# NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC. WINTER 1987/8

## Program Report

# Developing Country Debt

Jeffrey D. Sachs

NBER's Project on Developing Country Debt seeks to provide a detailed analysis of the ongoing developing country debt crisis. The focus is on the middle-income developing countries, particularly those in Latin America and East Asia, although many lessons of the study should apply as well to the poorer debtor countries in Sub-Saharan Africa.

The project analyzes the crisis from two perspectives: that of the individual debtor country and of the international financial system as a whole. A major goal of the country studies is to understand why some countries, such as Argentina or Mexico, succumbed to a serious crisis, while others, such as Indonesia or Korea, did not. Another important goal is to understand why most of the debtor countries have been unable to overcome the crisis despite many years of harsh economic adjustments.

To analyze such questions, the NBER commissioned eight detailed country monographs, covering four countries in Latin America (Argentina, Bolivia, Brazil, and Mexico) and four countries in the Middle East and East Asia (Indonesia, the Philippines, South Korea, and Turkey). Each study was prepared by a team of two authors: a U.S.-based researcher and an economist from the country under study.[1]

**In This Issue**

Program Report: Developing Country Debt 1
Research Summaries
The Effect of Social Security Financing on National Saving and on Equity 5
Lotteries 7
Further Dollar Depreciation 8
Velocity: Implications for Monetary Policy 11
Economic Outlook Survey 12
NBER Profiles 15
Conferences 17
Conference Calendar 25
Bureau News 26
Bureau Books 32
Current Working Papers 33

This issue of the *Reporter* highlights the Bureau's Project on Developing Country Debt. Next, Michael J. Boskin describes his research in Social Security financing and its effects on national saving and equity; Charles T. Clotfelter discusses his study of state lotteries; Rudiger Dornbusch assesses further depreciation of the dollar; and William Poole explains the implications of velocity for monetary policy. 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.

## Findings of the NBER Studies

There is no single overall implication to emerge from the country studies and systemic analyses, but the historical record belies many of the points commonly made by both the creditors and the debtors. At the risk of some oversimplification, the studies in this project suggest the following major points.

[1] *The papers cited in this and subsequent footnotes are scheduled for publication in one of two volumes edited by J. D. Sachs:* Foreign Debt and Economic Performance: Summary Volume *(indicated as* Summary *in footnotes) or* Foreign Debt and Economic Performance: Special Topics *(indicated as* Special *in footnotes), Chicago: University of Chicago Press, forthcoming 1988. One paper has no text reference in this Program Report: R. Dornbusch, "Debt Problems and the World Macroeconomy," NBER Working Paper No. 2379, September 1987, and in* Special.

The National Bureau of Economic Research is a private, nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers and board of directors are:

Chairman—*Richard N. Rosett*
Vice Chairman—*George T. Conklin, Jr.*
Treasurer—*Charles A. Walworth*

President and Chief Executive Officer—*Martin Feldstein*
Executive Director—*Geoffrey Carliner*
Director of Finance and Administration—*Sam Parker*

DIRECTORS AT LARGE

John Herron Biggs
Andrew Brimmer
Carl F. Christ
George T. Conklin, Jr.
Kathleen B. Cooper
Jean A. Crockett
George C. Eads
Morton Ehrlich
Martin Feldstein
David L. Grove
George Hatsopoulos
Franklin A. Lindsay
Paul W. McCracken
Geoffrey H. Moore
Michael H. Moskow
James J. O'Leary
Robert T. Parry
Peter G. Peterson
Robert V. Roosa
Richard N. Rosett
Bert Seidman
Eli Shapiro
Harold Shapiro
Donald S. Wasserman

DIRECTORS BY UNIVERSITY APPOINTMENT

Charles H. Berry, *Princeton*
James Duesenberry, *Harvard*
Ann F. Friedlaender, *Massachusetts Institute of Technology*
Jonathan R. T. Hughes, *Northwestern*
Saul Hymans, *Michigan*
J. C. LaForce, *California, Los Angeles*
Marjorie B. McElroy, *Duke*
Merton J. Peck, *Yale*
James L. Pierce, *California, Berkeley*
Andrew Postlewaite, *Pennsylvania*
Nathan Rosenberg, *Stanford*
James Simler, *Minnesota*
William S. Vickrey, *Columbia*
Burton A. Weisbrod, *Wisconsin*
Arnold Zellner, *Chicago*

DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Richard A. Easterlin, *Economic History Association*
Edgar Fiedler, *National Association of Business Economists*
Robert S. Hamada, *American Finance Association*
Robert C. Holland, *Committee for Economic Development*
James Houck, *American Agricultural Economics Association*
David Kendrick, *American Economic Association*
Eric Kruger, *The Conference Board*
Rudolph A. Oswald, *American Federation of Labor and Congress of Industrial Organizations*
Douglas D. Purvis, *Canadian Economics Association*
Dudley Wallace, *American Statistical Association*
Charles A. Walworth, *American Institute of Certified Public Accountants*

Contributions to the National Bureau are tax deductible. Inquiries concerning contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

The *Reporter* is issued for informational purposes and has not been reviewed by the Board of Directors of NBER. It is not copyrighted and can be freely reproduced with appropriate attribution of source. Preparation of the *NBER Reporter* is under the supervision of Donna Zerwitz, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138; (617) 868-3900.

The debt crisis arose from a combination of policy actions in the debtor countries and macroeconomic shocks in the world economy. The "unsuccessful" adjusters (all but Indonesia and South Korea among the countries in the NBER study)[2] fell prey to a common pattern of policy actions: chronically large budget deficits; overvalued exchange rates; and a trade regime biased against exports in general and agriculture in particular. These policies would have hindered economic performance in most circumstances, but they provoked a deep crisis when confronted with severe shocks to world interest rates, exchange rates, and commodity prices, in the early 1980s.

Importantly, however, the policy actions in the debtor countries typically were not "mistakes" or technical misjudgments, but the result of a deeper political instability. The economies in Latin America, in particular, are deeply injured by great inequalities of income, which in turn prompts intense political conflict over income distribution. The chronic large budget deficits in these countries do not reflect political irresponsibility so much as political vulnerability. Governments cannot resist the demands for spending from various highly mobilized social groups and at the same time cannot (or choose not to) raise the taxes of the economic elites. Political institutions repeatedly proved too weak to keep the demands for government spending in line with the government's limited tax collections.

In some cases, the political battle can degenerate into a battle of "ins" versus "outs," with the ins using the apparatus of the government for narrow personal gain. The worst excesses of this sort are seen in the Philippines under Marcos, and in many of the Bolivian regimes in the late 1970s and early 1980s.[3]

The experience of South Korea belies the position often taken by the United States and the International Monetary Fund (IMF) and the World Bank, that "small" government (as opposed to effective government) is a key to good economic performance. As the study by Collins and Park makes clear, the government of South Korea played a leading role in organizing economic development. The government was sufficiently powerful, however, to be able to generate significant budget surpluses to finance domestic investment and to pursue a long-term policy of export-led growth. Also, given Korea's relatively equal distribution of income (the result in large part of extensive land reform in the late 1940s and early 1950s), the government was able to devote its attention to matters of efficiency rather than equity.

[2] *W. T. Woo and A. Nasution, "Indonesian Economic Policies and Their Relation to External Debt Management," in* Summary; *and S. M. Collins and W. A. Park, "External Debt and Macroeconomic Performance in Korea," in* Summary.

[3] *R. S. Dohner, "Debt Crisis and Adjustment in the Philippines," in* Summary; *and J. A. Morales and J. D. Sachs, "Bolivia's Economic Crisis," in* Summary.

The historical record also belies the creditors' optimism with respect to rapid adjustment in the face of the debt crisis, but also the debtors' pessimism about the long-run results of adjustment policy. The historical record is rather clear on the long-run benefits of outward-oriented trade policies (although the studies by Edwards and Sachs make clear that outward orientation is not the same as trade liberalization).[4] But the country experiences also suggest that outward orientation requires a sustained period of heavy investment in the export sector, at rates that are difficult to achieve under conditions of financial crisis.

## Fiscal Aspects of the Debt Crisis

A foreign debt crisis sets in motion various adverse feedbacks that hinder economic recovery and reduce the possibility of a dramatic improvement in a country's export performance. The debt crisis has had three major external components: (1) a rise in world interest rates, which is generally translated into higher domestic interest rates; (2) a fall in export commodity prices; and (3) a reduction or reversal of net capital inflows.

All of these shocks tend to worsen the fiscal balance, which in most debtor countries was already seriously in deficit before the debt crisis hit (indeed, most of the foreign borrowing was used to finance public sector deficits). The combination of rising world interest rates and reduced net capital inflows directly caused a worsening of budget deficits (because of higher interest servicing charges on both home and foreign government debt), combined with a reduced capacity to finance those deficits with foreign borrowing. The result in many cases has been that governments have resorted to inflationary finance (that is, money printing) in lieu of foreign borrowing. This is the experience in Argentina, Bolivia, Brazil, and Mexico.[5] The inflation in turn undermines the tax system, leading to a potentially explosive growth of the budget deficits.

More directly, the collapse of export prices reduces the government's tax revenues from exports and from imports financed by the exports. The reduction in trade tax collections has contributed to the budget crisis in most of the high-inflation economies.

The adverse income effects of all three types of shocks usually have resulted in a real exchange rate depreciation in the debtor economies. While the real depreciation may be salutary for exports in the longer run, it may create several problems in the short run. The government budget deficit tends to widen because the domestic resource costs of the foreign debt are increased by the real depreciation.

At the same time, many private firms (particularly those in the nontraded goods sector and those with heavy foreign debt) may be subject to financial distress, because of the combination of high interest rates and real depreciation. The budgetary burden is then increased to the extent that the government is compelled to bail out foreign firms (for example, to give expensive interest rate subsidies), or more often, to bail out the private banks that are threatened when the private firms go bankrupt.

Once a government's fiscal situation has seriously deteriorated, a fiscal crisis can become self-fulfilling, as argued by Guillermo Calvo (1987). For example, the fear of high future inflation can raise nominal interest rates and thereby raise the interest costs for the government. Higher interest costs in turn widen the fiscal deficit and make high future inflation inevitable. This kind of adverse feedback apparently has contributed to the sustained high interest rates in many of the debtor countries in recent years.

In general, major new export sectors require heavy investment. Sometimes a devaluation can produce a rapid increase in exports (as happened in South Korea and Turkey after 1980, and Brazil after 1983),[6] but only if there is substantial excess capacity resulting from earlier investments (or if there is a sharp domestic recession, which may free up domestic capacity for export if the country produces tradables that are consumed domestically). Also, increasing the capacity of export industries often requires both public and private investment. New export sectors generally require new infrastructure in transport, communications, and perhaps port facilities, that usually are in the domain of public investment. Unfortunately, public sector investment has been among the hardest hit areas of government expenditure in the crisis countries of Argentina, Bolivia, Brazil, Mexico, and the Philippines.

Despite the centrality of the public sector budget in the origin and development of the crisis, there are profound difficulties in measuring and forecasting the fiscal position. Actions with fiscal consequences (for example, actions that increase the public debt or the money supply) are made not only by the central government but also by regional governments, parastatal enterprises, development banks, and the central bank. Often, the finance minister has little ability to measure, much less control, the consolidated public sector accounts. In most of the countries under study, the various governmental entitities outside central government can gain direct access to the central bank or can get government guarantees for foreign borrowing, without the authorization of the finance minister.

Another problem is that private sector obligations often become public sector obligations quickly when a

[4] *S. Edwards, "Structural Adjustment Policies in Highly Indebted Countries," in* Special; *and J. D. Sachs, "The Role of the IMF in the International Debt Crisis," in* Special.

[5] *R. Dornbusch and J. C. de Pablo, "Debt and Macroeconomic Instability in Argentina," NBER Working Paper No. 2378, September 1987, and in* Summary; *E. A. Cardoso and A. Fishlow, "The Macroeconomics of the Brazilian External Debt," in* Summary; *and E. F. Buffie and A. S. Krauss, "Economic Policy and Foreign Debt in Mexico," in* Summary.

[6] *M. Celasun and D. Rodrik, "Debt Adjustment and Growth: Turkey 1970-85, in* Summary.

financial crisis hits. Domestic firms cry for bailouts, and foreign creditors often insist that the central government make good on the private sector debts. The government takeover of the debt can be disguised partially (or at least can be made hard to measure) if it comes in the form of special exchange rates for debt repayments, subsidized credits, or other off-budget means of bailing out private debtors.

The net result of this fiscal complexity is that many companies are forced to rely heavily on inflationary finance even when the measured central government budget seems close to balance. Cardoso and Fishlow discuss such data problems in Brazil, where several years of triple-digit inflation were accompanied by measured deficits near zero. The small measured deficits led some to conclude that the inflation was purely an "inertial" phenomenon. This view was tested in the ill-fated Cruzado Plan, which attempted to use a wage-price-exchange rate freeze to break the inertia. After the collapse of the Cruzado Plan, most observers now concede that large fiscal deficits are the driving force of the high Brazilian inflation.

