philippines, and Turkey. Each country study is coauthored by an economist teaching in the United States and one living in the debtor country. In addition to detailing the debt crisis in each country, this volume has much new information about the countries' economic development. It should be useful for economists and others interested in development and developing countries.

This volume may be ordered from the University of Chicago Press, 11030 South Langley Avenue, Chicago, IL 60628.

Current Working Papers

Individual copies of NBER Working Papers and Historical Factors in Long-Run Growth Working Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies of Working Papers by sending $2.00 per copy to Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please make checks payable to the National Bureau of Economic Research, Inc. Please do not send cash.

Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since October 1989 are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

Historical Factors in Long-Run Growth

Poverty and Prosperity: A Longitudinal Study of Wealth Accumulation, 1850-60

Richard H. Steckel
Historical Working Paper No. 8
December 1989
JEL No. 042

This paper depicts and analyzes the distribution and mobility of wealth in a national sample of nearly 1600 households matched in the 1850 and 1860 manuscript schedules of the Census. I estimate Gini coefficients, a transition matrix, the Shorrocks measure, and a regression model of wealth accumulation from these data. The findings shed light on theories of the wealth distribution, life-cycle behavior, and regional economic performance, and on the empirical basis for critiques of capitalism.

Blacks accumulated wealth slowly, but the foreign-born performed remarkably well. The distribution of wealth was relatively unequal on the frontier, but that region performed well in enabling people to begin to acquire property. Residents of eastern cities were less fluid than other residents of the rural north. The wealth of blue collar workers and the unskilled declined relative to that of farmers and white collar workers during the decade, which suggests that other aspects of wealth determination may have outweighed the stretching of the wage structure as an explanation of growing inequality during industrialization. Comparisons with data on net family assets collected by the National Longitudinal Survey in the 1960s and 1970s show that mid-nineteenth-century households were less mobile at the lower end but more mobile at the upper end of the wealth distribution than their counterparts in the next century.

Lessons from the American Experience with Free Banking

Hugh Rockoff
Historical Working Paper No. 9
December 1989
JEL No. 042

In recent years there has been considerable interest in historical experiments with "free banking." This paper examines the American experiments in the decades before the Civil War, and the recent literature about them. It considers: 1) the appropriate mechanism for controlling the monetary base; 2) the need for a lender of last resort; 3) the costs and benefits of a bank-issued currency; and 4) the potential under free banking for wildcat banking.

The Democratization of Invention during Early Industrialization: Evidence from the United States, 1790-1846

Kenneth L. Sokoloff and **B. Zorina Khan**
Historical Working Paper No. 10
December 1989
JEL No. 042

We argue that inventive activity during early American industrialization grew rapidly because segments of the population with relatively common skills and knowledge disproportionately increased their inventing. The rise in patenting, rather than being accounted for by an elite with rare skills or large amounts of financial resources, coincided with new patents granted to many individuals, in various occupations and geographic districts, who had been only modest participants beforehand. We base our conclusion on: 1) major shifts in

the occupational and geographic distributions of patentees; 2) a growing share of patents being awarded to individuals with few career patents; 3) a generally low level of specialization in invention on the part of patentees, with no trend over the period; and 4) a pattern of individuals with few career patents and low specialization being represented disproportionately among patentees in transitional counties that only recently had realized substantial increases in patenting. We further suggest that the nature of technology during this era permitted a range of relatively elastic supply of invention, and accordingly allowed the expansion of markets to spread high levels of inventive activity.

The Capital Markets in the 1850s

Hugh Rockoff
Historical Working Paper No. 11
January 1990
JEL No. 042

This paper brings together data from a variety of sources to create a portrait of net rates of return to capital in banking in the 1850s. It provides estimates comparable to those developed by Lance Davis and many subsequent researchers for the postbellum period. The conclusion that emerges is that the capital market in the developed regions of the United States was integrated fairly well in the 1850s, and that part of the wide divergence in rates observed in the 1870s was caused by the disruptions of the Civil War.

NBER Working Papers

Endogenous Growth and the Role of History

Mervyn A. King and **Mark Robson**
Working Paper No. 3151
October 1989

This paper presents a model in which the realizations of stochastic tax and depreciation rates determine both the level and the growth rate of output: externalities to investment—learning by watching—are characterized by diminishing returns, yielding a nonlinear "technical progress function." This results in multiple steady-state growth rates. History matters. It is possible that two economies with identical "deep" parameters and initial capital stocks may cycle around different trend growth rates, depending upon the historical path of fiscal shocks. Growth and cycles interact, and the nonlinearity means that output changes cannot be decomposed into a stochastic trend and a trend-stationary process.

International Tax Competition and Gains from Tax Harmonization

Assaf Razin and **Efraim Sadka**
Working Paper No. 3152
October 1989
JEL Nos. 430, 320

In a world economy, capital income taxation can cause two types of distortions in addition to the standard, closed-economy wedge between the consumer/saver marginal intertemporal rate of substitution and the producer/investor marginal productivity of capital: 1) international differences in intertemporal marginal rates of substitution, implying an inefficient allocation of world savings across countries; and 2) inefficient allocation of world investment across countries. This paper focuses on the structure of taxation for countries engaged in tax competition and on the potential gains from tax harmonization. We show that if the competing countries are coordinated sufficiently with the rest of the world, then tax competition leads each country to apply the *residence principle* of taxation and there are no gains from tax harmonization. If, however, there is not sufficient coordination, then tax competition leads to low capital income taxes and the tax burden falls on the internationally immobile factors. Nevertheless, the outcome is still efficient relative to the available constrained set of tax instruments.

Yield Spreads and Interest Rate Movements: A Bird's-Eye View

John Y. Campbell and **Robert J. Shiller**
Working Paper No. 3153
October 1989
JEL No. 313

The expectations theory of the term structure implies that the spread between a longer-term interest rate and a shorter-term interest rate forecasts two subsequent changes in interest rates: the change in the yield of the longer-term bond over the life of the shorter-term bond; and a weighted average of the changes in shorter-term rates over the life of the longer-term bond. For postwar U.S. data from McCulloch (1987) and just about any combination of maturities between one month and ten years, the former relationship is not borne out by the data; the latter relationship is, more or less.

When the yield spread is high, the yield on the longer-term bond tends to fall, contrary to the expectations theory. At the same time, the shorter-term interest rate tends to rise, just as the expectations theory requires.

We discuss several possible interpretations of these findings. We argue that they are consistent with a mod-

el in which the spread is a multiple of the value implied by the expectations theory. This model could be generated by time-varying risk premiums that are correlated with expected increases in short-term interest rates, or by a failure of rational expectations in our sample period.

Stock Market Forecastability and Volatility: A Statistical Appraisal

N. Gregory Mankiw, David H. Romer,
and **Matthew D. Shapiro**
Working Paper No. 3154
October 1989
JEL Nos. 313, 212

This paper presents and implements statistical tests of stock market forecastability and volatility that are immune to the severe statistical problems of earlier tests. Although we reject the null hypothesis of strict market efficiency, the evidence against it is not overwhelming. That is, the data do not provide evidence of gross violations of the conventional valuation model.

Job Security and Work Force Adjustment: How Different Are U.S. and Japanese Practices?

Katharine G. Abraham and **Susan N. Houseman**
Working Paper No. 3155
November 1989

This paper compares adjustment of employment and hours in Japanese and U.S. manufacturing. In contrast to some previous work, this study shows that adjustment of total labor input to changes in demand is significantly greater in the United States than in Japan. Adjustment of employment is significantly greater in the United States, while adjustment of average hours is about the same in the two countries. Although workers in Japan enjoy greater employment stability than U.S. workers do, there is considerable variability in the adjustment patterns across groups within each country. In the United States, most of the adjustment is borne by production workers. In Japan, female workers in particular bear a disproportionate share of adjustment.

Japanese Finance: A Survey

Jeffrey A. Frankel
Working Paper No. 3156
November 1989
JEL Nos. 521, 441, 430

Five factors puzzle observers of Japanese financial markets, particularly those with a U.S. viewpoint: the apparently low corporate cost of capital; low real interest rates; high equity prices; high land prices; and the rising real yen. To see how these factors interact, this paper surveys the literature and discusses: the leverage of Japanese firms; dividend payout; equity price-earnings ratios; corporate taxation; cross-ownership; land price-rental ratios; speculative bubbles; the household saving rate; international capital mobility; expected real appreciation of the yen; the lower cost of financing investment internally and through "main bank" relationships; and the move to a more market-oriented system as these relationships break down.

I conclude that the real interest rate in Japan may remain below that in the United States, despite international arbitrage. Second, the main relevant effect of the internationalization in Japan may have been to accelerate the process whereby corporate finance becomes market oriented. As a result, affiliated firms are losing the special privileges of borrowing at a cheaper rate, while unaffiliated firms are able to borrow more cheaply than before. Finally, the increased availability of funds for asset-market arbitrage allowed the great run-up in equity and land prices in the 1980s.

Explaining the Variance of Price-Dividend Ratios

John H. Cochrane
Working Paper No. 3157
November 1989

This paper presents a bound on the variance of the price-dividend ratio and decomposes that variance into components reflecting variation in expected future discount rates and variation in expected future dividend growth. I characterize unobserved discount rates needed to make the variance bound and the variance decomposition hold. I then test the variance bound and decomposition for several discount rate models, including the consumption-based model and models based on interest rates plus a constant risk premium.

Commodity Prices and Inflation: Evidence from Seven Large Industrial Countries

James M. Boughton, William H. Branson,
and **Alphecca Muttardy**
Working Paper No. 3158
November 1989
JEL Nos. 132, 134

This paper examines the relationships between movements in primary commodity prices and changes in in-

flation in the large industrial countries. It begins by developing a two-country model in order to examine the theoretical effects of monetary, fiscal, and supply-side disturbances on commodity and manufactures prices and on exchange rates. We show that if monetary shocks dominate, commodity prices should lead general price movements, and the level of commodity prices should be correlated with the general inflation rate. Nonmonetary shocks generally weaken these relationships, but such disturbances may cancel each other out for broad indexes covering a wide range of commodities.

We develop country-specific commodity price indexes for the major industrial countries. The weights assigned to different commodities vary substantially across countries. Nevertheless, when the indexes are expressed in a common currency, they tend to be highly correlated over time, except when sharp movements occur in certain commodity prices. The major source of contrast in the behavior of the indexes across countries is exchange rate movements.

Several empirical tests broadly support the conclusions of the theoretical model, with relatively few differences across countries. We cite three main tendencies: First, low inflation in industrial countries has tended to be associated with low levels of commodity prices, and vice-versa. Commodity price levels are cointegrated with consumer price inflation rates. Second, there has been some tendency for movements in commodity prices to precede changes in general inflation rates by a few months, although it is not clear whether this tendency is strong enough to be a reliable aid in forecasting the rate of inflation. Third, there is a strong and fairly reliable tendency for turning points in the rate of change in commodity prices to precede turning points in general inflation rates. Commodity prices thus appear to contribute to predictions of inflation rates but more strongly to predictions of turning points in inflation.

A Quasi-Experimental Approach to the Effects of Unemployment Insurance

Bruce D. Meyer
Working Paper No. 3159
November 1989
JEL Nos. 320, 820

This paper uses the natural experiment provided by periodic increases in state benefit levels to estimate the effects of higher unemployment insurance (UI) benefits. I compare individuals who filed just before and just after 16 benefit increases, using data from five states for 1979–84.

I find that the increases, which average about 9 percent, lengthen the period of receipt of UI by about one week. I estimated this effect precisely and found it by using several approaches. The incidence of layoffs resulting in UI claims is not affected by the benefit increases. Nor does the evidence suggest that higher benefits lead to better jobs. In fact, the post-unemployment earnings of individuals receiving higher benefits seem to fall slightly, but the estimates are imprecise.

Real Business Cycles and the Test of the Adelmans

Robert G. King and **Charles I. Plosser**
Working Paper No. 3160
November 1989
JEL No. 131

This paper conducts a modern variant of the test proposed and carried out by Adelman and Adelman (1959). Using the methods developed by Burns and Mitchell (1946), we try to distinguish between the economic series generated by an actual economy and the analogous artificial series generated by a stochastically perturbed economic model. The Adelmans' model corresponded to the Klein-Goldberger equations. In our case, the model corresponds to a simple real business cycle model. The results indicate a fairly high degree of coincidence in key economic aggregates between the business cycle characteristics identified in actual data and those found in our simulated economy.

Latin American Economic Development: 1950–80

Eliana A. Cardoso and **Albert Fishlow**
Working Paper No. 3161
November 1989
JEL No. 121

This paper stresses the evolutionary and adaptive aspects of Latin American growth between 1950 and 1980, and provides a synthetic view by considering the sources of growth within a simple production framework. The regressions, using quinquennial panel data for 18 Latin American countries, estimate the net return to investment, the elasticity of output to labor, and the contribution of other variables that influence efficiency. They show that Latin American growth varied systematically with trade performance.

We also find a negative correlation between inflation and per capita income growth in the region. An inflation rate of even 20 percent reduces the per capita growth rate by 0.4 percentage point, or by almost 15 percent of the regional mean of 3 percent growth between 1950 and 1980. This result does not hold, however, when high inflation observations are excluded.

Finally, we call attention to the persistent problems of income distribution and poverty.

Could a Monetary Base Rule Have Prevented the Great Depression?

Bennett T. McCallum
Working Paper No. 3162
November 1989
JEL Nos. 130, 311, 042

This paper continues an ongoing investigation of the properties of a specific, quantitative, and operational rule for the conduct of monetary policy, a rule that specifies settings of the monetary base that are designed to keep nominal GNP growing smoothly at a noninflationary rate. Whereas previous studies have examined the rule's performance in the context of U.S. experience since World War II, this paper is concerned with 1923–41. I conduct counterfactual historical simulations with the rule and estimate a small model of nominal GNP determination with U.S. quarterly data for 1922–41. Residuals from the estimated relationships serve as estimates of the behavioral shocks that occurred and, accordingly, are fed into the simulation process quarter by quarter. The simulation results indicate that nominal GNP would have been kept reasonably close to a steady 3 percent growth path over 1923–41 if the rule had been in effect, in which case it is highly unlikely that real output and employment could have collapsed as they did during the 1930s.

International Trade Effects of Value-Added Taxation

Martin Feldstein and **Paul R. Krugman**
Working Paper No. 3163
November 1989
JEL Nos. 323, 441

The actual value-added tax (VAT) systems used in many countries differ significantly from the completely general VAT that has been the focus of most economic analyses. In practice, VAT systems exempt broad classes of consumer goods and services. This has important implications for the effect of the VAT on international trade.

A VAT is sometimes advocated as a way of improving a country's international competitiveness because GATT rules permit the tax to be levied on imports and rebated on exports. This leads to political support for the VAT among exporters and producers of import-competing products.

For a general VAT on all consumption, this argument is incorrect except in the very short run because exchange rates or domestic prices adjust to offset the effect of the tax on the relative prices of domestic and foreign goods. When prices or exchange rates have adjusted, a general VAT will have no effect on imports and exports.

In practice, the VAT frequently exempts housing and many personal services, thus raising the price of tradables relative to nontradables and inducing a substitution of housing and services for tradable goods. Since this implies a reduced consumption of imported goods, it also implies a decline in exports. The most likely effect of the introduction of a VAT thus would be a decline in exports.

National Saving and International Investment

Philippe Bacchetta and **Martin Feldstein**
Working Paper No. 3164
November 1989
JEL Nos. 441, 522

This paper extends earlier work by Feldstein and Horioka on the relationship between domestic saving rates and international capital flows or, equivalently, between domestic saving rates and domestic investment. We conclude here that an increase in domestic saving has a substantial effect on the level of domestic investment, although a smaller effect than would have been observed in the 1960s and 1970s. The savings retention coefficient for 1980–6 is 0.79, down from 0.91 in the 1960s and 0.86 in the 1970s.

The more closely integrated economies of the European Economic Community also appear to have more outward capital mobility (that is, a lower saving retention coefficient) than other OECD countries.

There is no support for the view that the estimated saving-investment relationship reflects a spurious impact of an omitted variable for economic growth.

Although budget deficits are related inversely to the difference between private investment and private saving, we reject the view that this reflects an endogenous response of fiscal policy in favor of the alternative interpretation that the negative relationship is evidence of crowding out of private investment by budget deficits. This interpretation is supported by the evidence that domestic investment responds equally to private saving and to budget deficits.

The implication of the analysis thus supports the original Feldstein-Horioka conclusion that increases in domestic saving raise a nation's capital stock and therefore the productivity of its work force. Similarly, a tax on capital income is not likely to be shifted fully to labor and land by the outflow of enough capital to maintain the real rate of return.

Long Swings in the Exchange Rate: Are They in the Data and Do Markets Know It?

Charles M. Engel and **James D. Hamilton**
Working Paper No. 3165
November 1989
JEL No. 431

The value of the dollar appears to move in one direction for long periods of time. We develop a new statistical model of exchange rate dynamics as a sequence of stochastic, segmented time trends and estimate parameters and test hypotheses for this framework. We reject the hypothesis that exchange rates follow a random walk in favor of our model of long swings. Our model also generates better forecasts than a random walk does. We conclude that persistent movement in the value of the dollar calls for greater attention in the theory of exchange rate behavior.

Our model is a natural framework for assessing the importance of the "peso problem" for the dollar. It allows for the expectation of future exchange rates to be influenced by the probability of a change in regime. We nonetheless reject uncovered interest parity. The forward premium frequently appears to put too high a probability on a change in regime.

Measuring 1992's Medium-Term Dynamic Effects

Richard E. Baldwin
Working Paper No. 3166
November 1989

This paper explicitly models the link between the 1992 market liberalization and the aggregate marginal productivity of European Community capital. It shows that the liberalization is likely to lead to a ceteris paribus rise in the marginal product of capital and thereby to raise the steady-state capital/labor ratio. I also roughly quantify the comparative steady-state impact of 1992.