## Renegotiating the External Debt

In their papers, Lindert and Morton, and Eichengreen demonstrate that previous debt crises usually have ended in some forgiveness (partial cancellation of debt service payments).[7] Typically the debtors service some, but not all, of the debt that is due. A partial writedown of the debt has been the norm, not the exception.

In the past, the compromise typically was reached as the result of bilateral negotiations between debtors and creditors. Lindert and Morton suggest that the involvement of third parties in the 1980s (mainly the creditor governments and the international institutions) has hindered the effective (although often messy) process for arriving at a solution to excessive debt.

Both Eichengreen and Lindert and Morton also find that countries that have achieved partial debt relief have not lost access to the markets to any greater extent than countries that continue to pay their debts. In the aftermath of global debt crises, neither "good" nor "bad" debtors have been able to borrow.

History offers an ironic example of the reason why. Argentina was the only country in South America to service the federal debt in the 1930s, under terms laid down by onerous treaties with Great Britain. The nationalist backlash against foreign influence helped to sweep Peron into power. Peron's populist policies more than undid any beneficial reputational effects that Argentina might have garnered from its debt repayments in the 1930s.

[7] *P. Lindert and P. Morton, "How Sovereign Debt Has Worked," in* Special; *and B. J. Eichengreen, "Till Debt Do Us Part: The U.S. Capital Market and Foreign Lending," NBER Working Paper No. 2394, October 1987, and in* Special.

## Toward a Political Economy of Crisis, Stabilization, and Adjustment

The papers by Haggard and Kaufman, Sachs, and Edwards, as well as the country monographs, all emphasize the political context in which various economic policies are pursued.[8] The basic ideas in most stabilization programs supported by the IMF and the World Bank are quite straightforward: they aim to reduce budget deficits, achieve a real exchange rate depreciation, and open the economy to international trade. The sobering point is that programs of this sort have been implemented repeatedly and have failed repeatedly during the past 30 years in the countries we investigated.

Consider the cases of Mexico and Argentina, for example. As the Mexican case study by Buffie and Krauss makes clear, the "standard" package was attempted in 1971, 1977, and 1983. In the first two cases, at least, major parts of the package were abandoned early on.

Similarly, in Argentina, the "orthodox" package was tried under Peron in 1951; Ongania in 1967 (the so-called Krieger-Vasena program); Viola in 1977-81 (with Martinez de Hoz as finance minister); and to some extent, Alfonsin since 1985. Again, the staying power of the orthodox program has been very weak in Argentina. (Very recently, this weakness was again underscored, by the electoral losses of Alfonsin's Radical Party and the electoral resurgence of the Peronists.) More generally, my review of IMF programs suggests that their most basic weakness is not in design, but rather in implementation.

The NBER studies suggest some answers to why the "standard" programs repeatedly fail. One possibility is the nature of the IMF relationships with the debtor countries. The style of IMF bargaining seems almost designed to undercut the legitimacy of IMF programs, by relying on secret negotiations and short-run actions that involve the executive branch but avoid the legislature.

More significantly, most of the countries under study suffer from deep class and political cleavages, combined with weak political institutions and fragmented political parties that fail to keep pace with rapid increases in political and social mobilization. The result, as pointed out by Huntington (1968, p. 262) is that "cliques, blocs, and mass movements struggle directly with each other, each with its own weapons. Violence is democratized, politics demoralized, society at odds with itself." In the end, governments alternate rapidly between civilian and military regimes, and budgets are exploited for short-term political advantage rather than long-term economic strategy.

Haggard and Kaufman identify several other features of the political landscape that affect a government's capacity to carry out necessary economic adjustments, including: the administrative capacity of

[8] *S. Haggard and R. Kaufman, "The Politics of Stabilization and Structural Adjustment," in* Special.

the governments; the pattern of trade union organization; and the susceptibility of the political institutions to electoral business cycles.

With regard to the substantive design of adjustment programs, Edwards disputes the notion that dramatic liberalization is helpful in the context of a debt or stabilization crisis, suggesting that dramatic liberalization has little basis in either theory or history. He argues that rapid trade liberalization is likely to generate adverse employment effects in the short term, as occurred in the liberalization programs in Argentina, Chile, and Uruguay in the 1970s. Similarly, abrupt devaluations are likely to result in output losses and unemployment in the short run.

### New Approaches to Managing the Debt Crisis

The unsatisfactory economic performance of most of the debtor countries in the past five years has led to continued suggestions for new approaches to international debt management. The studies by Fischer, Krugman, and Sachs consider several alternatives that have been widely discussed, as well as some new proposals.[9]

All of the authors stress that a workable solution to the debt crisis will differ across countries. Some countries, such as Bolivia, Sudan, or Zaire, clearly can service only a small fraction of their debts on market terms. When Bolivia tried to meet its debt servicing obligations during 1982–4, the result was a hyperinflation (the links of debt servicing and hyperinflation are explained by Morales and Sachs). Other countries can service some, but perhaps not all, of their debts at normal market terms. Thus, a real case-by-case approach would recognize the need for substantial debt relief for some of the poorest and weakest economies, and perhaps some lesser degree of relief for the other debtor countries.

Krugman and Sachs both illustrate the efficiency case for debt relief. A heavy debt burden acts like a high marginal tax rate on economic adjustment. If the economy successfully imposes austerity, much of the benefit accrues to the foreign creditors. Partial debt relief can improve the incentives for the debtor country to take needed adjustment actions. In political terms, partial debt relief can strengthen the hand of moderates, who would pay some but not all of the debt, against the hand of extremists, who would like to service little or none of the debt.

Fischer offers an analysis of a broad range of proposals, dividing his analysis between those alternatives that would merely restructure the debt, and those that would effectively cancel part of the debt. He considers debt-equity swaps and concludes that they are unlikely to be a major vehicle for resolving the crisis (indeed, Krugman shows how such swaps can be detrimental to the debtor country).

Among proposals that would offer partial forgiveness to the debtor countries (that is, an explicit writedown of part of the present value of the debt), Fischer focuses on the idea of creating an International Debt Discount Corporation (IDDC). The IDDC would buy developing country debt from the banks at a discount in exchange for claims on the institution, and in turn would collect from the debtor countries. This would cancel some of the debt owed by the debtor countries. Sachs calculates that the IDDC, far from hurting the commercial banks, actually could raise their market value, so deeply are their stock prices currently discounted because of their LDC debt exposure.

However, Fischer stresses that the most likely scenario is that partial relief will result from bilateral negotiations between creditors and debtors (as in the historical examples described by Eichengreen, and by Lindert and Morton) rather than through a single international relief operation.

[9]*S. Fischer, "Resolving the International Debt Crisis," NBER Working Paper No. 2373, September 1987, and in* Special; *and P. R. Krugman, "Private Capital Flows to Problem Debtors," in* Special.

# Research Summaries

## Research Conference Held in October

The following four articles summarize presentations made at NBER's Annual Research Conference in New York on October 19.

*Annual Research Conference—I:*

## The Effect of Social Security Financing on National Saving and on Equity, Within and Across Generations

Michael J. Boskin

Social Security is by far the largest domestic spending program of the federal government, exceeding a quarter of a trillion dollars per year, if one includes Hos-

pital Insurance (HI). Such massive spending can affect overall economic activity.

Partly because of large real increases in Social Security benefits in the late 1960s and early 1970s, and their subesquent indexing, the economic status of the elderly has improved substantially. Their real per capita disposable income exceeds that of the general population and is about two-thirds that of the general population on a per-household basis. Moreover, a variety of features of Social Security benefits and taxes may affect private saving and retirement decisions, and the income and wealth distribution of the United States.

Prior to the 1983 Social Security Amendments, the retirement and disability portions of Social Security faced a large, long-term actuarial deficit: on the order of $1.6 trillion (real, discounted) over the 75-year forecast horizon of the Social Security Administration's actuaries. A variety of features in the 1983 amendments decreased this prospective long-term deficit, although the amendments still did not affect the larger deficit in HI. For the first time since just after Social Security was initiated, legislation now in place projects a very large surplus in the retirement and disability funds. This will cushion the need for rapid large tax increases and/or abrupt slowdowns in benefit growth early in the next century to fund the retirement income of a growing fraction of our population for the indefinite future.

The prospective Social Security surplus is already a subject of debate in short-run budgetary decisions. In fiscal year 1987, Social Security's surplus of about $20 billion decreased the total budget deficit by a corresponding amount. That surplus is scheduled to be $60 or $70 billion a year within five years. The Congressional Budget Office's projections indicate no reduction in the federal deficits excluding Social Security, but a gradual reduction of the total deficit by the amount of the Social Security surplus. We cannot have it both ways. If Social Security is going to build a surplus in order to cushion baby-boomers' retirement, then that surplus cannot be used to fund other programs.

How large is the projected surplus? My own estimates (which differ from those of the Social Security Administration only because I accrue interest to this surplus, whereas they handle each year on a cash basis) show that by the year 2017, the surplus will approach 30 percent of GNP (or two-thirds the current ratio of national debt to GNP).

Well before we accumulate this large a surplus, major political and economic pressures will develop. They will develop in financial markets, because Social Security owns a large fraction of government securities and crowds out other purchasers of such securities. There will be pressure to invest Social Security funds in other types of assets. There also may be political pressure to use the surplus for other purposes, such as to finance HI temporarily (since it is scheduled to start running deficits in the mid-1990s) or to provide tax cuts, benefit increases, or funding for other programs.

I have analyzed the likely impact on system finances for various combinations of such potential outcomes.* In the base case (current law and the intermediate economic and demographic projections, discounted to 1986 and in 1986 dollars) the retirement and disability funds will run a deficit of about one-half trillion dollars over the next 75 years. This is a significantly smaller deficit than what would have occurred without the 1983 amendments, but certainly not the actuarial balance that was projected then. This improvement in the actuarial balance comes from a variety of factors: the speedup of some tax increases; the taxation of one-half of Social Security benefits for well-off retirees above an unindexed exempt amount; the prospective increase in the age of eligibility for full retirement benefits early in the next century; and various changes in coverage.

The Social Security Administration develops three sets of long-range projections encompassing different assumptions about future economic growth and demographic trends. The three scenarios are called pessimistic, intermediate, and optimistic, reflecting their impact on the estimated actuarial balances. Some of the economic and demographic assumptions are controversial, especially the intermediate fertility assumption that projects a sizable rebound of the fertility rate. If the lower fertility assumption turns out to be more accurate and assumptions about economic growth and other factors are correct, then the long-term deficit will $1.3 trillion: an increase of about $0.8 trillion.

What might happen to system finances if the surplus is not allowed to accumulate? If Social Security benefits are increased during the years of surplus, and if these benefit increases remain in place beyond the surplus years, then the long-term actuarial deficit will increase to $3.7 trillion: a $3.2 trillion increase, or more than double the pre-1983 deficit.

Alternatively, benefits could be increased systematically for the period between now and the year 2020 as the surplus accrues, peaking at about 1.3 times current benefits around 2010, but decreasing to about 75–80 percent of currently projected benefits by 2030 and thereafter. If tax rates were just adjusted to a pay-as-you-go basis, they could fall from currently projected levels over the period until 2020 (bottoming out at about three-quarters of current levels by 2010), and then rise to 20–25 percent higher than current levels by 2030 and thereafter.

What would happen to the national saving rate—the sum of personal saving, business saving, the state/local government surplus or deficit, and the federal government surplus or deficit—under alternative scenarios for Social Security financing? In the base case, assuming no induced change in private saving, the Social Security surplus will add about 17 percent to the

**M. J. Boskin and D. J. Puffert, "The Financial Impact of Social Security by Cohort under Alternative Financing Assumptions," NBER Working Paper No. 2225, April 1987; and M. J. Boskin, "Future Social Security Financing Alternatives and National Saving," NBER Working Paper No. 2256, May 1987.*

national saving rate in 1986–2010, but will decrease national saving by 47 percent and 82 percent in 2011–35 and 2036–60, respectively. Over the entire 75-year projection horizon, national saving will be reduced 38 percent.

The impact on national saving clearly varies, depending upon the level and composition of the budget deficit and private saving; Social Security affects national saving indirectly through these channels. But the projected systematic deviation of Social Security's retirement and disability funds from pay-as-you-go finance has direct implications for the national saving rate and, hence, for our current account deficit, interest rates, private investment, and the competitiveness of the U.S. economy.

Under the current formulas, Social Security benefits and taxes are not closely linked. In general, a marginal dollar of tax contribution yields a present discounted value of additional benefits that is close to zero. On a lifetime basis, Social Security is highly redistributive, both across generations and within them. Those most likely to gain substantially are low-income, one-earner couples. Those most likely to pay more taxes than they receive in benefits are higher-income, two-earner couples. Further, one of the reasons that Social Security is so popular is that a large fraction of the population expects to get more back in benefits than it will pay in future taxes. These results suggest that, as a practical matter, Social Security is not really a form of saving for most individuals. The payroll tax truly is a tax at the margin.

*Annual Research Conference—II:*

# Lotteries*

Charles T. Clotfelter

For the first six decades of the 20th century, lotteries were banned in every state. Since New Hampshire broke the ice in 1964, 22 other states and the District of Columbia have entered the lottery business, collectively selling over $1 billion worth of tickets per month.

The lottery boom is of interest to public finance experts because it offers a new and increasingly important source of public revenue; it is of interest to political theorists because the common objective of the state lottery agencies—maximizing net revenue—makes them act very much like private enterprises. Thus, in the quest for increased revenues, states have opted for what some have called a "painless tax," and state government officials are marketing a product that until recently was subject to universal prohibition, and continues to be viewed by many as a form of vice.

## Public Finance Issues

Every state that has adopted a lottery has made it a state monopoly, but most production, distribution, and marketing activities are privatized. State lottery agencies contract with private suppliers for on-line computer systems, media campaigns, and the design, manufacture, and distribution of instant games; they sell tickets through private retail outlets, which work on a commission basis.

About 50 percent of gross revenues go to prizes, 10 percent to all other expenses, and the remainder to the state treasury. Revenue transferred to the state is a tax in effect. As a percentage of expenses, this implicit tax is higher than the tax on a pack of cigarettes or a bottle of liquor.

While a tax of 65 or 70 percent would be politically unacceptable on other commodities, the lottery tax has met with little public complaint. From the players' point of view, a heavily taxed lottery is better than prohibition. But if the objective of the states were to maximize consumer welfare, rather than to maximize revenue, then the tax presumably would be a good deal lower and the prizes correspondingly higher.

Cook and I have analyzed several public surveys and other data sources to determine the incidence of the lottery tax.[1] Perhaps the most remarkable feature of sales (and hence tax incidence) is the high degree of concentration: while about half of a lottery state's adults buy a ticket during the course of a year, and a third play regularly, the 5 percent of adults who play most heavily account for fully half of total sales. These relatively heavy players wager an average of about $1200 per year.

Lottery play is concentrated among certain demographic and socioeconomic groups. Men play a bit more than women do (although the difference is smaller than for other forms of commercial gambling). Middle-aged people play more than the young or old. In the East, blacks play more than whites; in California, Hispanics play more than non-Hispanics. In Maryland, for example, blacks bet an average of $4.50 per week more than whites, after adjusting for differences in income, age, and education. Lottery sales decrease as education increases. And, perhaps surprisingly, there is little consistent relationship between lottery sales and household income. This implies that the implicit lottery tax is highly regressive.

**Both this presentation and the work that it discusses were prepared jointly with Philip J. Cook of Duke University.*

[1] *C. T. Clotfelter and P. J. Cook, "Implicit Taxation in Lottery Finance," NBER Working Paper No. 2246, May 1987, and* National Tax Journal, *forthcoming.*

Do the lotteries enhance social welfare? There is clearly a strong demand for state lottery products. Just as clearly, many players would have to be considered poorly informed about these products. Furthermore, there is the possibility that playing the lottery will enhance the appetite for gambling of some people. Indeed, several lotteries dedicate a portion of the revenue raised to funding clinics for compulsive gamblers. People who impoverish themselves and their families playing the lottery may turn to crime or become the responsibility of the state. On the other hand, lotteries offer competition to the illegal numbers game and hence may have the socially beneficial effect of reducing the power of organized crime.[2]

## Stimulating Sales

Lottery managers are charged with raising as much revenue as possible for the state. Sales per capita have grown extraordinarily fast—14 percent annually in real terms between 1975 and 1985—partially as a result of a series of product innovations and vigorous marketing. Lottery agencies and their suppliers continue to experiment with different prize structures, game formats, and payout rates.

Since the lotteries typically have a 50 percent payout rate, a dollar bet offers a chance at a prize structure with an expected value of only 50 cents (actually less, since prizes are usually subject to income tax). This payout rate is far lower than for other forms of commercial gambling and is attractive to the public only because a small bet buys a chance at a large prize. The mature lotteries offer three types of games, which usually have the same payout rate but very different prize structures. The most popular form of the numbers game pays off at 500-to-1 with probability .001; lotto, on the other hand, features a jackpot that runs into the millions of dollars with a correspondingly small probability of winning. Finally, the instant games offer a range of prizes, with the top prize of $1000 or more at long odds and a set of small prizes that occur more frequently. Designers of the instant games attempt to apply the insights of the cognitive psychology literature on risky choices and also do a certain amount of experimenting with different structures.

Our estimates of demand, using sales data at the state level, have not generated reliable results on the elasticity of demand with respect to payout rate. This is not surprising, since there is little difference across states with respect to payout rate. We have been able to determine that lotto sales are quite responsive to the size of the expected jackpot. It is a reasonable strategy, then, for groups of small states to pool their lotto games in order to increase the size of the jackpots they can offer, as did three New England states recently. Our most remarkable finding on the demand structure is that the markets for the three types of lottery games appear to be largely independent of each other.

The effort to maintain and increase sales is not limited to product redesign and innovation. The lotteries also advertise their products, using carefully crafted Madison Avenue techniques and budgets comparable (as a percentage of sales) to the average U.S. corporation. This type of advertising by a state agency is almost unique to the lotteries. It is certainly not used to promote state universities or state liquor stores. The vast majority of commercial messages from the state to the public promote the lottery.

Relatively few ads mention the odds of winning, and almost none mentions the odds of winning the top prize; however, a majority of lottery ads in a sample that we drew mentioned the *amount* of the top prize. Ads that show people playing usually show them winning. Other common themes include the fun and excitement of playing the lottery, and the pleasures of being wealthy.

Whether lottery advertising is effective in promoting sales is a question we are currently investigating.

[2] *We are currently exploring the effects of lotteries on the illegal numbers game, and on the prevalence of compulsive gambling.*

*Annual Research Conference—III:*

# Further Dollar Depreciation

Rudiger Dornbusch

The likely continuation of a large U.S. external deficit poses a challenge to the stability of exchange rates at current [October 1987] levels. Using the Morgan Guaranty measure of the real exchange rate of the dollar, which includes developed and newly industrialized countries (NICs), the current level of the dollar is above the level of 1980 and somewhat above the average of 1973–80. This is a suitable starting point for evaluating whether the current level of the dollar is appropriate.

What factors explain the massive U.S. trade deficit of 1986–7? There are basically five reasons: (1) the extraordinary overvaluation of 1982–5; (2) the sharp shift in trade with the NICs: the United States has experienced a $60 billion shift in its manufactures trade with these countries since 1980; (3) to the extent that it is a separate factor from point (2), the debt crisis has forced Latin America and other countries into becoming net exporters to the United States; (4) the 13 percent gap in demand growth between the United States and other OECD countries has meant a rapid growth of imports and only moderate export growth; (5) finally, as a result of the preceding factors, the emergence of a current account deficit has brought about a decumulation of external assets and now a growing external debt that

generates a worsening current account deficit by its own debt dynamics.

With these as background, two questions arise: Has the dollar depreciated enough? And, if not, why is the dollar not falling more rapidly?

## Why the Dollar Might Have Depreciated Enough

Most observers who feel that the dollar is now correctly valued place their confidence in one of two arguments. Either they argue that there are long adjustment lags to the depreciation of the past two years and that patience is required to await the full benefits. Or they believe there is basically no need for balance in the U.S. current account because deficits can be financed almost indefinitely.

The adjustment lag argument does not stand up to scrutiny. I have reported elsewhere a simulation of U.S. net exports on the assumption that real exchange rates are maintained at the level of the early 1980s and that growth in the United States and abroad proceeds at the same pace. My conclusion is that the deficit will decline over the period to 1989, but that in the end a trade deficit of $100 billion (and growing) remains. Only if the rest of the world experiences a major spurt in demand could the gap be closed. Of course the prospect of such a spurt is quite unlikely.

The alternative is to say that the United States does not really need to adjust because deficits can be financed for a very long period. This argument is most frequently supported by reference to an almost unlimited ability of the United States to finance current account imbalances by selling off assets. As yet, the rest of the world holds a small share of its portfolio in the form of U.S. assets and that accordingly there are years worth of saving from all industrialized countries available to finance a continuation of the deficit even at $100 billion levels. Just as a country with terms-of-trade improvement can spend the extra real income without impairing its creditworthiness, so can the United States spend the rents that flow from the attractiveness of its assets.

The fact that in 1987 central banks rather than private savers have been financing the U.S. current account calls into question this argument. The international capital flow argument is more likely an argument about two-way diversification than one about international one-way lending. There is certainly no life-cycle story of why the United States should be running down assets.

McKinnon (1987a,b) has made an entirely different case for the undervaluation of the dollar and the overvaluation of the yen. He argues that at existing exchange rates, prices are much higher in Japan than in the United States, and therefore that the dollar is undervalued relative to the yen.

It is difficult to understand what to make of the McKinnon discussion. Perhaps he believes that fiscal policy alone governs current account imbalances and that relative prices do not, or should not, play a role. But the entire history of purchasing power parity (PPP), starting with Cassel, emphasizes that when real variables change, so do equilibrium real exchange rates. This is most obviously true when productivity growth rates in the traded goods sectors among countries differ from the overall rates of inflation in those countries.[1] But it is, of course, also true for fiscal changes as we know from the literature on transfer problems. McKinnon's contention therefore must be viewed as curious until further clarification is offered.

## How Much Further Dollar Decline?

Most econometric estimates of U.S. trade equations suggest that considerable further depreciation is required to cut the external balance to near zero. Just how much depends on assumptions about a sustainable level of the deficit and what is assumed about relative growth rates of spending here and abroad.

Assuming the mid-1987 level of U.S. competitiveness and equal growth rates of spending here and abroad, the external balance will show significant improvement in the future. As a result of lagged responses to the depreciation that had occurred by mid-October 1987, our current account balance will fall to $100 billion by the end of 1988. But then deterioration sets in again as a consequence of the trend factors discussed later in this article and because of accumulating interest burdens.

A sharp acceleration of foreign relative spending would eliminate our deficit. But the required increase in growth of spending abroad—an extra 2.5 percent in each of the next three years—is very large if judged by foreign intentions. Failing such a foreign growth spurt, the dollar will need to fall much further, perhaps as much as 30 percent from its level in mid-October.[2]

## Why Is the Dollar Not Depreciating More Rapidly?

If this analysis is correct, why has the dollar not yet declined further? There are certainly no compensating interest differentials that would support rationally holding U.S. assets. This is a hard question that a more prudent writer might avoid. The probable answer lies not in irrationality but rather in the short horizon of speculation.

Asset markets are dominated by speculators who are limited in their ability to provide long-term stabiliz-

[1] *See Marston (1986).*

[2] *See Dornbusch (1987), Krugman and Baldwin (1987), and Hooper and Mann (1987) for discussions of the need for further dollar decline.*

ing speculation.[3] Regulatory reporting requirements and, above all, quarterly performance competition prevent financial institutions and corporations from engaging in long-term speculation if the short-term uncertainty is too high. Thus, even though there may be a consensus that over a two-year period the dollar will undergo a 30 percent depreciation, few institutions take a long-term position and wait for that depreciation. The reason is that a short-run adverse trend is seen as much more costly than the ultimate, almost certain profit. Of course, there is some long-term speculation. But there is also some central bank intervention, in fact an extraordinary amount. But more important than the magnitude of intervention is the willingness of central banks to stop one-way speculation by creating sufficient uncertainty about the near-term pace of depreciation. That means that depreciation occurs in chunks, with irregular intervals of stability or even partial reversal in between.

Looking back, we observe that a massive dollar depreciation has taken place without any significant influence on U.S. interest rates or on inflationary expectations. Looking forward, it seems hard to believe that another 30 percent is possible without speculators catching on. But small action on interest rates is enough to check speculation. Moreover, the further the depreciation is carried, the more diffuse are expectations about the magnitude and timing of any remaining depreciation and hence the easier the task of destabilizing the speculators.

There is a further argument used to justify central bank intervention: continuing dollar depreciation in the near term would imply that the J-curve is persistently at work. Further depreciation, by raising the prices of imports and reducing the prices of exports, keeps dominating the quantity adjustments; hence, current account improvement simply does not come into sight. The failure of current account improvement to emerge in time tests the patience of speculators who take an excessively pessimistic view of the currency and might stage a run that costs control. Hence the need to space out depreciation to allow volume adjustments to become significant and thus elicit stabilizing speculation.

This interpretation of foreign exchange markets in the past half year assumes that central banks agree on the need for much further dollar depreciation but choose to bring it about in a controlled fashion. If so, there presumably must also be an idea of how Europe and Japan absorb the gain in U.S. competitiveness.