The Impact of Industrial Relations Legislation on British Union Density

Richard B. Freeman and **Jeffrey Pelletier**
Working Paper No. 3167
November 1989

The unionized share of the work force changed markedly in the United Kingdom between the 1970s and 1980s. In the 1970s, density rose steadily, making the United Kingdom the most heavily organized large OECD country. In the 1980s, by contrast, density fell by 1.4 percentage points per year—a faster drop than in the rapidly deunionizing United States or in Japan. What explains this turnaround—the severe recession of the 1980s? Shifts in the composition of employment from unionized manufacturing to services? The Thatcher government's industrial relations legislation?

This paper investigates these questions with a quantitative analysis of 1945–86 changes in British union density. In contrast to studies that concentrate on cyclical determinants of unionism (Bain and Elshiekh, Carruth and Disney, Booth [1983]) we focus on industrial relations legislation. We develop an index of the favorableness of labor laws to unionism and relate it to changes in density in time-series regressions that control for inflation, unemployment, and the manufacturing share of employment, among other variables. As a further test, we develop an analogous labor law index for Ireland, whose industrial relations system is similar to the United Kingdom's and that experienced a similar severe 1980s recession but that did not pass new laws to weaken unions. We contrast changes in density among the countries with differences in industrial relations law. Our major finding is that *the Thatcher government's labor laws caused much of the 1980s fall in British union density.*

Two Tools for Analyzing Unemployment

Olivier Jean Blanchard
Working Paper No. 3168
November 1989
JEL Nos. 131, 820

This paper shows how one can interpret the joint movements of wages, unemployment, and vacancies in the Phillips and Beveridge spaces to learn about the origins of the movements in unemployment. The view of the labor market underlying the conceptual framework emphasizes flows, matching, and Nash bargaining determination of wages. I use the approach to analyze the movements in unemployment in the United States, the United Kingdom, and in Germany over the last 20 years.

Equity Issues and Stock Price Dynamics

Deborah J. Lucas and **Robert L. McDonald**
Working Paper No. 3169
November 1989
JEL Nos. 313, 521

This paper presents an information-theoretic, infinite-horizon model of the decision to issue equity. The

model's predictions about stock price behavior and timing of issues explain most of the stylized facts in the empirical literature: 1) on average, equity issues are preceded by an abnormal positive return on the stock, although there is considerable variation across firms; 2) equity issues on average also are preceded by an abnormal rise in the market; and 3) the stock price drops significantly at the announcement of an issue. In this model, the price drop at announcement of the issue is uncorrelated with the social cost of suboptimal investment caused by asymmetric information; the welfare loss may be small even if the price drop is large.

Understanding Stock Price Behavior Around the Time of Equity Issues

Robert A. Korajczyk, Deborah J. Lucas, and **Robert L. McDonald**
Working Paper No. 3170
November 1989
JEL Nos. 313, 521

It is well documented that stock prices rise significantly prior to an equity issue and fall upon announcement of the issue. We expand on earlier studies by using a large sample that includes OTC firms, by examining the cross-sectional properties of the price rise, and by using accounting data to track the pattern of debt ratios and Tobin's q around the time of equity issues. We consider a number of explanations for our results and conclude that the data are largely consistent with informational models in which managers are informed asymmetrically about the value of the firm. Surprisingly, debt ratios do not increase prior to equity issues, suggesting that strained debt capacity is not the main reason for equity issues. The behavior of Tobin's q is consistent with equity issues being used to finance new investments.

Bull and Bear Markets in the Twentieth Century

Robert B. Barsky and **J. Bradford De Long**
Working Paper No. 3171
November 1989
JEL No. 310

The major bull and bear markets of this century have suggested to many that large decade-to-decade stock market swings reflect irrational "fads and fashions" that periodically sweep investors. We argue instead that investors have perceived significant shifts in the long-run mean rate of future dividend growth and that stock prices depend sufficiently sensitively on expectations about the underlying future growth rate that these perceived shifts plausibly would generate large swings like those of the twentieth century. We go on to document that analysts who often have been viewed as "smart money" held assessments of fundamental values based on their perceptions of future economic growth and technological progress; the judgments of these analysts, like the assessments of fundamentals we generate from simple dividend growth forecasting rules, track the major decade-to-decade swings in the market rather closely.

A New Monthly Index of Industrial Production, 1884-1940

Jeffrey A. Miron and **Christina D. Romer**
Working Paper No. 3172
November 1989
JEL Nos. 131, 042, 220

This paper derives a new monthly index of industrial production for the United States for 1884–1940. This index improves upon existing measures of industrial production by excluding indirect proxies of industrial activity, by using only component series that are consistent over time, and by not making ad hoc adjustments to the data. Analysis of the new index shows that it has more within-year volatility than conventional indexes, has relatively unimportant seasonal fluctuations, and has cyclical turning points that are grossly similar but subtly different from existing series.

Human Capital and Growth: Theory and Evidence

Paul H. Romer
Working Paper No. 3173
November 1989
JEL No. 110

This paper outlines a theoretical framework for considering the role of human capital in a model of endogenous growth. The framework pays particular attention to two questions: What are the theoretical differences between such intangibles as education and experience on the one hand, and knowledge or science on the other? And, how do knowledge and science actually affect production? One implication derived from

this framework is that the initial level of a variable such as literacy may be important for understanding subsequent growth. This emphasis on the level of an input contrasts with the usual emphasis from growth accounting on rates of change of inputs. The principal empirical finding is that literacy has no additional explanatory power in a cross-country regression of growth rates on investment and other variables; but consistent with the model, the initial level of literacy does help predict the subsequent rate of investment, and indirectly, the rate of growth.

Prices During the Great Depression: Was the Deflation of 1930-2 Really Unanticipated?

Stephen G. Cecchetti
Working Paper No. 3174
November 1989
JEL Nos. 023, 041, 310

Several explanations for the depth of the Great Depression presume that the 30 percent deflation of 1930-2 was unanticipated. For example, the debt-deflation hypothesis originally put forth by Irving Fisher is based on the notion that unanticipated deflation increases the burden of nominal debt, adversely affecting the banking system and the aggregate economy. Other theories rely on ex ante real interest rates being low during the period, and so it is essential that the deflation was unanticipated.

This paper measures inflationary expectations from data on prices, interest rates, and money growth. I use current econometric techniques to compute expectations implied both by the univariate time-series properties of the price level, and by the information contained in nominal interest rates. I conclude that price changes were substantially serially correlated, so that once the deflation began, people expected it to continue. This implies both that the deflation was anticipated and that real interest rates were very high during the initial phases of the Great Depression. These results call into question the validity of theories that rely on contemporary agents' belief in reflation during the early 1930s, and provide further support for the proposition that monetary contraction was the driving force behind the economic decline.

The Aggregate Matching Function

Olivier Jean Blanchard and **Peter Diamond**
Working Paper No. 3175
November 1989
JEL Nos. 131, 820

We present a picture of the labor market with large flows of jobs and workers, and matching. We develop a consistent approach to the interaction among those flows and the stocks of unemployed workers and vacant jobs, and to the determination of wages. We estimate the matching function, using both aggregate data and data from manufacturing and find evidence of a stable matching process in the data. We examine the joint movements in unemployment, vacancies, and wages —the Beveridge and Phillips curve relationships—in light of our model. We conclude that aggregate activity shocks, rather than reallocation shocks, dominate the movement of unemployment.

Procompetitive Effects of Trade Reform: Reform from a CGE Model of Cameroon

Shantayanan Devarajan and **Dani Rodrik**
Working Paper No. 3176
November 1989
JEL No. 422

How likely is trade liberalization to produce efficiency gains in the presence of imperfect competition, scale economies, and higher-than-average wages in the modern sectors, all common features of developing economies? These features create a potential conflict, since traditional notions of comparative advantage would lead us to expect that the modern sectors will be squeezed with liberalization.

We investigate the issue by using an applied general equilibrium model calibrated to data from Cameroon. Under perfect competition, the traditional expectations are borne out: manufacturing sectors on the whole contract and the cash crops sector (mainly coffee and cocoa) is the main beneficiary. The welfare effect is a wash, since the beneficial consequence of expanded imports is offset by labor being pulled away from the modern, high-wage sectors.

By contrast, under imperfect competition (in the modern sectors only), trade liberalization produces welfare gains of the order of 1 to 2 percent of real income. The key is the procompetitive effect of liberalization: domestic firms now perceive themselves as facing a higher elasticity of demand, which spurs them to increase production. Therefore, the modern sectors do much better in terms of output than in the perfectly competitive benchmark.

The introduction of scale economies amplifies these results. Under reasonable circumstances, imperfect competition will make liberalization more desirable, even in the absence of firm entry and exit.

Business Cycles and Fertility Dynamics in the United States: A Vector-Autoregressive Model

Naci H. Mocan
Working Paper No. 3177
November 1989
JEL No. 841

Using recent developments in time-series econometrics, this paper investigates the behavior of fertility over the business cycle. The sex-specific unemployment rates, the divorce rate, and the fertility rate are governed by stochastic trends. Furthermore, fertility is co-integrated with the divorce and unemployment rates.

In the bivariate vector autoregressions between fertility and unemployment, an increase in the female or male unemployment rates generates a decrease in fertility. This confirms the findings of previous time-series research concerning the procyclical behavior of fertility. However, when the models include the divorce rate and the proportion of young marriages as additional regressors, shocks to the unemployment rates bring about an increase in fertility, implying the countercyclicality of fertility.

The "Gold Standard Paradox" and Its Resolution

Willem H. Buiter and **Vittorio U. Grilli**
Working Paper No. 3178
November 1989
JEL No. 431

This paper analyzes Krugman's contention that there is a "gold standard paradox" in the literature on speculative attacks. The paradox occurs if a country's currency appreciates after it runs out of gold, or if a speculative attack can occur only after the country "naturally" runs out of reserves. We show first that Krugman's paradox is a very general phenomenon; it does not require mean-reverting processes for the fundamentals, and it can be present in discrete-time models as well as in continuous-time models. We present several specific cases in which the paradox occurs; that is, environments that do not support an equilibrium. Next we show that, contrary to Krugman's conjecture, it is not necessary to abandon the assumption of a perfectly fixed exchange rate in favor of a band system in order to recover a well-defined equilibrium. We propose two ways of amending the model that produce an equilibrium *and* preserve the fixed exchange rate assumption.

Insider Power in Wage Determination

David G. Blanchflower, Mario D. Garrett, and **Andrew J. Oswald**
Working Paper No. 3179
November 1989

We argue that wage determination is best seen as a kind of rent sharing in which workers' bargaining power is influenced by conditions in the external labor market. We use British establishment data from 1984 to show that pay depends upon a blend of insider pressure (including the employer's financial performance and oligopolistic position) and outsider pressure (including external wages and unemployment). Lester's feasible "range" of wages typically appears to be between 8 percent and 22 percent of pay. Estimates of the unemployment elasticity of the wage lie in a narrow band around -0.1.

Unionization and Employment Behavior

David G. Blanchflower, Neil Millward, and **Andrew J. Oswald**
Working Paper No. 3180
November 1989

Although an extensive literature exists on the effects of trade unions on wages, there is no published work that uses microeconomic data to examine the employment consequences of unionization. This paper addresses that issue with a new British dataset and shows that, even after the addition of a substantial set of control variables, there is a strong association between poor employment performance and the presence of trade unions. The union employment growth differential is estimated at approximately -3 percent per annum.

The Wage Curve

David G. Blanchflower and **Andrew J. Oswald**
Working Paper No. 3181
November 1989

This paper, which follows in a London School of Economics tradition begun by Phillips and Sargan, examines the role of unemployment in shaping pay. In contrast to most of the literature, it uses microeconometric data on individuals and workplaces; examines a variety of datasets as a check on the robustness of results; and studies the effects of unemployment on the real wage level (not on the rate of change of pay or prices). In British and U.S. data, we find evidence of a wage curve. The curve has a negative gradient at low levels of em-

ployment but becomes horizontal at relatively high levels of unemployment.

Does Unmeasured Ability Explain Interindustry Wage Differences?

Robert S. Gibbons and **Lawrence F. Katz**
Working Paper No. 3182
November 1989

This paper empirically assesses the two leading explanations of measured interindustry wage differentials: 1) true wage differentials exist across industries; and 2) the measured differentials simply reflect unmeasured differences in workers' productive abilities. First we summarize the existing evidence on the unmeasured-ability explanation, which is based on first-differenced regressions using matched Current Population Survey (CPS) data. We argue that these existing approaches implicitly hypothesize that unmeasured productive ability is rewarded equally in all industries. Second, we construct a simple model in which unmeasured ability is *not* valued equally in all industries; instead, there is matching. This model illustrates two problems of endogeneity inherent in the first-differenced regressions using CPS data: whether a worker changes jobs is endogenous, as is the industry of the new job the worker finds. Third, we propose two new empirical approaches designed to minimize these endogeneity problems. We implement these procedures on a sample that allows us to approximate the experiment of exogenous job loss: a sample of workers displaced by plant closings. We conclude from our findings using this sample that neither of the contending explanations fits the evidence without recourse to awkward modifications, but that a modified version of the true-industry-effects explanation fits more easily than any existing version of the unmeasured-ability explanation does.

Economic Analysis and the Political Economy of Policy Formation

Michael Bruno
Working Paper No. 3183
November 1989

The first part of this paper analyzes the various components (as well as likely failures) in the complex two-way market chain that links the supply of economic theories with the design, sale, and implementation of workable economic policies. Among other aspects of this link, we stress two points. One is the relative contribution to knowledge of economists inside the government machine, which by nature often is not diffused to the profession at large. Another very major point is the advancement of knowledge through the reverse link from policies that have worked in practice, often without prior theoretical grounding, to their subsequent rigorous theoretical formulation and empirical testing.

This discussion is followed by detailed firsthand illustrations from the politicoeconomic experience of Israel, in which government (and economists') involvement in the economy has traditionally been far-reaching. The illustrations, which have their parallels in other countries, are given in historical order, from the contributions to the literature on trade and development policy issues (paramount in the 1950s and 1960s), on tax and transfer schemes, and on open economy macro policies and exchange rate regimes (mainly in the 1970s). This is followed by reference to the policy experience and failures of living with high inflation and, in particular, the political economy of the more recent stabilization efforts that provide considerable support for the general points made in the first part of the paper on the workings of the market for ideas and policies.

The paper ends with brief references to two important topics for the 1990s: the uncharted practical area of institutional reform in socialist economies and the recent theoretical literature on game-theoretic approaches to policy formation.

Interstate Business Tax Differentials and New Firm Location: Evidence from Panel Data

Leslie E. Papke
Working Paper No. 3184
November 1989
JEL No. 320

This paper examines the impact of state and local tax differentials on the location of industry. I also develop an industry- and year-specific series of effective tax rates for each state. After controlling for state and industry effects, I find that a high marginal effective state tax rate reduces the number of firm startups for most industries examined.

Transitional Dynamics and Economic Growth in the Neoclassical Model

Robert G. King and **Sergio T. Rebelo**
Working Paper No. 3185
November 1989
JEL No. 111

In this paper, we undertake a systematic *quantitative* investigation of transitional dynamics within the

most widely employed versions of the neoclassical model with intertemporally optimizing households. Lengthy transitional episodes arise only if there is very low intertemporal substitution, But, more importantly, we find that the simplest neoclassical model inevitably generates a central implication that is traced to the production technology. Whenever we try to use it to explain major growth episodes, the model produces a rate of return that is counterfactually high in the early stages of development. For example, in seeking to account for U.S.-Japan differences in postwar growth as a consequence of differences in end-of-war capital, we find that the immediate postwar rate of return in Japan would have had to exceed 500 percent per annum.

Frequently employed variants of the basic neoclassical model—those that introduce adjustment costs, separate production and consumption sectors, and international capital mobility—potentially can sweep this marginal product implication under the rug. However, such alterations necessarily cause major discrepancies to arise in other areas. With investment adjustment costs, for example, the implications resurface in counterfactual variations in Tobin's *Q*.

We interpret our results as illustrating two important principles. First, systematic quantitative investigation of familiar models can provide surprising new insights into their practical operation. Second, explanation of sustained cross-country differences in growth rates will require departure from the familiar neoclassical environment.

The Declining Economic Position of Less-Skilled American Males

McKinley L. Blackburn, David E. Bloom, and **Richard B. Freeman**
Working Paper No. 3186
November 1989

This paper documents the substantial decline in the economic position of less-skilled American males that has occurred since the early 1970s. It also explores potential explanations for the widening of earnings differentials between more- and less-educated white males. On the basis of these analyses, we draw four main conclusions.

First, industrial shift and deunionization account for noneligible portions of the overall increase in educational wage differentials that occurred in the 1980s. Among 25-64-year-olds, these effects are offset by changes in the relative supply of college graduates, which acted to reduce differentials. Among 25-34-year-olds, in contrast, changes in relative supply add to our ability to explain the widening of wage gaps. As a result, we are modestly successful in explaining the growth of wage differentials between educational groups in the 1980s for males aged 25-34 but are largely unsuccessful in explaining the growth in wage differentials for males aged 25-64.

Second, we have greater success in explaining the change in the growth rate of wage differentials between the 1970s and 1980s. Here we find that movements in relative supply, which differed sharply between the 1970s and 1980s, by themselves can account for much of the accelerated pace of change in the wage gaps. This factor operates similarly for 25-64- and 25-34-year-olds, since the relative supply of college graduates in both age groups decelerated from the 1970s to the 1980s.