The alternative explanation is that the United States accepts that the dollar has gone far enough, on whatever basis, and is simply helping to demonstrate to the market the new equilibrium rate, if necessary with increased interest rates. Of course, it might also be a much more shortsighted policy pursued for the convenience of an election year and motivated by concern about increasing U.S. inflation in the next 12 months. Whichever the motivation, defending an overvalued exchange rate is a dead-end street. The risks of disruptive high interest rates and ultimate collapse are extremely high.

[3] *This discussion follows Dornbusch and Frankel (1987).*

## The Need for Trend Dollar Depreciation

It is worth emphasizing one factor that suggests a need for trend depreciation of the dollar arising from the special role played in the U.S. market by the NICs. This argument was made in Dornbusch (1979) and has, since then, become dramatically more apparent. The emergence of NICs as suppliers of manufactures in world trade occurs largely in the U.S. market: the U.S. market is large and relatively open, thus inviting any infant industry to try itself. By contrast, Europe and Japan are heavily protected. This suggests that over the next decade the United States will absorb an unusually large share of the exports of the NICs.

In the 1960s and 1970s, U.S. exports of capital goods and technology equipped these countries as exporters of manufactured goods. Today they import technology and capital from Japan and import increasingly to the U.S. market. These facts are both apparent from Table 1, which shows the shift in our manufactures trade balance with the NICs.

**Table 1: U.S. Manufactures Trade with Developing Countries (Billion $)**

| | *Imports* | *Exports* | *Balance* |
|---|---|---|---|
| 1980 | 29.5 | 55.6 | 26.1 |
| 1981 | 35.1 | 61.5 | 26.4 |
| 1985 | 65.5 | 46.0 | -19.5 |
| 1986 | 77.3 | 49.4 | -27.9 |

*Source: GATT and U.S. Department of Commerce.*

U.S. political interests make it very difficult to close that gap by protection. Thus, unless the NICs can be pushed into real appreciation and inward-looking growth, there is a need for U.S. depreciation relative to Europe and Japan to provide the room for increased net exports from the developing world.

The increasing share of the NICs in our imports of manufactures is another indicator of their growing importance. Some of this trade, of course, reflects new trade in intermediate products and may well enhance U.S. competitiveness. This is the case, for example, when car engines are imported from Mexico or Brazil. But the shift in the manufactures trade balance points to the fact that trade is seriously unbalanced. The common view that developing countries will spend what they earn misses an important point: in part they are high savers (as for example in Korea); in part they do

spend, but they spend on imports from Japan or Europe.

Thus, as a long-term issue, there is a triangle problem. The United States will be importing increasingly from the NICs, and thus there is a need to create room by gaining competitiveness and increasing net imports to Europe and Japan. Therefore, the dollar will continue to depreciate relative to the currencies of Europe and Japan.

## References


Dornbusch, R. (1979). "Issues in International Finance: Who or What Controls the Dollar?" Data Resources *World Economic Bulletin* (Spring).

———— (1987a). "External Balance Correction: Depreciation or Protection?" *Brookings Papers on Economic Activity* 1.

———— (1987b). "Some Doubts about the McKinnon Standard." *Economic Perspectives*, forthcoming.

———— and J. A. Frankel (1987). "The Flexible Exchange Rate System: Experience and Alternatives." Presented at the October 1987 Basel Conference of the International Economics Association.

Hooper, P. and C. Mann (1987). "The U.S. External Deficit: Its Causes and Persistence." Paper presented at the October 1987 Conference of the Federal Reserve Bank of St. Louis, on "The U.S. Trade Deficit: Causes, Consequences, and Cures."

Krugman, P. R. and R. E. Baldwin (1987). "The Persistence of the U.S. Trade Deficit." *Brookings Papers on Economic Activity* 1.

Marston, R. E. (1986). "Real Exchange Rates and Productivity Growth in the United States and in Japan." NBER Working Paper No. 1922 (May).

McKinnon, R. (1987a). "Currency Protectionism: Parity Lost." *Wall Street Journal* (February 2).

———— (1987b). "A Gold Standard without Gold. Putting a Stop to Rapid Currency Swings." *New York Times* (April 12).

———— (1987c). "A Model for Currency Cooperation." *Wall Street Journal* (September 21).


*Annual Research Conference—IV:*

# Velocity: Implications for Monetary Policy


William Poole


The sharp decline of velocity in the United States after 1980, which surprised many economists (including this one), has upset much analysis of monetary policy. Many explanations of the velocity decline have been offered, but the most promising is that the elasticity of the demand for money with respect to interest is substantially higher than was previously thought. U.S. data from 1915 through 1986 suggest that the true money demand equation has an income elasticity of one, an interest elasticity of about -0.6, and no time trend. Rising interest rates, not time, then explain the rise in velocity from 1946 to 1980.

However, the existence of a reliable trend in velocity (of about 3 percent per year for M1) was so widely accepted by the late 1970s that the problem of distinguishing between trend and rising interest rates as explanations for the postwar rise in velocity deserves further comment.

In the mid-1970s, most economists had settled on a specification of money demand that attributed the postwar rise of velocity to a combination of a relatively low income elasticity, of 0.6 to 0.8, and a relatively low interest elasticity of -0.1 to -0.2. However, these elasticities were not pinned down very well econometrically because of the high collinearity of income and interest rates over the postwar years. This money demand function did not hold up very well in the late 1970s, and many economists fell back on a stable velocity time trend and neglected the economic determinants of velocity. The time trend was considered an empirical regularity, perhaps explained by some combination of technical change in cash management practices and an income elasticity of money demand below unity.

After 1981 the reliable increase in velocity became instead a decline in velocity, which no one seemed to be able to trust or explain. This led to the prevailing view that money demand is too unreliable to be a useful guide for monetary policy.

My rethinking of these issues has resulted in several conclusions. First, it was and is a mistake to believe that a time trend could provide useful insights into the behavior of money demand. Time has a seductive appeal because velocity is relatively smooth over time. Breaks in the time trends match changes in the direction of velocity, but these breaks cannot be explained and therefore have no predictive or explanatory value.

Second, concentrating on postwar data creates a severe multicollinearity problem. This problem is substantially reduced by using annual data back to 1915, but with time-series data there is still no way to distinguish an income elasticity different from one from a trend in the residuals of the money demand equation. Income almost always rises, and sustained fluctuations in the growth rate of income are too small to permit reliable estimation of the income elasticity. However, by constraining the income elasticity to unity, it may be possible to estimate the interest elasticity.

Third, there is a long-unresolved issue of whether a long or short interest rate belongs in the money demand equation. On a priori grounds, most economists have come down on the side of a short rate. However, as already noted, velocity is a very smooth series while a short rate, such as the commercial paper rate, is a

rather volatile series. A long-term rate—I use the AAA bond yield—is a relatively smooth series and in fact fits the velocity series better than a short rate does over long sample periods. The better performance of the long rate can be rationalized by assuming that money demand adjustments occur in response to "permanent" changes in short-term interest rates, and that these are measured more accurately by long than by short rates.

From this work, it appears that the interest elasticity is in the neighborhood of -0.6. If this result stands up to further investigation, an important implication is that there is much more scope than monetarists have thought for nonmonetary disturbances that affect interest rates to affect GNP. For example, a disturbance that raises the long rate from 8 percent to 9 percent would, for a given money stock, raise GNP by 0.7 percent.

Moreover, a predetermined monetary plan to reduce inflation now appears unworkable. In the late 1970s, many economists favored steady and predictable annual reductions of money growth until the growth rate was down to, say, 3 percent. But with lower interest rates brought on by lower inflation, this plan would, with a relatively high interest elasticity of money demand, cause so large a decline in nominal GNP that a severe depression would be likely.

The alternative to a monetary policy that focuses on controlling money growth is one that focuses on controlling interest rates. A substantial body of recent research has shown that interest rates are quite responsive to investors' expectations concerning future monetary policy. This work arose from the obvious response in the credit markets to weekly releases of money stock data over 1979–82. It is clear that the effects of release of money stock data depend on investor expectations concerning monetary policy. As the Federal Reserve paid less attention to controlling money growth after 1982, the interest rate response to money data declined. However, as the market became convinced that the Fed was basing monetary policy decisions on the performance of the real economy, interest rates began to respond to releases of the industrial production index and other real economic indicators.

A conclusion from this research is that short-run interest rate fluctuations reflect to a substantial degree market speculation on future monetary policy. For this reason, rates cannot be used, as some have argued, to provide reliable information on conditions such as the strength of aggregate demand and inflationary expectations; rates reflect bets on Federal Reserve policy as well as economic fundamentals beyond direct policy control.

Today the policy issue is whether the velocity adjustment is complete. At some point, money growth must fall from the rapid rates of 1985–6 if progress in reducing inflation is to be maintained. Unfortunately, knowledge of money demand is currently too limited to be able to identify in advance and with confidence the completion of the velocity adjustment to the large decline in interest rates after 1981. But there is a strong case that the old monetary regularities have not fallen apart. Interest rate control is not a reliable policy and the extremely sharp deceleration of money growth in 1987 could have the same implications that similar decelerations have had in the past.

# Economic Outlook Survey

## Fourth Quarter 1987

Victor Zarnowitz

According to the December survey of 20 professional forecasters taken by NBER and the American Statistical Association, slow economic growth of less than 2 percent per year is expected in the first half of 1988 and some improvement is predicted for the second half. Only a few predict absolute declines in total output (GNP in constant dollars) that would be so persistent and pronounced as to represent another business cycle recession. The unemployment rate is expected to edge slightly higher, industrial production to show somewhat better gains than real GNP, and corporate profits after taxes to be weak. The inflation rates predicted for 1988—about 3.4 percent for the implicit GNP price index, 4.2 percent for the consumer price index (CPI)—are 0.5 percent higher than those estimated for 1987.

### The Downward Shift in Forecasts of the Rate of Change in Output

The median forecasts of real GNP growth are 2.3 percent, 2.1 percent, 0.8 percent, 3.4 percent, and 2.4 percent for the five successive quarters 1987:4–1988:4, all at annual rates (a.r.). They suggest substantial downward revisions in forecasts when compared with the following figures for 1987:4–1988:3 from the previous (September 1987) survey: 2.9 percent, 3.5 percent, 1.9 percent, and 2.9 percent. It is now clear that many economists reduced their expectations considerably after the shock of the stock market crash of October 1987. However, it is mainly the forecasts of the near future that have been affected, not the estimates for 1987 or

## Projections of GNP and Other Economic Indicators, 1987-8

| | Annual | | | Percent Change | |
|---|---|---|---|---|---|
| | 1986 Actual | 1987 Forecast | 1988 Forecast | 1986 to 1987 | 1987 to 1988 |
| 1. Gross National Product ($ billions) | 4235.0 | 4477.5 | 4737.0 | 5.7 | 5.8 |
| 2. GNP Implicit Price Deflator (1982 = 100) | 114.1 | 117.4 | 121.4 | 2.9 | 3.4 |
| 3. GNP in Constant Dollars (billions of 1982 dollars) | 3713.3 | 3813.0 | 3897.0 | 2.7 | 2.2 |
| 4. Unemployment Rate (percent) | 7.0 | 6.2 | 6.1 | -0.8[1] | -0.1[1] |
| 5. Corporate Profits After Taxes ($ billions) | 126.8 | 135.0 | 138.2 | 6.5 | 2.4 |
| 6. Nonresidential Fixed Investment (billions of 1982 dollars) | 443.8 | 448.5 | 472.0 | -1.1 | 5.2 |
| 7. New Private Housing Units Started (annual rate, millions) | 1.81 | 1.65 | 1.56 | -8.44[2] | -5.35[2] |
| 8. Change in Business Inventories (billions of 1982 dollars) | 13.8 | 31.2 | 14.3 | 17.4[3] | -16.9[3] |
| 9. Treasury Bill Rate (3-month, percent) | 5.97 | 5.78 | 5.90 | -0.19[1] | 0.12[1] |
| 10. Consumer Price Index (annual rate) | 1.9 | 3.7 | 4.2 | 1.8[1] | 0.5[1] |

| | Quarterly | | | | | | Percent Change | |
|---|---|---|---|---|---|---|---|---|
| | 1987 Q3 Actual | 1987 Q4 Forecast | 1988 Q1 Forecast | 1988 Q2 Forecast | 1988 Q3 Forecast | 1988 Q4 Forecast | Q3 87 to Q3 88 | Q4 87 to Q4 88 |
| 1. Gross National Product ($ billions) | 4512.0 | 4575.0 | 4634.4 | 4696.5 | 4770.5 | 4842.5 | 5.7 | 5.8 |
| 2. GNP Implicit Price Deflator (1982 = 100) | 117.8 | 118.8 | 119.8 | 120.8 | 121.9 | 123.1 | 3.5 | 3.6 |
| 3. GNP in Constant Dollars (billions of 1982 dollars) | 3831.2 | 3852.9 | 3873.0 | 3881.0 | 3914.0 | 3937.0 | 2.2 | 2.2 |
| 4. Unemployment Rate (percent) | 6.0 | 6.0 | 6.1 | 6.2 | 6.2 | 6.2 | 0.2[1] | 0.2[1] |
| 5. Corporate Profits After Taxes ($ billions) | 137.0 | 138.0 | 138.0 | 138.5 | 140.0 | 139.5 | 2.2 | 1.1 |
| 6. Nonresidential Fixed Investment (billions of 1982 dollars) | 461.8 | 467.3 | 468.0 | 472.0 | 474.5 | 480.5 | 2.8 | 2.8 |
| 7. New Private Housing Units Started (annual rate, millions) | 1.62 | 1.60 | 1.55 | 1.55 | 1.55 | 1.55 | -4.44[2] | -3.13[2] |
| 8. Change in Business Inventories (billions of 1982 dollars) | 18.2 | 20.0 | 15.0 | 15.0 | 15.0 | 11.8 | -3.2[3] | -8.2[3] |
| 9. Treasury Bill Rate (3-month, percent) | 6.03 | 5.90 | 5.74 | 5.76 | 5.95 | 5.90 | -0.08[1] | 0.00[1] |
| 10. Consumer Price Index (annual rate) | 4.5 | 4.2 | 4.5 | 4.2 | 4.3 | 4.5 | -0.2[1] | 0.3[1] |

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, December 1987. The figures on each line are medians of twenty 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.

the longer-term outlook. The median predictions for 1986-7 and 1987-8 are now 2.7 percent and 2.2 percent. In September they were 2.6 percent and 2.8 percent, respectively.