Third, the 1970s and 1980s differed importantly in ways not captured by our analyses. Since we are able to measure labor supply and institutional changes reasonably well, we can infer that outward shifts in the relative demand for college graduates, caused by factors we were unable to measure, accelerated in the 1980s.

Fourth, we find little evidence that the recent widening of wage gaps across educational groups is caused by: 1) the 1980s decline in the real value of the minimum wage; 2) the increased pace of technological change; 3) changes in the labor supply of white males below age 25 and of women in different educational groups; or 4) changes over time in the quality of less-educated workers.

Do Union Wealth Concessions Explain Takeover Premiums? The Evidence on Contract Wages

Joshua Rosett
Working Paper No. 3187
November 1989
JEL Nos. 800, 500

I estimate changes in levels of union real wage growth associated with corporate takeovers and accompanying changes in chief executive officers. The effects are statistically insignificant. I use the results to construct union wealth changes associated with corporate control events. I estimate target firm shareholder wealth premiums using a simple market model. I compare the union and shareholder wealth changes and conclude that transfers of wealth from unions to shareholders are not an economically significant explanation of shareholder wealth premiums.

Real Wage Determination in Collective Bargaining Agreements

Louis N. Christofides and **Andrew J. Oswald**
Working Paper No. 3188
November 1989

This paper studies the determinants of real wage rates using data on Canadian labor contracts signed

between 1978 and 1984. Its results are consistent with Dunlop's neglected (1944) hypothesis that real pay movements are shaped by product changes (contrary to the predictions of implicit contract theory and other models of wage inflexibility). The level of the unemployment rate lowers the real wage level with an elasticity between -0.04 and -0.13, whereas a Phillips curve specification that relates wage changes to the level of the unemployment rate is not supported convincingly by the data. These results are consistent with the view that collective bargaining is a form of rent-sharing in which external unemployment weakens workers' bargaining strength.

Financial Development, Growth, and the Distribution of Income

Jeremy Greenwood and **Boyan Jovanovic**
Working Paper No. 3189
November 1989

This paper presents a paradigm in which both the extent of financial intermediation and the rate of economic growth are determined endogenously. Financial intermediation promotes growth because it allows a higher rate of return to be earned on capital; in turn, growth provides the means to implement costly financial structures. Thus, financial intermediation and economic growth are linked inextricably in accord with the Goldsmith-McKinnon-Shaw view of economic development. The model also generates a development cycle reminiscent of the Kuznets hypothesis. In particular, in the transition from a primitive, slow-growing economy to a developed, fast-growing one, a nation passes through a stage in which the distribution of wealth across the rich and poor widens.

Externalities and Growth Accounting

Jess Benhabib and **Boyan Jovanovic**
Working Paper No. 3190
December 1989

We reexamine several bodies of data on the growth of output, labor, and capital, within the context of a model that admits the possibility of an externality to the capital input. The model is an augmented version of Paul Romer's (1987) reformulation of the Solow model. Unlike Romer, however, we find no evidence of an externality to capital. This finding implies nothing about the size of possible spillovers in the creation of knowledge because, in our model, causality runs exclusively from knowledge to capital.

Predictable Stock Returns in the United States and Japan: A Study of Long-Term Capital Market Integration

John Y. Campbell and **Yasushi Hamao**
Working Paper No. 3191
December 1989
JEL No. 430

This paper studies the predictability of monthly excess returns on equity portfolios over the domestic short-term rate in the United States and Japan from 1971:1-1989:3. We find that similar variables, including the dividend-price ratio and interest rate variables, help to forecast excess returns in both countries. In addition, in the 1980s U.S. variables help to forecast excess Japanese stock returns. There is evidence of common movement in expected excess returns across the two countries, which is suggestive of integration of long-term capital markets.

Market Responses to Coordinated Central Bank Intervention

Kathryn Mary Dominguez
Working Paper No. 3192
December 1989
JEL No. 431

The scale of unilateral and uncoordinated intervention in the foreign exchange market by the G-5 countries has become considerably larger over the last few years, following a period in which official U.S. policy was opposed to intervention. This paper examines market responses to official sterilized central bank intervention policy from 1985-7.

I hypothesize that the efficacy of sterilized intervention depends on the market's belief that central banks have both "inside" information about future monetary policy and the incentive to reveal that information truthfully through intervention signals. Central banks may agree to coordinate their intervention operations in order to influence the market's perception of the relative importance and credibility of its own signals.

I econometrically examine market responses to intervention from 1985-7, using heretofore unavailable daily data on G-3 unilateral and coordinated intervention operations. The empirical evidence indicates that: 1) even though daily intervention data are not published, market participants essentially were able to contemporaneously observe the source and magnitude of central bank intervention operations; 2) unilateral intervention significantly influenced market expectations in some period; and 3) coordinated intervention had a significantly different and longer-term influence on market expectations than did unilateral intervention over the three-year period examined.

Signaling and Accounting Information

Stewart C. Myers
Working Paper No. 3193
December 1989

This paper develops a signaling model in which accounting information improves real investment decisions. Pure cash flow reporting leads to underinvestment when managers have superior information but are acting in shareholders' interests. Accounting by prespecified, "objective" rules alleviates the underinvestment problem.

Explaining Japan's Innovation and Trade: A Model of Quality Competition and Dynamic Comparative Advantage

Gene M. Grossman
Working Paper No. 3194
December 1989
JEL No. 430

In this paper, I develop a model of dynamic comparative advantage based on endogenous innovation. Firms in each of two countries devote resources to R and D in order to improve the quality of high technology products. Research successes generate profit opportunities in the world market. The model predicts that a country such as Japan, with abundance of skilled labor and scarcity of natural resources, will specialize relatively in industrial innovation and in the production of high technology goods. The provided data support this prediction. I use the model to explore the effects of R and D subsidies, production subsidies, and trade policies on the long-run rates of innovation in trade partner countries and on the long-run pattern of trade.

Time-Series Tests of a Nonexpected Utility Model of Asset Pricing

Alberto Giovannini and **Philippe Jorian**
Working Paper No. 3195
December 1989

This paper provides two procedures for estimating and testing a representative-agent model of asset pricing that relies on a particular parameterization of nonexpected utility preferences. The first procedure is based on maximum-likelihood estimates, supplemented with an explicit model of time-varying first and second moments. The second procedure is based on generalized method-of-moments estimates.

We perform our tests on a dataset that includes monthly observations of rates of return on U.S. stock prices and U.S. consumption of nondurables and services. Our results are directly comparable to a test of the dynamic capital asset pricing model performed by Hansen and Singleton (1983), and to a test of the model we study that was performed by Epstein and Zin (1989).

Saving and Liquidity Constraints

Angus Deaton
Working Paper No. 3196
December 1989

This paper concerns the theory of saving when consumers are not permitted to borrow, and how such a theory explains some stylized facts of saving behavior. When consumers are relatively impatient, and when labor income is distributed independently and identically over time, assets act like a buffer stock, protecting consumption against bad draws of income. The precautionary demand for saving interacts with the borrowing constraints to provide a motive for holding assets. If the income process is positively autocorrelated but stationary, then assets still are used to buffer consumption but do so less effectively and at a greater cost in terms of foregone consumption. In the limit, when labor income is a random walk, it is optimal for consumers who are impatient and liquidity constrained simply to consume their incomes. As a consequence, a liquidity-constrained representative agent cannot generate aggregate U.S. saving behavior if that agent receives aggregate labor income. Either there is no saving, when income is a random walk, or saving is contracyclical over the business cycle, when income changes are positively autocorrelated. However, in reality, microeconomic income processes do not resemble their average, and it is possible to construct a model of microeconomic saving under liquidity constraints that, at the aggregate level, reproduces many of the stylized facts in the actual data. While it is clear that many households are not liquidity constrained, and do not behave as described here, the models presented in the paper seem to account for important aspects of reality that are not explained by traditional life-cycle models.

The Effects of Mergers on Prices, Costs, and Capacity Utilization in the U.S. Air Transportation Industry, 1970–84

Frank R. Lichtenberg and **Moshe Kim**
Working Paper No. 3197
December 1989
JEL Nos. 610, 635, 825

We analyze the effect of mergers on various aspects of airline performance from 1970–84, using a panel dataset constructed by Caves et al. Estimates derived from a simple "matched pairs" statistical model indicate that these mergers were associated with reductions in unit cost. The average annual rate of growth of unit cost of carriers undergoing merger was 1.1 percentage points lower, during the five-year period centered on the merger, than that of carriers not involved in merger. Almost all of this cost reduction appears to have been passed on to consumers. Part of the cost reduction is attributable to merger-related declines in the prices of inputs, particularly labor, but about two-thirds of it is caused by increased total factor productivity. One source of the productivity improvement is an increase in capacity utilization.

Wages, Prices, and Labor Markets before the Civil War

Claudia Goldin and **Robert A. Margo**
Working Paper No. 3198
December 1989
JEL Nos. 040, 824

This paper tests two opposing views of the antebellum economy. One is that aggregate economic activity was severely diminished, and that there was substantial and prolonged unemployment during several downturns. The alternative interpretation is that antebellum fluctuations were more apparent than real; nominal wages, not labor quantities, did most of the adjusting.