The percentage distributions of point forecasts of real growth indicate a high dispersion and a large downward shift in individual expectations.

*Predicted Percentage Change in Real GNP, 1987-8*

| | *September 1987 Survey* | *December 1987 Survey* |
|---|---|---|
| 3.0 to 3.9 percent | 42 | 10 |
| 2.5 to 2.9 percent | 42 | 26 |
| 2.0 to 2.4 percent | 5 | 32 |
| Less than 2.0 percent | 11 | 32 |

The figures suggest increased uncertainty and pessimism among the forecasters. Also, most of the new distributions show some skewness of negative sign (that is, toward the low values) so that their means are a little smaller than their medians.

## Moderate Price Rises Expected

The median forecasts of the rate of change in the GNP implicit price deflator (IPD) are 2.9 percent for 1986-7, 3.4 percent for 1987-8, and 3.3-3.9 percent for the five quarters through 1988:4. The comparable figures in the September survey were all higher: 3.2 percent, 4.1 percent, and 3.8-4.2 percent.

For the CPI, the group now predicts a rise of 4.2 per-

cent in 1988, whereas in September the forecast was 4.5 percent. Only three respondents expect less CPI inflation in 1988 than in 1987.

## Probabilistic Forecasts of Growth and Inflation

By asking the forecasters what probabilities they attach to different outcomes for growth and inflation, one can elicit information that point forecasts do not reveal and can assess the uncertainties involved with more directness and confidence. The average of the individual replies on output growth are:

*Chances in 100 of Real GNP Growing in 1987-8*

| *Growth by* | *September 1987 Survey* | *December 1987 Survey* |
|---|---|---|
| 4.0 percent or more | 10 | 4 |
| 2.0 to 3.9 percent | 62 | 46 |
| 0 to 1.9 percent | 22 | 39 |
| Negative | 5 | 11 |

These measures show that a large shift has occurred in the structure of expectations; the forecasters see less chance of high or moderate growth and more chance of low or negative growth this year.

The probabilistic forecasts of price levels also show a distinct change. The odds have shifted against high inflation in favor of low inflation:

*Chances in 100 of IPD Increasing in 1987-8*

| *Increase by* | *September 1987 Survey* | *December 1987 Survey* |
|---|---|---|
| 6.0 percent or more | 12 | 3 |
| 4.0 to 5.9 percent | 55 | 32 |
| 2.0 to 3.9 percent | 31 | 56 |
| Less than 2.0 percent | 2 | 9 |

## Chances of Recession and Predictions of Unemployment

The individual assessments that real GNP will decline average 13, 29, 29, 21, and 26 chances in 100 for the five successive quarters 1987:4-1988:4. These figures tend to be higher than their counterparts in the survey taken three months earlier but not by large margins.

Unemployment as a percentage of the civilian labor force is forecast to average 6.2 percent in 1988:4, with a standard deviation of 0.4 and a range of 5.4-7.0 percent. Nearly 60 percent of the sample expect the unemployment rate to rise; the rest is evenly divided between declines and no change.

## Divided Views of Short-Term Interest Rates; Long Rates More Likely to Rise

The forecasters are nearly evenly divided on whether the three-month Treasury bill rate will be lower in 1988:4 than it was in 1987:4. The group medians for the two quarters are both 5.9 percent; the group mean is somewhat higher in 1988:4 at 6.2 percent. The range for 1988:4 is as large as 5.2-8.5 percent, however.

For long-term rates, represented by the yield on new high-grade corporate bonds, more respondents predict rises in the year ahead, but few foresee large changes. The median figures are 10.2 percent and 10.5 percent for 1987:4 and 1988:4, respectively. The range at the end of the year is 8.9-13 percent.

Previously, there was more consensus that the rates would move up, but the expected rises were no less gradual.

## Slow Growth in Consumption

Real consumption expenditures are predicted to rise at annual rates of 1.7-2.0 percent in the four quarters of 1988 and to gain only 1.7 percent in 1987-8. The estimate for 1986-7 is 2 percent (a slight decline in 1987:4 is expected). These averages hide much dispersion among the individual forecasters, which is rather unusual for this smooth series. Thus, the mean of the predictions for 1987:4-1988:4 is 1.7 percent with a standard deviation of 1.6 percent and a range of -2 to +6 percent.

## Some Further Decline in Housing

Residential investment in constant dollars, after flattening off in 1987, is expected to decrease 3 percent in 1988. Housing starts are predicted to fall by about 8 percent in 1986-7 and 5 percent in 1987-8. Since the declines in starts this year are expected to be concentrated in the first quarter, the end of the weakness in housing may be near.

## Relative Strength in Plant and Equipment, Weakness in Inventory Investment

Nonresidential investment in constant dollars is forecast to weaken in 1988:1 but then to pick up and finish the year on a note of strength. The median growth rates (a.r.) here are 0.6 percent, 3.4 percent, 2.1 percent, and 5.1 percent for the four quarters of 1988. The gain in 1986-7 is estimated at 1.1 percent; the gain in 1987-8 is forecast at 5.2 percent. Less than 30 percent of the sample predict that business fixed investment will decline in the course of the current year.

Change in business inventories is expected to decrease in 1988 about as much as it increased in 1987. The median forecast for this year is -17 billions of 1982 dollars. About two-thirds of the sample predict that inventories will rise more slowly (but not decline).

## Reduced Prospects for Profits

Corporate profits after taxes are predicted to be stagnant early and falling late this year. They will rise 6.5

percent in 1987 and 2.4 percent in 1988. These median forecasts are considerably lower than those from the previous NBER-ASA survey (7.3 percent and 8.5 percent). However, only about 30 percent of the group expect actual declines in profits during 1988.

### Strong Exports Maintain Growth in Industrial Production

Large reductions in the trade deficit measured in real terms are expected, averaging about 19 percent between 1987:4 and 1988:4. That is, exports should be rising significantly faster than imports when adjusted for projected inflation at home and abroad, reducing the negative gap between the two from almost 130 to about 100 billions of 1982 dollars.

According to the forecasters, the strong exports will help maintain growth in industrial production, and output of manufacturing, mining, and utilities will gain 3.6 percent in 1986-7 and 3.4 percent in 1987-8.

### Government Purchases, Policy, and Other Assumptions

Federal government purchases of goods and services are predicted to be up just 0.8 percent in 1986-7 and 1.5 percent for 1987-8. The corresponding median forecasts for state and local governments are 3.3 percent and 2.3 percent.

Five forecasters assume defense outlays will not change or will change as much as real GNP, while eleven assume reductions varying from 1-4 percent. Five forecasters expect tax policy to be unchanged while ten assume it will be altered in the direction of raising revenues by amounts varying from $6 to $20 billion or more.

Several individuals estimate monetary growth ranging from 5-8 percent for M1 and eight expect a growth range of 5-9 percent for M2. Six respondents assume that monetary policy will be "easy" or "much easier."

Most forecasters see the dollar as continuing to fall but the numbers they quote vary widely (from 2 percent to 10 percent or more). They predict that import prices will rise, real exports will expand, and the trade deficit will contract.

The demand for energy is described as "soft" by four forecasters, "stable" by two, or up 1.5-2 percent by two. Four forecasters assume oil prices will be $17-18 per barrel. Three expect them to be lower, two "flat," and three higher. These assumptions are generally more optimistic (from the viewpoint of oil consumers) than those that prevailed in September.

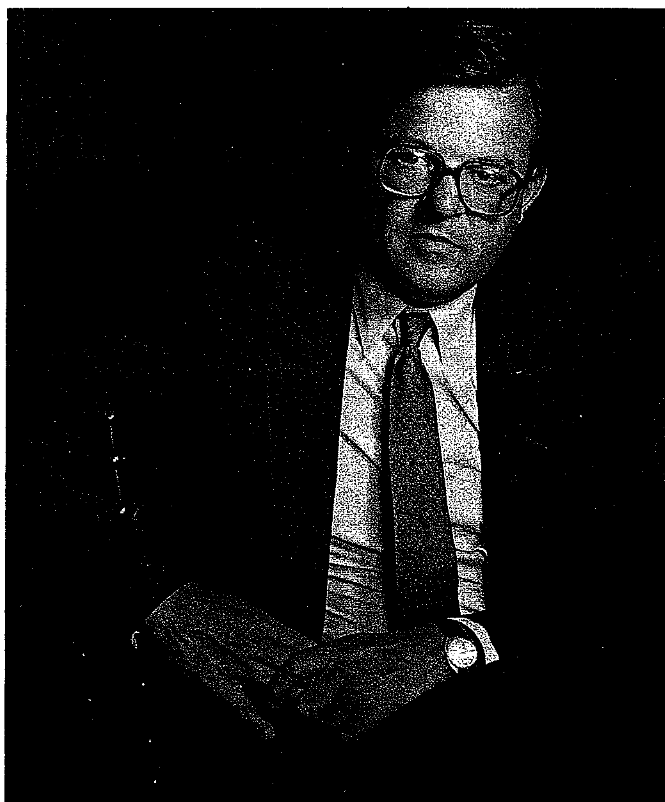
*This report summarizes a quarterly survey of predictions by 20 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School 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

## Rudiger W. Dornbusch

Professor Dornbusch, a research associate in NBER's Programs in International Studies and Economic Fluctuations, is the Ford International Professor of Economics at MIT, where he has been a member of the faculty since 1975.

Dornbusch was born in Krefeld, Germany, in 1942. He received the Licence es Sciences Politiques from the University of Geneva in 1966 and the Ph.D. in Economics from the University of Chicago in 1971. Prior to joining the MIT faculty, he taught at the University of Chicago and the University of Rochester.



A frequent economics advisor and consultant, Dornbusch has been a member of the Committee on Growth and Stability of the Social Science Research Council since 1979. He also has served on the Economics Panel of the National Science Foundation, the Brookings Panel on Economic Activity, and is a member of the advisory committee for the Institute for International Economics.

Dornbusch is a fellow of the American Academy of Arts and Sciences and of the Econometric Society. In

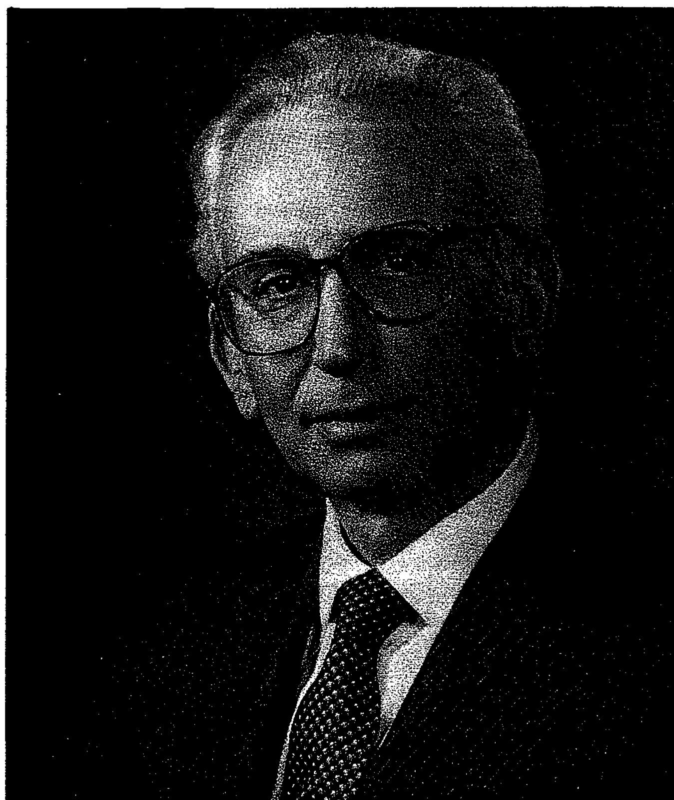
1979 he received the John Simon Guggenheim Fellowship. Author and editor of numerous books and publications, Dornbusch is associate editor of the *Quarterly Journal of Economics*.

He and his wife, Eliana A. Cardoso, who is also an economist, live in Cambridge, MA. Dornbusch enjoys and collects modern art.

## George N. Hatsopoulos

Dr. Hatsopoulos is the founder, chairman of the board, and president of Thermo Electron (Waltham, MA), a company that develops, manufactures, and markets environmental and analytical instruments, cogeneration systems, industrial process equipment, and biomedical materials and products. He has been a member of NBER's Board of Directors since 1985.

Hatsopoulos was born in Athens (Greece) in 1927, and came to the United States at the age of 20. He received his B.S. in 1949, M.S. in 1950, M.E. in 1954, and Sc.D. in 1956 from MIT. His fields were mechanical engineering and thermodynamics. He had also studied at the National Technical University of Athens.



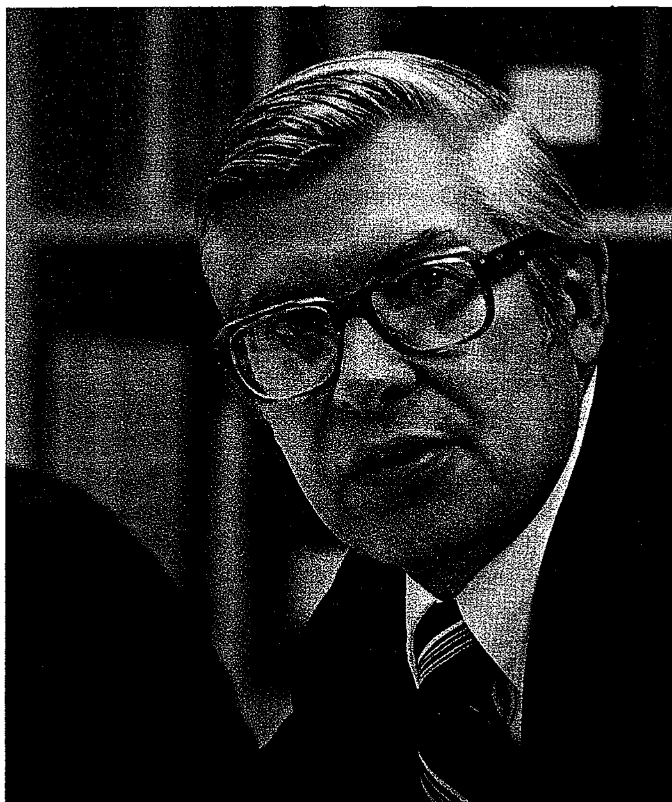
From 1956, the year he founded Thermo Electron, until 1962 he served on the MIT faculty. He is currently a senior lecturer at MIT.

Hatsopoulos is chairman of the Board of Directors of the Federal Reserve Bank of Boston, a director of the American Business Conference, and vice chairman of the National Association of Manufacturers.

He lives in Lincoln, MA with his wife, Daphne. They have two children, Nicholas and Marina.

## Robert C. Holland

Dr. Holland, a member of NBER's Board of Directors since 1980, is president of the Committee for Economic Development (CED), a nonprofit research and educational organization of business and academic leaders devoted to the study of public policy problems.



A longtime resident of Washington, DC, Holland was born in Tekamah, Nebraska in 1925. He received a B.S. degree in Finance in 1948, an M.A. degree in 1949, and a Ph.D. in Economics in 1959, all from the University of Pennsylvania.

Before joining the CED in 1976, Holland worked for more than 25 years in the Federal Reserve System. He served as a member of the Board of Governors from 1973 until 1976. From 1961 to 1973, Dr. Holland held various research and administrative staff positions there, culminating in service as executive director (1971–3), secretary of the Board (1968–71), and secretary of the Federal Open Market Committee (1966–73).

He was employed at the Federal Reserve Bank of Chicago from 1949 to 1961 in various positions ranging from financial economist to vice president and chief lending officer. During 1948–9, he served as an instructor in Money and Banking at the Wharton School of the University of Pennsylvania.

He is a member of the National Academy of Public Administration; United Nations Association's Business and Labor Economic Policy Council; Council on Foreign Relations; and Congressional Economic Leadership Institute.

Dr. Holland is married to the former DeEtte Hedlund and has three children: Joan, Nancy, and Timothy.

## William Poole

William Poole is professor of Economics at Brown University and a research associate in NBER's Program in Financial Markets and Monetary Economics.

Poole received his A.B. from Swarthmore College in 1959, and his M.B.A. in 1963 and Ph.D. in 1966 from the University of Chicago. He was a member of the President's Council of Economic Advisers from 1982 to January 1985. He also served on the Research Advisory Board of the Committee for Economic Development and spent a sabbatical year at the Research Department of the Reserve Bank of Australia.

Before joining the Brown faculty in 1974, Dr. Poole served as an advisor to the Federal Reserve Bank of Boston and as an economist at the Board of Governors of the Federal Reserve System. He was on the faculty of the Johns Hopkins University and has taught at MIT, Harvard, Georgetown, George Washington, and American Universities.

Poole is the author of *Money and the Economy: A Monetarist View* and numerous scholarly papers. He is an associate editor of the *Journal of Money, Credit and Banking* and an adjunct scholar at both the American Enterprise Institute and the Cato Institute.

Poole lives in Providence, RI with his wife, Mary Lynne, and their three sons: William, Allen, and Jonathan. One of his hobbies is sailing.

# Conferences

## Immigration, Trade, and Labor

NBER held a conference on "Immigration, Trade, and Labor," organized by Richard B. Freeman of NBER and Harvard University, at its Cambridge office on September 11–12. The agenda was:

THE SUPPLY OF IMMIGRANTS

George J. Borjas, NBER and University of California at Santa Barbara, "Immigration and Self-Selection"

Richard B. Freeman; George J. Borjas; and Kevin Lang, NBER and Boston University, "Undocumented Mexican-Born Workers in the United States: How Many, How Permanent?"

Ann P. Bartel, NBER and Columbia University, and Marianne J. Koch, Columbia University, "Internal Migration of U.S. Immigrants"

Discussants: Charles C. Brown, NBER and University of Michigan, and Jeffrey Passel, U.S. Bureau of the Census

HOW IMMIGRANTS FARE

Bruce J. Chapman and John J. Beggs, Australian National University, "Immigrant Wage and Unemployment Experience in Australia"

Marta Tienda, University of Chicago, and Franklin Wilson, University of Wisconsin, "Ethnicity, Migration, and Labor Force Activity"

David E. Bloom, NBER and Columbia University, and Morley K. Gunderson, University of Toronto, "An Analysis of the Earnings of Canadian Immigrants"

Discussants: Geoffrey Carliner, NBER, and Glenn Withers, La Trobe University, Australia

EFFECTS OF FACTOR MIGRATION

Peter J. Kuhn and Ian Wooten, University of Western Ontario, "Immigration, International Trade, and the Wages of Native Workers"

Robert J. LaLonde and Robert H. Topel, NBER and University of Chicago, "Labor Market Adjustments to Increased Immigration"

Barry Hughes, Economic Consultant to the Treasurer, Australia, "Immigration and the Australian Adult Beveridge Curves: Some Exploration of an Apparent Paradox"

Discussants: John M. Abowd, NBER and Cornell University, and Daniel S. Hamermesh, NBER and Michigan State University

THE EFFECTS OF TRADE ON MARKETS

Richard B. Freeman and Lawrence F. Katz, NBER and Harvard University, "Industrial Wage and Employment Determination in an Open Economy"

John M. Abowd; and Thomas Lemieux, Princeton University, "International Competition and Union Wage Settlements"

Robert G. Gregory, Australian National University, "Why Are Low-Skilled Immigrants in the United States Poorly Paid Relative to Their Australian Counterparts? Some of the Issues Illustrated in the Context of the Australian Footwear, Clothing, and Textile Industries" (Joint with R. Anstie and E. Klug)

Discussants: Robert Lawrence, The Brookings Institution, and James L. Medoff, NBER and Harvard University

IMPACTS OF IMMIGRATION ON NATIVES

Joseph G. Altonji, NBER and Northwestern University, and David Card, NBER and Princeton University, "The Effect of Immigrants on Employment Outcomes of Natives"

Edward E. Leamer, University of California at Los Angeles, "Theory and Evidence of Immigrant Enclaves"

Glenn Withers, "Aggregate Consequences of International Migration: Australian Analysis"

Discussants: Francine Blau, University of Illinois, and Ian Wooten

THE EFFECT OF CAPITAL FLOWS

Juan Diez-Canedo R., Banco de Mexico, "Impact of Policy Restrictions on Capital and Labor Flows in Mexico"

Rachel McCulloch, NBER and Brandeis University, "Foreign Direct Investment in the United States"

Jonathan S. Leonard, NBER and University of California at Berkeley, "Wages and Employment in Foreign Direct Investment in the United States"

Discussants: Mark Bils, NBER and University of Rochester, and Robert G. Gregory

## The Supply of Immigrants

Immigrants are self-selected in a number of ways, and this accounts for the apparent differences between their economic success and that of natives. Only a relatively small group of people decide to emigrate from any given country of origin. Further, immigrants in the United States not only chose to leave their homeland but also decided against any destination other than the United States.

Borjas analyzes the relationship between immigrants' self-selection and earnings, focusing primarily on the United States. He considers self-selection by observed characteristics, such as education, and by unobserved characteristics, such as ability and productivity. He finds that observed and unobserved self-selections are not necessarily related: the immigrant population may be selected positively on one of the dimensions of "quality" but selected negatively on the other.

Freeman, Borjas, and Lang use statistics on deaths of Mexican-born individuals to infer the number of Mexican-born living in the United States. Then, by subtracting the estimated number of Mexican-born legal residents of the United States, they calculate that there probably were fewer than two million illegals in the United States in the early 1980s. Also, the rate of growth of that group apparently has not been dramatic. Estimates based on the births to Mexican-born women are also around two million.

The authors also find that a significant proportion of the growth in apprehensions of illegal Mexicans can be attributed to increased expenditure on the border patrol, especially since 1976. Moreover, using data from a survey of illegal Mexican immigrants, Freeman, Borjas, and Lang show that the large number of apprehensions can be reconciled easily with their estimates of the number of immigrants in the United States. Finally, they find that the illegal Mexican immigrants appear to be much more permanent, and less seasonal or temporary, than is widely believed.

Bartel and Koch study the 1975–80 internal migration patterns of immigrants who arrived in the United States between 1965 and 1974. They find that the migration rates of the non-Asian immigrants are similar to the rates for the natives. The Asians, however, are considerably more mobile: the rate at which they change cities is more than double the native rate. Bartel and Koch also find that immigrants did not become more dispersed geographically between 1975 and 1980; they remain more concentrated in certain cities than the native population does.

The more educated and the younger immigrants are, the more likely they are to move. Immigrants are significantly more likely to move from cities with low foreign-born concentrations to cities with higher concentrations of immigrants. But such moves do not result in higher wages. Bartel and Koch find that wages increase only for those few immigrants who move to cities with smaller concentrations of immigrants.

## How Immigrants Fare

How do immigrants fare in their new labor markets, and to what extent does education determine their success? Chapman and Beggs find that in Australia as the measured level of schooling increases, the wage and employment experience of immigrants systematically deteriorates, relative to natives with similar characteristics. They interpret this as a consequence of the accreditation of education qualifications, the increased lack of international transferability of human capital as schooling increases, the negative association between motivation and ability on the one hand and immigrant education on the other, or the possibility that the quality of Australian schools is relatively high.

Tienda and Wilson analyze the employment and earnings consequences of internal migration decisions of black, Mexican, Puerto Rican, Cuban, and American Indian men. They ask whether the labor force participation decisions, unemployment risks, and earnings of minority men depend on whether they move between or within labor markets that have a high or low concentration of ethnic groups, and whether ethnic job queues affect these outcomes in the labor market. Tienda and Wilson find that migration has a significant negative effect on labor force participation and a positive effect on unemployment. However, if these negative effects are associated with the process of movement per se, they may be transitory and may disappear as migrants acquire experience and familiarity with their new labor markets. Tienda and Wilson find that the effects of migration on earnings are trivial.

They also uncover no evidence that spreading out (spatial assimilation) necessarily promotes socioeconomic integration, thereby reducing inequities in the ethnic labor market. According to their estimates, only Cuban men benefit economically from dispersed migration; American Indians actually may have lost earnings when they disrupted their social ties and dispersed. Tienda and Wilson conclude that there is a great deal of cultural pluralism in the labor market and that economic penalties may be associated with staying in a job typically filled by an immigrant.