We analyze data on real wages for laborers, artisans, and clerks across four regions (northeast, north central, south Atlantic, and south central) for 1821–56. Various time-series econometric methods reveal that shocks to real wages persisted even five years after an innovation, but that their impact vanished eventually. The persistence of shocks was less for agricultural labor than for other occupations, less for growing regions than for more mature ones, less for unskilled than for skilled labor, and probably less before 1860 than after. Although nominal wages and prices never strayed far from each other over the long run, there was considerable persistence of shocks in 1821–56. Therefore, we find evidence to support the first view of the antebellum economy, although the degree of unemployment in cities and industrial towns remains unknown.

Seigniorage and Political Instability

Alex Cukierman, Sebastian Edwards, and **Guido Tabellini**
Working Paper No. 3199
December 1989
JEL Nos. 400, 300

The importance of seigniorage relative to other sources of government revenue differs markedly across countries. The main theoretical implication of this paper is that countries with more unstable and polarized political systems rely more heavily on seigniorage.

We obtain this result in the context of a political model of tax reform. The model implies that the more unstable and polarized the political system is, the more inefficient is the equilibrium tax structure (in the sense that tax collection is more costly to administer), and therefore, the more reliance there is on seigniorage. We test this prediction of the model on cross-sectional data for 79 countries. We find that, after controlling for other variables, political instability contributes significantly to explaining the fraction of government revenue derived from seigniorage. This finding is very robust. We also find that seigniorage is related positively to political polarization, even though the evidence is weaker because of difficulties in measuring polarization.

Alcohol Consumption and Tax Differentials among Beer, Wine, and Spirits

Henry Saffer
Working Paper No. 3200
December 1989
JEL No. 913

Several public health interest groups in the United States recently have called for equalization of the federal tax on a unit of alcohol in beer, wine, and spirits. This paper provides some new empirical evidence of the effect of alcohol tax differentials on total alcohol consumption. The data indicate that the greatest decrease in alcohol consumption results from an increase in taxes on spirits, followed by taxes on beer and then taxes on wine. This suggests that the existing, generally accepted, taxation policy of placing the highest tax on spirits, a lower tax on beer, and the lowest tax on wine, results in the greatest reduction in total alcohol consumption.

Quality Ladders and Product Cycles

Gene M. Grossman and **Elhanan Helpman**
Working Paper No. 3201
December 1989

We develop a two-country model of endogenous innovation and imitation in order to study the interactions between these two processes. Firms in the north race to bring out the next generation of a set of technology-intensive products. Potentially, each product can be improved an infinite number of times, but quality improvements require the investment of resources and entail uncertain prospects of success. In the south, entrepreneurs invest resources in order to learn the production processes that have been developed in the north. All R and D investment decisions are made by forward-looking, profit-maximizing entrepreneurs. The steady-state equilibrium has constant aggregate rates of innovation and imitation. We study how these rates respond to changes in the sizes of the two regions and to policies in each region to promote learning.

Taxation, Corporate Capital Structure, and Financial Distress

Mark Gertler and **R. Glenn Hubbard**
Working Paper No. 3202
December 1989

Is corporate leverage excessive? Does the tax code distort corporate capital structure decisions in a way that increases the possibility of an economic crisis of "financial instability"?

In this paper, we describe the cases for and against the trend toward high leverage and evaluate the role played by taxation. While proper incentives to managers in part may underlie the trend to the debt, high leverage in practice may be a blunt way to address the problem, and one that opens up the possibility of undue exposure to the risks of financial distress.

We assume the kinds of managerial incentive problems deemed important by advocates of leverage. However, we maintain that when a firm is subject to business-cycle risk as well as individual risk, a profit-maximizing arrangement is not simple debt, but rather a contract with mixed debt and equity features. That is, the contract should index the principal obligation to aggregate and/or industry-level economic conditions.

We argue that the tax system encourages corporations to absorb more business-cycle risk than they would otherwise. It does so in two respects: first, it provides a relative subsidy to debt finance; second, it restricts debt for tax purposes from indexing the principal to common disturbances. At a deeper level, the issue hinges on the institutional aspects of debt renegotiation. If renegotiation were costless, then debt implicitly would have the equity features relevant for responding to business-cycle risk. However, because of the diffuse ownership pattern of much of the newly issued debt and also because of certain legal restrictions, renegotiation is likely to be a costly activity.

The Role of World War II in the Rise of Women's Work

Claudia Goldin
Working Paper No. 3203
December 1989
JEL Nos. 040, 824

The 1940s were a turning point in the labor force participation of married women, leading many to credit World War II with spurring economic and social change. This paper uses information from two retrospective surveys, one in 1944 and another in 1951, to resolve the role of World War II in the rise of women's paid work.

More than 50 percent of all married women working in 1950 had been working in 1940; more than half of the decade's new entrants joined the labor force after the war. Of those women who entered the labor force during the war, almost half left before 1950. Employment during World War II did not enhance a woman's earnings in 1950, consistent with most hypotheses about the war. Women in 1950 tended to be in the labor force and in the same occupations during the turbulent 1940s, similar to the findings for the periods before and after. World War II had several significant indirect impacts on women's employment, but much less direct influence.

The Long-Run Behavior of Velocity: The Institutional Approach Revisited

Michael D. Bordo and **Lars Jonung**
Working Paper No. 3204
December 1989
JEL No. 311

Using annual data for 1880–1986, we show that institutional variables are significant determinants of velocity in the United States, United Kingdom, Canada, Sweden, and Norway. This evidence supplements our earlier findings (Bordo and Jonung [1987]) based on annual data ending in the early 1970s.

Our evidence suggests several proxies for institutional change in the financial sector are significant determinants of long-run velocity. For the majority of countries, the long-run velocity function incorporating institutional determinants has not undergone significant change over the last 10–15 years. Out-of-sample forecasts over the last 10–15 years, based on our institutional hypothesis, are superior to those based on a benchmark long-run velocity function for a number of countries.

These results suggest that failure to account for institutional change in the financial sector, which may be captured by our proxy variables, may be one factor behind the recently documented instability and decline in predictive power of short-run velocity models incorporating dynamic adjustment and higher frequency data.

Japan's Saving Rate: New Data and Reflections

Fumio Hayashi
Working Paper No. 3205
December 1989
JEL Nos. 110, 220

This paper examines the available evidence on wealth accumulation in Japan. Time-series evidence for the last hundred years indicates that the phenomenon of extraordinarily high Japanese saving rates was limited to the high-growth era of 1965–75. Micro evidence about consumption and saving by age can be explained more easily by the dynasty model than by the life-cycle hypothesis. The infinite-horizon neoclassical growth model, while capable of generating the hump in the saving rate and explaining why it was preceded by the rapid GNP growth in the postwar period, leaves unanswered the question of why wealth accumulation in prewar Japan was so slow. Perhaps growth in prewar Japan was hampered by harmful effects of misguided government policies.

Oligopolistic Pricing and the Effects of Aggregate Demand on Economic Activity

Julio J. Rotemberg and **Michael Woodford**
Working Paper No. 3206
December 1989

We construct a dynamic general equilibrium model in which the typical industry colludes by threatening to punish deviations from an implicitly agreed-upon pricing path. We argue that models of this type are better at explaining how the economy responds to aggregate demand shocks than competitive models are. When we calibrate a linearized version of the model, using methods similar to those of Kydland and Prescott (1982), we obtain predictions concerning the economy's response to changes in military spending that are close to the response we estimate with postwar U.S. data.

Human Capital Responses to Technological Change in the Labor Market

Jacob A. Mincer
Working Paper No. 3207
December 1989

In a broad sense, there is a reciprocal relationship between human capital and economic growth. This study focuses more narrowly on the labor market consequences of adjustments in human capital to the pace of technological change.

Using Jorgenson's multifactor productivity growth indexes for industrial sectors in the 1960s and 1970s, I explore the effects of the differential pace of technological change on industry demands for educated and trained workers. I use Panel Survey of Income Dynamics (PSID) data covering 1968–83.

I find relative increases both in quantity demanded (utilization) and in price (wages) of skilled workers in the more progressive sectors. Steeper wage profiles, less turnover, and less unemployment characterize labor in sectors in which productivity grew faster in preceding years. The growth of sectorial capital intensity produces similar effects. But, as newer vintages of capital contain new technology, the skill bias of capital intensity partly reflects the skill bias of technology.

Job Training: Costs, Returns, and Wage Profiles

Jacob A. Mincer
Working Paper No. 3208
December 1989

Using information on time costs of training and gains in wages attributable to training, I compute rates of return on investments in training. The range of estimates based on several datasets generally exceeds the magnitude of rates of return usually observed for investments

in schooling. It is not clear, however, that the difference represents underinvestment in job training.

I use two methods to estimate total annual costs of job training in the U.S. economy for 1958, 1976, and 1987. The "direct" calculation uses information on time spent in training and on wages. For 1976 these costs amounted to 11.2 percent of Total Employee Compensation and half the costs of school education. In the "indirect" method, training costs are estimated from wage functions fitted to Panel Survey of Income Dynamics (PSID) data. In 1976, the direct estimate amounted to between 65 percent and 80 percent of the indirect estimate based on the wage profile. This result strongly supports the human capital interpretation of wage profiles.

The estimates indicate a slower growth of training than of school expenditures in the past decades, probably because of substitution of schooling for job training.

A Simple Proof That Futures Markets Are Almost Always Informationally Inefficient

Ian Gale and **Joseph E. Stiglitz**
Working Paper No. 3209
December 1989
JEL No. 022

Previous work showing that prices could aggregate perfectly the diverse information of traders depended critically on the assumption that all agents had constant absolute risk utility. We show that, in order for the strong form of the efficient market hypothesis to hold generically, either all agents must have constant absolute risk aversion utility, or all must have constant relative risk aversion utility with the same coefficient of relative risk aversion.

Endogenous Technological Change

Paul M. Romer
Working Paper No. 3210
December 1989
JEL No. 110

In this model, growth is driven by technological change arising from intentional investment decisions made by profit-maximizing agents. The distinguishing feature of the technology as an input is that it is neither a conventional good nor a public good; it is a nonrival, partially excludable good. Because of the nonconvexity introduced by a nonrival good, price-taking competition cannot be supported. Instead, the equilibrium involves monopolistic competition.

I conclude that the stock of human capital determines the rate of growth. Too little human capital is devoted to research in equilibrium. Integration into world markets will increase growth rates, and having a large population is not sufficient to generate growth.

The Dynamic Relationship between Low Birthweight and Induced Abortion in New York City: An Aggregate Time-Series Analysis

Theodore J. Joyce and **Michael Grossman**
Working Paper No. 3211
December 1989
JEL No. 841

We use a vector autoregression to examine the dynamic relationship between the race-specific percentage of pregnancies terminated by induced abortion and the race-specific percentage of low-birthweight births in New York City. With monthly data beginning in 1972, we find that induced abortion explains low birthweight for blacks, but not for whites. There is no evidence of feedback from low birthweight to induced abortion. Simulations based on the model reveal that an unanticipated decrease in the percentage of pregnancies terminated by induced abortion results in an increase in the rate of low-birthweight births among blacks. The findings suggest that restrictions on legalized abortion in New York City could worsen birth outcomes among blacks.

Using Production-Based Asset Pricing to Explain the Behavior of Stock Returns over the Business Cycle

John H. Cochrane
Working Paper No. 3212
December 1989

This paper defines *investment returns* as the real returns available by increasing investment marginally in a production process at a certain date, and then reaping the extra output and decreasing investment at the next date in order to leave the production plan for other dates unchanged. This paper compares investment returns to stock returns, in order to explain the forecastability of stock returns by variables related to the business cycle and to explain forecasts of future economic activity from stock returns.

Longitudinal Patterns of Compliance with OSHA Health and Safety Regulations in the Manufacturing Sector

Wayne B. Gray and **Carol Adaire Jones**
Working Paper No. 3213
December 1989
JEL Nos. 619, 820

We examine the impact of OSHA enforcement on company compliance with agency regulations in the manufacturing sector, with a unique plant-level dataset of inspection and compliance behavior during 1972–83, the first 12 years of the agency's operation. For an individual inspected plant, the average effect of OSHA inspections during this period was to reduce expected citations by 3.0, or by 0.36 standard deviation. The total effect of additional inspections on expected citations can be decomposed into two parts: evaluated at the mean of the sample, 59 percent of the total change in citations occurred because of an increase in the compliance rate; 41 percent was caused by a reduction in citations among continuing violators.

Poverty Programs, Initiation of Prenatal Care, and the Rate of Low Birthweight Births

Richard Frank, Catherine Jackson, David Salkever, and **Donna Strobino**
Working Paper No. 3215
December 1989
JEL No. 913

This paper specifies and estimates an econometric model of low and very low birthweight rates for counties in the United States in 1975–84. We focus on how several specific public policy actions affect prenatal care and, subsequently, birthweight. We find strong racial differences in the impact of prenatal care on low birthweight rates. We also find that, for the white population, changes in income eligibility standards and expanded availability of publicly financed maternal and infant clinics have the strongest impacts on low birthweight rates.

Policy Distortions, Size of Government, and Growth

William Easterly
Working Paper No. 3214
December 1989
JEL No. 111

This paper analyzes the structural relationship between policies that distort resource allocation and long-term growth. First it briefly reviews the Solow model in which steady-state growth depends only on exogenous technological change. The paper then proposes an increasing-returns model in the spirit of the new literature on economic growth. With increasing returns, endogenous economic variables—and thus policy—will affect the steady-state rate of growth.

I extend the model to an analysis of the relationship between the size of government and growth. The relationship between tax revenue and growth for alternative tax rates can be positive, negative, or zero. The same is true for the relationship between public and private investment. Changes in the share of tax revenue devoted to capital accumulation ("government saving") will affect the results.

I find that simple linear relationships between distortions and growth, or between size of government and growth, are untenable. Advocates of liberalization and policymakers should consider the structural factors that influence the effect on growth of lowering distortions.

The Impact of Corporate Restructuring on Industrial Research and Development

Bronwyn H. Hall
Working Paper No. 3216
December 1989
JEL Nos. 621, 522, 521

This paper investigates whether the recent wave of corporate restructuring in the United States has had a negative impact on research and development by industrial firms. Using a newly constructed sample of about 2500 manufacturing firms from 1974 to 1987, I examine three major classes of restructuring events: leveraged buyouts and other "going private" transactions; mergers and acquisitions in general; and substantial increases in leverage.

The major conclusions are: First, leveraged buyouts do not occur in R and D-intensive sectors or firms and therefore cannot be having much of an impact on R and D spending. Rather, the evidence seems consistent with an agency cost and cash-flow-driven model of buyouts. Second, major increases in leverage are followed by substantial declines in the R and D intensity of the firms in question, and the effect takes at least three years to work through. Finally, although the evidence on acquisitions by publicly traded firms is mixed, the basic conclusion is that any declines in the R and D intensity of acquiring firms relative to their past history appear to be associated with the leverage structure of the transaction rather than the acquisition itself.

The Demand for Money in the United States during the Great Depression: Estimates and Comparison with the Postwar Experience

Dennis Hoffman and **Robert H. Rasche**
Working Paper No. 3217
December 1989
JEL No. 310

This study investigates the equilibrium demand for a narrowly defined monetary aggregate during the Great Depression. We find evidence in support of a stable demand for real balances, but no evidence to support stable demand functions for real currency and a real monetary base. This is consistent with the Friedman–Schwartz interpretation of this period.

We *do not* reject the hypothesis that the equilibrium demand for real M1 is stable in the pre- and post-World War II sample periods. We find that the "shift in the drift" of M1 velocity after 1945 and at the end of 1981, as well as the "shift in the drift" of currency and base velocities in 1981, is the image of corresponding "shift in the drift" of short-term interest rates. We interpret this as consistent with the hypothesis that the dramatic change in velocity patterns after World War II and in 1981 is a result of changes in inflationary expectations.

Target Zones and Interest Rate Variability

Lars E. O. Svensson
Working Paper No. 3218
December 1989

I examine the trade-off between interest rate variability and the width of an exchange rate target zone. For narrow exchange rate bands and reasonable parameter values, the *asymptotic* variability of the interest rate differential is increasing in the width of the exchange rate band; for wide exchange rate bands, it is slowly decreasing. The *instantaneous* variability of the interest rate differential is decreasing in the width of the exchange rate band. A narrow target zone differs from a completely fixed exchange rate regime in that the instantaneous standard deviation of the interest rate differential is high and even increases when the zone narrows.

When the model is extended to include a realignment/devaluation risk and an endogenous exchange rate risk premium, the risk premium is small for reasonable parameter values and does not matter much.

The Nonneutrality of Inflation for International Capital Movements

Hans-Werner Sinn
Working Paper No. 3219
January 1990
JEL No. 440

This paper studies how unilateral changes in the rate of inflation can affect the international allocation of capital. It presents a model that incorporates a transaction motive for holding money and capital income taxation with historical cost accounting. It counters the view that inflation will be neutral in a world of perfect foresight and costless arbitrage: under mild conditions, domestic inflation will induce a capital export unambiguously. A translation of inflation into nominal interest rates of less than one-to-one is compatible with the model. In fact, the capital export turns out to be stronger as the degree of translation becomes lower.