Bloom and Gunderson ask how well immigrants assimilate into the Canadian labor market. After discussing the history of Canadian immigration policy and analyzing statistics on immigration flows into Canada and the characteristics of Canadian immigrants, they use 1971 and 1981 data to compare the wages of immigrants with those of native Canadians who are otherwise comparable. Bloom and Gunderson find that Canadian immigrants initially receive lower wages than native Canadians who are comparable in terms of measured characteristics. Immigrant wages rise somewhat more quickly over time than those of native Canadians do. The average "unmeasured quality" of immigrants varied little across the groups who entered the country before 1971 but was lower for post-1971 immigrants. This undoubtedly reflects the increasing proportion of immigrants admitted as relatives of Canadian citizens and landed immigrants. Finally, there is no evidence that wage dispersion for immigrants varies with time spent in Canada.

## Effects of Factor Migration

Kuhn and Wooten analyze the effects of immigration on wages when there is international trade in goods. They estimate the relatively short-run effects of immigration on the wages of native-born U.S. workers. Using 1980 data from the NBER Data Set on Trade, Immigration, and Foreign Direct Investments, they find that immigrant labor is used extensively in U.S. exports. Kuhn and Wooten predict that native workers should gain from immigration while previous immigrants and owners of capital should lose. These results suggest that the effects of immigration in the presence of international trade can be very different than in its absence.

LaLonde and Topel assess the impact of increased immigration into local labor markets on the wages and earnings of workers who are close substitutes for immigrants. They find that an increased flow of immigrants into a metropolitan area has its largest impact, although a modest one, on the earnings of other new immigrants. They estimate that the effect on wages of young native blacks and Hispanics is also small. Thus, while immigrants affect the earnings both of other immigrants and of natives, these effects are not large. Apparently immigrants are easily absorbed by the U.S. labor market.

Immigrants to Australia experience substantially above-average unemployment in their initial years of residence, but investigations of aggregate data have failed to pick up any effect of immigration on unemployment. Hughes explores this apparent paradox. He finds a negative relationship between adult male non-British immigration and aggregate unemployment and a positive relationship between adult female immigration and unemployment. Hughes suggests that recent migrants not only may experience initial higher unemployment but that they also may fill job vacancies faster than natives do.

## The Effects of Trade on Markets

How has the U.S. labor market responded to the flood of imports? Do wages in affected industries decline relatively? Are wages in unionized industries more or

less responsive to changes in product demand than wages in nonunionized industries are? Freeman and Katz examine these questions using data on changes in imports, sales, wages, and related variables from 1958 to 1984. They find that: (1) the hourly wages in U.S. industries respond significantly to changes in sales, with wages falling relatively in industries facing declines in sales because of imports or other factors; and (2) the response is greater in unionized than in nonunionized industries, apparently because union workers receive greater "rents" from which to give wage concessions when demand falls. In short, the U.S. industry wage structure is relatively flexible in response to shifts in demand caused by imports or other factors.

Abowd and Lemieux study the effects of import and export competition on collectively bargained wage settlements, employment of bargaining units, and quasi-rents of union firms in Canada from 1960 to 1986. They use quantity-based and price-based measures of international competition. They consider both the expected effects of increased international trade on new collective bargaining agreements and the realized effects of such trade over the life of existing agreements. Using quantity-based trade measures, the estimated effect of an increase in import domestic market share, holding constant the rate of growth of the domestic market, is negative for employment and quasi-rents and zero for wage rates. The estimated effect of increased export growth is positive for employment and quasi-rents but mixed for wage rates. Using price-based trade measures, there are differences depending upon whether the world price index or the price index exclusive of trade with the United States is used. Increases in either import price index are associated with increased union employment and lower wage settlements. Only increases in the non-U.S. import price index are associated with increased quasi-rents. Increases in either export price index are associated with increased union employment. Only the non-U.S. export price appears to affect wage settlements (negatively) and quasi-rents (positively).

Gregory, Anstie, and Klug analyze the wage gap between immigrants and natives in the textile, clothing, and footwear industries in the United States and Australia. In the United States, and relative to the average earnings of all male full-time workers, foreign-born male workers earn 40 percent less than they would earn in Australia. On the same basis, women in these industries in the United States earn 30 percent less than their Australian counterparts do. The difference in relative earnings across the two countries cannot be explained by differences in human capital. It seems to stem from the different labor market institutions in each country and their reflection of community attitudes toward the role of wages in income distribution.

In Australia the Arbitration Commission, which sets minimum wages for all occupations, has always pursued a policy of "comparative wage justice": setting minimum wages independently of the firm or industry and attempting to equalize the pay of similar jobs wherever those jobs occur in the economy. This can be thought of as "comparable worth" for male jobs. The Commission also has pursued a policy of applying the same criteria for paying women and men. These policies have increased the wages of the low-paid workers in Australia relative to those in the United States; immigrant and female workers have been the principal beneficiaries. In Australia, men who work in occupations and industries dominated by females are not paid less than other men are. Of course, trade flows are not independent of wage levels. Both countries have sought to protect certain industries against imports and thus support the existing wage levels. In Australia, immigrants as a group have always benefited from trade interventions. The higher the proportion of immigrant workers in a manufacturing industry, the higher the tariff level that protects that industry.

## Impacts of Immigration on Natives

Altonji and Card analyze whether the arrival of new immigrants harms or helps the existing native population. Using data from the 1970 and 1980 Censuses, they relate the fraction of immigrants in 120 major cities to the labor market outcomes of lower-wage native groups, including black men and women, white women with less than 13 years of education, and white men with less than 12 years of education. Altonji and Card find that a one percentage point increase in the share of immigrants in a city generates approximately a 1 percent increase in the supply of labor to the market in which natives are employed. In other words, immigrants do not push natives out of local labor markets. However, immigrants seem to be in more direct competition with less-skilled native women than with native men. As less-skilled natives have moved out of the low-wage service and manufacturing industries that are major employers of immigrants, these industries have grown more rapidly (or declined more slowly) in cities with more immigrants. Altonji and Card conclude that immigration probably has not had significant harmful effects on the wages or employment of less-skilled natives.

Leamer explores the implications of migrant flows that are confined to regions within a country—for example, Mexican immigration into the border areas of the United States. He distinguishes between the effects of international trade and migrant flows on border wage rates and on the commodity composition of production in both the border and the "center" areas.

Most U.S. studies use data on individuals to analyze the assimilation and relative earnings of immigrants. By contrast, Australian studies use aggregate data to measure the impact of immigration on wages and employment and its longer-term effect on per capita income. In his study, Withers finds that immigration has reduced aggregate unemployment but has not affected real wages nor increased per capita income.

## The Effect of Capital Flows

Diez-Canedo R. analyzes the quantitative dimensions of the migratory flows to the Mexican-American border and to and from the United States. He focuses mainly on migration that can be traced to the particular commercial regime of that zone, a regime that differs considerably from the one prevailing in the rest of Mexico and one that has attracted considerable labor and capital flows. In fact, the empirical evidence shows that while the rest of Mexico is in the middle of a protracted recession, the border region seems to be experiencing an economic boom.

In just a few years, the United States has emerged as the world's leading host to inward direct investment. This represents a dramatic shift from the earlier postwar period, when foreign direct investment was dominated by U.S. multinational firms. The ratio of inward to outward direct investments rose from less than one-quarter in 1977 to more than three-quarters by 1985. McCulloch reviews the forces underlying the recent surge in foreign direct investment in the United States and assesses some implications for the nation's economy, with particular reference to investments from Japan. While Japanese direct investors are a distant third (after the British and Dutch) in their U.S. holdings, the Japanese share has increased rapidly and appears to excite greater public concern than the U.S. operations of European companies do.

Foreign direct investment in the United States now approaches 10 percent of the value of listed shares on the New York Stock Exchange. Most of the recent growth has occurred through the expansion of ongoing concerns and new acquisitions rather than through start-ups. While most foreign direct investment is in manufacturing, it has grown recently in the service and trade sectors. Foreign direct investment attracts both xenophobic concern that host country workers are exploited and fawning belief that foreign management practices turn every investment into gold. Leonard examines the empirical basis for these beliefs about foreign direct investment in the United States since 1977 and finds that both lack foundation. American workers are not relatively underpaid in foreign-owned businesses. If anything, their wages have been growing faster than those of their counterparts in U.S.-owned companies. Nor do foreign owners skimp on fringe benefits. Unionism is substantially lower in foreign direct investments, but this partly reflects the more recent vintage of the investment. The comparison of relative economic success at the firm level is far more dependent on differences in accounting practices. Nevertheless, net income per worker is not consistently greater under foreign than domestic ownership, even in industries in which foreign management practices have drawn great praise, such as transportation equipment.

A conference volume on "Immigration, Trade, and Labor" will be published by the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

# Empirical Studies of Strategic Trade Policy

The NBER and the Center for Economic Policy Research (CEPR) in London cosponsored a conference on "Empirical Studies of Strategic Trade Policy" on September 17-18 in Cambridge. The program, organized by NBER Research Associates Alvin Klevorick of Yale University and Paul R. Krugman of MIT and by M. Alasdair Smith of CEPR and University of Sussex, was:

M. Alasdair Smith and Anthony J. Venables, University of Sussex and CEPR, "Trade and Industrial Policy under Imperfect Competition: Some Simulations for EEC Manufacturing"
Discussant: Richard G. Harris, Queen's University

Robert C. Feenstra, NBER and University of California at Davis, "Symmetric Pass-Through of Tariffs and Exchange Rates under Imperfect Competition: An Empirical Test" (NBER Working Paper No. 2543)
Discussant: Alberto Giovannini, NBER and Columbia University

Marvin B. Lieberman, Stanford University, "Learning-by-Doing and International Competition: Autos and Semiconductors in the United States and Japan"
Discussant: Nancy L. Rose, MIT

Richard Baldwin, NBER and Columbia University, and Paul R. Krugman, "Modeling International Competition in High Technology Industries: Lessons from Aircraft and Semiconductors"
Discussant: James A. Brander, NBER and University of British Columbia

Victor D. Norman, The Norwegian School of Economics and Business Administration, Bergen, and CEPR, "Incentive Problems in Discretionary Trade Policy: Two Examples" (Joint with Sonja Daltung and Gunnar Eskeland)
Discussant: Paul R. Krugman

Van Eugene Lambson, University of Wisconsin, and J. David Richardson, NBER and University of Wisconsin, "Tacit Collusion and Voluntary Restraint Arrangements in the U.S. Auto Market"
Discussant: Julio J. Rotemberg, NBER and MIT

Andrew S. Caplin, NBER and Princeton University, and Kala Krishna, NBER and Harvard University, "Tariffs and the Most-Favored-Nation Clause: A Game-Theoretic Approach"
Discussant: Richard Baldwin

Smith and Venables present a quantitative partial equilibrium assessment of the effects of various trade and industrial policies in the European Economic Community (EEC). In their model, industries are imperfectly competitive and experience economies of scale. Also, the world is divided into six markets: France, Germany,

Italy, the United Kingdom, the rest of the EEC, and the rest of the world. Smith and Venables apply the model to two industries: domestic electrical appliances and motor cars. They find that policy interventions generate large effects on the location of production, and on the distribution of real income, but that the effect of policy on aggregate real income (whether national or international) is typically rather modest.

Feenstra studies the effects of tariffs and exchange rates on prices of Japanese cars, trucks, and motorcycles in the United States. In particular, he finds that the long-run pass-through of tariffs and exchange rates is identical in his sample. The pass-through relationship varies across products, ranging from about 0.6 for trucks to 1.0 for motorcycles. These coefficients have very different implications for trade policy. Also the pass-through of exchange rates appears to have fallen in recent years.

In comparing the behavior of U.S. and Japanese manufacturing firms, Lieberman notes that while rates of learning, time discount, and technology diffusion obviously vary among producers within any given country, there are also important differences among countries that reflect prevailing institutions and managerial practices. He shows that Japanese advantages in efficiency have been concentrated primarily in industries that produce high-volume products that require coordination of a large number of independent manufacturing steps. When he compares the productivity record of six U.S. and Japanese automobile producers, he finds that the Japanese had significantly faster rates of learning and process improvement than the Americans did, even in the past.

Baldwin and Krugman review three issues in modeling international competition in high tech industries (defined here as industries in which investment in knowledge is a key part of the competitive process). The first issue is the relationship between technology and market structure. High front-end R and D costs and steep learning curves produce strong, dynamic economies of scale, reflected in highly concentrated market structures. In aircraft, this expectation is confirmed. In the semiconductor industry, however, there has been a puzzling coexistence between apparent strong increasing returns and a fairly large number of firms producing near-perfect substitutes.

The second issue is the dynamics of pricing. Theoretical models tell us it should be fairly flat over the product cycle; this is true for aircraft, but not for semiconductors. Third, Baldwin and Krugman show that government interventions can have large effects that are quite different from what would have occurred in more conventional industries. But in practice, interventionist policies have not benefited the intervening country.