Participation in a Currency Union

Alessandra Casella
Working Paper No. 3220
January 1990
JEL No. 430

When countries of different sizes participate in a cooperative agreement, the potential gain from deviation determines the minimum power that each country requires in the common decisionmaking. This paper studies the problem in the context of a monetary union —multiple countries sharing a common currency— whose very existence requires coordination of monetary policies. In the presence of externalities in the decentralized equilibrium with national currencies, a small economy in general will require, and will obtain, more than proportional power in the agreement. With a common currency, this is equivalent to a transfer of seigniorage revenues in its favor. With national currencies, such a transfer would not obtain, and the small country would be even more demanding. Without additional unconstrained fiscal instruments, it would be impossible to sustain coordination with fixed exchange rates. When the number of potential countries in the union is large, generally it is not possible to prevent deviations from individual countries or from coalitions. The currency union might emerge as a mixed-strategy equilibrium, but the probability of deviation rises sharply with the number of countries and of possible coalitions.

Money and Business Cycles: A Real Business-Cycle Interpretation

Charles I. Plosser
Working Paper No. 3221
January 1990
JEL Nos. 131, 311

This paper focuses on the role of money in economic fluctuations. While money may play an important role in market economies, its role as an important impulse to business cycles remains highly controversial. For years economists have attempted to construct monetary theories of the business cycle with only limited empirical success. Alternatively, recent real theories of the cycle have taken the view that, to a first approximation, independent variations in the nominal quantity of outside money are neutral. This paper finds only weak empirical evidence for a monetary theory of the cycle. Not only do variations in nominal money explain very little of subsequent movements in real activity, but what explanatory power exists arises from variations in endogenous components of money.

Effects of the Tax Reform Act of 1986 on Corporate Financial Policy and Organizational Form

Roger H. Gordon and **Jeffrey K. MacKie-Mason**
Working Paper No. 3222
January 1990
JEL Nos. 320, 520

We examine the effects of the Tax Reform Act of 1986 on the financial decisions made by firms. We review the theory and empirical predictions of prior literature for corporate debt policy, for dividend and equity repurchase payouts to shareholders, and for the choice of organizational form. We then compare the predictions to post-1986 experience. The change in debt/value ratios has been substantially smaller than expected. Dividend payouts increased as predicted, but stock repurchases increased even more rapidly, which was unexpected and is difficult to understand. Based on very scant data, it appears that some activities have shuffled among organizational forms; in particular, loss activities may have been moved into corporate form in which they are deducted at a higher tax rate, while gain activities may have shifted toward noncorporate form, to be taxed at the lower personal rates.

In addition, we raise several interesting new issues. One concerns previously neglected implications for the effective tax on retained earnings that follow from optimal trading strategies when long- and short-term capital gains are taxed at different rates. Also, new interest allocation rules for multinational corporations provide a substantial incentive for many firms to shift their borrowing abroad.

A Model of Growth Through Creative Destruction

Philippe Aghion and **Peter Howitt**
Working Paper No. 3223
January 1990
JEL No. 022

This paper develops a model based on Schumpeter's process of creative destruction. It departs from existing models of endogenous growth in emphasizing *the obsolescence of old technologies* induced by the accumulation of knowledge and the resulting process or industrial innovations. This has both positive and normative implications for growth. In positive terms, the prospect of a high level of research in the future can deter research today by threatening the fruits of that research with rapid obsolescence. In normative terms, obsolescence creates a negative externality from innovations, and hence a tendency for laissez-fair economies to generate too many innovations: that is, *too much growth*, This "business-stealing" effect is compensated for partly by the fact that innovations tend to be *too small* under laissez-faire.

The model possesses a unique balanced growth equilibrium in which the log of GNP follows a random walk with drift. The size of the drift is the average growth rate of the economy and it is endogenous to the model; in particular it depends on the size and likelihood of innovations resulting from research and also on the degree of market power available to an innovator.

Why Does High Inflation Raise Inflation Uncertainty?

Laurence Ball
Working Paper No. 3224
January 1990
JEL Nos. 023, 134

This paper presents a model of monetary policy in which a rise in inflation raises uncertainty about future

inflation. When inflation is low, there is a consensus that the monetary authority will try to keep it low. When inflation is high, policymakers face a dilemma: they would like to disinflate, but they fear the recession that might result. The public does not know the tastes of future policymakers, and thus does not know whether disinflation will occur.

The Vanishing Harberger Triangle

Hans-Werner Sinn
Working Paper No. 3225
January 1990
JEL Nos. 320, 441

This paper presents a trapped equity model, but instead of asking how taxes affect corporate decisions when a sufficient amount of equity is already in the trap, it asks how the equity gets there. Specifically, I analyze how the double taxation of dividends affects the growth of a corporation that starts with no equity capital. One conclusion is that dividend taxes are distortionary *before* they are paid, but not *when* they are paid. Once the firm is in a stage of maturity, when it pays dividends and dividend taxes, tax neutrality prevails. Thus the true intersectorial distortion resulting from corporate taxation is correlated negatively with the measured tax burden. It is lower, the higher the distortion predicted by Harberger-type estimates. Another conclusion is that the King-Fullerton cost-of-capital formulas do not apply in the case of immature firms. These formulas are based on the assumption that firms distribute their profits from marginal investment projects as dividends. However, immature firms strictly prefer a reinvestment to a distribution of profits. The reinvestment changes the cost of equity capital, and typically this cost is higher than a hasty application of the King-Fullerton formulas would predict.

Joint Crowdout: An Empirical Study of the Impact of Federal Grants on State Government Expenditures and Charitable Donations

Lawrence B. Lindsey and **Richard Steinberg**
Working Paper No. 3226
January 1990

We estimate the effect of exogenous cutbacks in federal expenditures on state social service expenditures and on charitable donations. In the process, we also estimate tax and income effects, and we explore the impact of community environment and "need" variables. The data are a unique three-year panel of aggregate itemized giving by state and income class, and government expenditures by state. Our results confirm the "flypaper effect" of federal grants on state spending. There is a statistically significant but partial crowdout of charitable donations. The flypaper effect appears to dominate the crowdout of donations, so that federal grants are especially productive of overall social service expenditures. Finally, we find that the state's poverty rate is a particularly strong and positive determinant of charitable giving.

An Estimate of a Sectorial Model of Labor Mobility

Boyan Jovanovic and **Robert Moffitt**
Working Paper No. 3227
January 1990
JEL No. 820

This paper develops a model of sectorial labor mobility and tests its main implications. The model nests two distinct hypotheses on the origin of mobility: sectorial shocks (Lucas and Prescott, 1974); and worker-employer mismatch (Jovanovic, 1979; Miller, 1984; Flinn, 1986). We estimate the relative importance of each hypothesis and find that the bulk of labor mobility is caused by mismatch rather than by sectorial shift. We then try to put a value on society's match-specific information. That is, we ask to what extent the availability of the option to change jobs raises GNP. We find that the mobility option raises expected earnings by roughly 8.5 to 13 percent of labor earnings, which translates to an increase in GNP of between 6 percent and 9 percent.

Competition and Human Capital Accumulation: A Theory of Interregional Specialization and Trade

Julio J. Rotemberg and **Garth Saloner**
Working Paper No. 3228
January 1990

We consider a model with several regions whose technological ability and factor endowments are iden-

tical and in which transport costs between regions are nonnegligible. Nonetheless, certain goods sometimes are produced by multiple firms, all of which are located in the same region. These goods then are exported from the regions in which their production is agglomerated. Regional agglomeration of production and trade stems from two forces. First, competition among firms for the services of trained workers is necessary for the workers to recoup the cost of acquiring industry-specific human capital. Second, the technology of production is more efficient when plants are larger than a minimum efficient scale and when local demand is insufficient to support several firms of that scale.

Aggregate Employment Dynamics and Lumpy Adjustment Costs

Daniel S. Hamermesh
Working Paper No. 3229
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JEL Nos. 131, 824

What do aggregate time-series of employment infer, assuming that adjustment at the micro level is discrete because adjustment costs are lumpy? I use various sets of quarterly and monthly data for the United States and impose assumptions about the effect of sectorial dispersion in output shocks on adjustment through aggregation. I find no consistent evidence of any effect of sectorial shocks on the path of aggregate employment.

I then generate artificial aggregate time series from microeconomic processes in which firms adjust employment discretely. These time series produce the same inferences as the actual data. Standard methods of estimating equations describing the time path of aggregate employment yield inferences in the size of adjustment costs that are incorrect and inconsistent with the true differences at the micro level. This simulation suggests that the large literature on employment dynamics based on industry or macro data cannot inform us about the size of adjustment costs, and that such data cannot yield useful information on variations in adjustment costs over time or among countries.

Making Altruism Pay in Auction Quotas

Kala Krishna
Working Paper No. 3230
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With imperfectly competitive product markets, producers react to the auction of quota licenses by adjusting price upward from the free trade level. As a result, license revenues are significantly lower than if markets were perfectly competitive. In fact, they are often zero, unless quotas are very restrictive. In such markets, giving part of these revenues to the producers reduces the incentive to raise product prices and leads to the reappearance of revenues from auctioning quota licenses. With a foreign monopoly and no price discrimination, such a policy can lead to a *Pareto improvement* over free trade. I explore the conditions under which such altruism raises welfare both from free trade and from the status quo.

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