Norman, Daltung, and Eskeland assess the potential for strategic trade policies in two industries in which Norwegian producers have significant market power: skis and Caribbean cruise shipping. In both industries, entry and costs are key issues. In the ski industry, the question is whether a merger of the two largest Norwegian producers can lower costs and raise welfare. In the Caribbean cruise market, the government can reduce costs by allowing the two large Norwegian firms to register their ships in Bermuda. The question is whether this will successfully deter entry by foreign competitors and thus raise Norwegian profits, or whether the main effect will be simply sharper competition between Norwegian firms. Norman, Daltung, and Eskeland find that in theory Norway might gain by departing from free trade. The nature of the optimum intervention is highly sensitive to the specification of the market game; even minor modifications in the rules of the game may reverse the policy implications. Moreover, only the market agents themselves are likely to possess the information needed to formulate policy, and typically they will have incentives to misrepresent the market conditions. As a consequence, discretionary trade policies are likely to be misdirected.

Lambson and Richardson model the auto industry as a tacitly collusive sector, with collusion enforced by the threat of penalties for cheating. In such collusive models, it is by no means necessary that an import quota or voluntary restraint agreement (VRA) will raise prices or strengthen industry collusion. The model is calibrated to U.S. data both before and after the imposition of the VRA on Japanese exports to the United States. The VRA effectively limited the capacity of Japanese firms to sell in the U.S. market; this raised the profits of the U.S. firms under collusion but also limited the ability of collusive firms to punish defectors. Thus, the overall effect on the collusiveness of the industry is ambiguous.

Caplin and Krishna consider the role of the Most-Favored-Nation (MFN) Clause in setting tariffs. In a static tariff-setting game, the MFN may raise *all* tariffs and this may raise rather than lower welfare. In a cooperative Nash bargaining framework, the inability to internalize gains from setting tariffs by bilateral bargaining caused by the presence of MFN raises tariffs and reduces welfare. In a noncooperative model of bargaining, MFN affects the structure of bargaining power. The ability to free-ride on agreements made by others provides an "outside option" that changes the bargaining power of countries.

In addition to those already mentioned, conference participants included: Heather A. Hazard and Dani Rodrik, Harvard University; Gernot Klepper, Insititute of World Economics, Kiel; Richard C. Levin, NBER and Yale University; and Catherine L. Mann, Federal Reserve Board.

# Money in Historical Perspective: A Conference in Honor of Anna J. Schwartz

(Reported by Michael D. Bordo)

On October 6, 1987, Anna J. Schwartz was honored at a conference that was organized by Michael D. Bordo, NBER, Carnegie-Mellon University, and the University of South Carolina, and Milton Friedman of the Hoover Institution.

Schwartz was a research associate at the NBER for over 45 years and is now a research associate emerita. Her achievements include three books written with Milton Friedman for the Bureau's Money and Business Cycle project: *A Monetary History of the United States: 1867 to 1960* (1963); *Monetary Statistics of the United States* (1970); *Monetary Trends in the United States and in the United Kingdom, 1870-1970* (1982); as well as several other Bureau volumes and numerous journal articles.

The conference gathered together Anna's close colleagues and co-authors from over the years to present and discuss five papers on themes close to her research interests:

SESSION I: HISTORICAL PERSPECTIVES

Chairman: W. W. Rostow, University of Texas at Austin

Michael D. Bordo, "The Contribution of *A Monetary History of the United States: 1867 to 1960* to Monetary History"
Discussant: Hugh Rockoff, NBER and Rutgers University

Forrest H. Capie and Geoffrey E. Wood, City University Business School, London, "Anna Schwartz's Perspective on British Economic History"
Discussant: David Laidler, University of Western Ontario

SESSION II: INTERNATIONAL MONETARY PERSPECTIVES

Chairman: Solomon Fabricant, NBER and New York University

Allan H. Meltzer and Saranna Robinson, Carnegie-Mellon University, "Stability under the Gold Standard in Practice"
Discussant: William Poole, NBER and Brown University

Michael R. Darby, NBER and U.S. Department of the Treasury, and James R. Lothian, Citicorp Investment Bank, "International Transmission Afloat"
Discussant: Alan C. Stockman, NBER and University of Rochester

SESSION III: MONETARIST PERSPECTIVES

Chairman: Robert E. Lipsey, NBER and Queens College

Phillip D. Cagan, Columbia University, "Money-Income Causality—A Critical Review of Literature since the *Monetary History*"
Discussant: Robert E. Rasche, NBER and Michigan State University

Bordo's paper assesses the role of *A Monetary History*... as a progenitor of research in monetary history. The paper critically surveys the literature on three major themes in the book: monetary disturbances; the domestic monetary framework and monetary policy; and monetary standards. This book is a unique blend of theory, data, and history. It contains a portrayal of the historical circumstances of monetary disturbances and of alternative institutional arrangements. The book has had a major impact on modern macroeconomic research and spawned a growth industry in monetary history.

Capie and Wood examine the contribution of two studies on the British economy in which Schwartz collaborated: with A. D. Gayer and W. W. Rostow, *Growth and Fluctuation of the British Economy 1750-1850: An Historical, Statistical, and Theoretical Study of Britain's Economic Development*, Oxford (1953), and with Milton Friedman, *Monetary Trends in the United States and in the United Kingdom, 1870-1970*, NBER, Chicago (1982). The Gayer-Rostow-Schwartz volume provides an important link between earlier approaches to the business cycle and current theories that are based on rational expectations. *Monetary Trends*... has sparked a vigorous debate in the United Kingdom over its principal findings of long-run stability of the demand for money and the neutrality of money.

Meltzer and Robinson use a multistate Kalman filter procedure to compare forecast errors for the level and rates of change of real output and the price level (as measures of variability and uncertainty) for different monetary regimes in seven countries. The results show that for most countries the variability of both levels and growth rates of real output were lower in the post-World

*Left to right:* Michael Bordo, Milton Friedman, Anna Schwartz, Martin Feldstein, and Rose Friedman

War II period than under the classical gold standard; in some countries the variability of real output was lower in the recent period of fluctuating exchange rates than under the Bretton Woods Agreement. The authors also find price level and inflation variability to be lower in the post-World War II period, and especially under floating exchange rates, than under the gold standard in the majority of countries—with the principal exception of the United Kingdom. The latter set of results is contrary to the widely held view that the gold standard fostered long-run price stability.

To determine whether the advent of floating exchange rates in 1973 led to increased monetary independence, Darby and Lothian compare the behavior (between the Bretton Woods Agreement and the subsequent period of floating exchange rates) of a number of policy and other important economic variables across a sample of 20 OECD countries. The greater variability of, and lower correlation between, long-term measures of nominal variables under floating than under fixed rates implies increased monetary independence in the long run. In the short run, there is evidence for the persistence of international linkages under flexible rates. However, these results can be explained better by the monetary authorities' reaction to foreign developments than by the operation of the traditional transmission mechanism.

Cagan critically evaluates the literature concerning the effect of money on income. His survey criticizes earlier studies by Kaldor and Tobin that made the case for an endogenous money supply, the more recent use of bivariate Granger causality tests, and studies employing vector autoregression (VAR). Cagan argues that the result of recent VAR studies, which imply a minor role for monetary shocks in explaining changes in real activity, are largely spurious. These results reflect both the filtering techniques employed and the masking of monetary influences by innovations in interest rates, in turn a reflection of monetary policy. In lieu of sole reliance on time-series methods, Cagan advocates the use of the historical approach followed by Friedman and Schwartz in *A Monetary History of the United States*.

The conference ended with a dinner at which Martin Feldstein, Karl Brunner, and Milton Friedman spoke. Then Schwartz was presented with a prepublication copy of a collection of her articles, *Money in Historical Perspective*, which is now available from the University of Chicago Press.

In addition to those already mentioned, conference participants included: Rachel Balbach, Centerre Bank, N.A.; George J. Benston, Emory University; George Borts and Jerome L. Stein, Brown University; Charlotte F. Boschan and Geoffrey H. Moore, Columbia University; Geoffrey Carliner, NBER; Ehsan U. Choudhri, Carleton University, Ottawa; James A. Dorn, Cato Institute; David I. Fand, Wayne State University; Benjamin M. Friedman, NBER and Harvard University; Arthur Gandolfi, E. F. Hutton; Guy-Georges Herregat, Credit du Nord; Robert Hetzel, Federal Reserve Bank of Richmond; Doris Ikle, Conservation Management Corp.; Levis A. Kochin, University of Washington; Alvin L. Marty, City University, London; Bennett T. McCallum, NBER and Carnegie-Mellon University; Cornelia McCarthy, Citicorp Investment Bank; A. James Meigs, Princeton University; David I. Meiselman, Virginia Polytechnic Institute; Gerald P. O'Driscoll, Jr., Federal Reserve Bank of Dallas; Leif H. Olsen, Leif H. Olsen Associates; Mark Perlman, University of Pittsburgh; Paul A. Wachtel, NBER and New York University; and Lawrence H. White, New York University.

A volume based on this conference will be published by the University of Chicago Press. Its availability will be announced in a forthcoming issue of the *NBER Reporter.*

# Tax Policy and the Economy

One hundred members of the business, government, and legal communities attended NBER's second annual conference on Tax Policy and the Economy in Washington on November 17. The conference was organized by NBER Research Associate Lawrence H. Summers of Harvard University. The following papers were presented:

B. Douglas Bernheim, NBER and Stanford University, "Budget Deficits and the Balance of Trade"

James R. Hines, Jr., NBER and Princeton University, "Taxation and U.S. Multinational Investments"

Don Fullerton, NBER and University of Virginia, and Andrew B. Lyon, NBER and University of Maryland, "Tax Neutrality and Intangible Capital" (NBER Working Paper No. 2430)

Roger H. Gordon and Joel B. Slemrod, NBER and University of Michigan, "On the Peculiar Implications of Taxing Interest Income"

Lawrence B. Lindsey, NBER and Harvard University, "Did ERTA Raise the Share of Taxes Paid by Upper-Income Taxpayers? Will the Tax Reform Act of 1986 Be a Repeat?"

Laurence J. Kotlikoff, NBER and Boston University, and David A. Wise, NBER and Harvard University, "Pension Backloading, Wage Taxes, and Work Disincentives" (NBER Working Paper No. 2463)

Bernheim uses information for the United States and its five leading trading partners—Japan, West Germany, Canada, the United Kingdom, and Mexico—to evaluate the impact of changes in budget deficits on trade deficits. He examines the effects of changes in

budget deficits both within individual countries and across countries. Bernheim concludes that "fiscal deficits significantly contribute to the deterioration of the current account. Indeed, it appears that U.S. budget deficits have been responsible for roughly one-third of the U.S. trade deficit in recent years."

Hines assesses the impact of the 1986 Tax Reform Act on the incentives faced by multinational corporations. He finds that U.S. taxes have tended to discourage investment by U.S. firms in countries with substantial investment incentives. He argues, however, that the 1986 Act "all but relieves most U.S. multinationals of U.S. tax obligations on their foreign income." He suggests that this will make foreign investment decisions of U.S. companies more dependent on foreign tax rules and less dependent on American tax policies.

Fullerton and Lyon note that previous analyses of various tax provisions have concentrated on their effects on physical investments in new plants and equipment. They argue that intangible investments in research and development, advertising, marketing, or worker training are also important, and that it is necessary to consider these types of investments in evaluating tax policies. After estimating the stock of intangible capital, Fullerton and Lyon reconsider the effects of the 1986 Act on economic efficiency. They find that the Act increases production efficiency. However, they note that the efficiency effects of eliminating the investment tax credit are reduced or possibly eliminated once intangible capital is taken into consideration.

Gordon and Slemrod focus on the problem of "tax arbitrage" in connection with the taxation of interest income. Tax arbitrage arises when interest deductions are taken at a rate higher than the one at which interest income is taxed. For example, tax arbitrage can occur when an untaxed pension fund buys the bonds of a profitable corporation that deducts interest expenses. Gordon and Slemrod find that "taxing real rather than nominal interest would have raised tax revenues by $25.7 billion in 1983." Exempting financial assets and liabilities from taxes, and taxing only cash flows from real capital, would have raised tax revenues by $9.1 billion. However, Gordon and Slemrod note that such a reform would benefit high-bracket taxpayers at the expense of those in lower tax brackets.

Lindsey shows that the amount of wage and salary income reported by high-bracket taxpayers rose sharply following the implementation of ERTA. Partially as a result of this, tax collections from top-bracket taxpayers actually rose following the reduction in the top rate from 70 to 50 percent. Lindsey suggests that the increase in wages and salaries probably resulted from some combination of a shift in compensation away from fringe benefits and deferred payments toward wages and salaries, and from some increase in labor supply. He estimates that reduced top rates in the 1986 Act will result in a significant increase in the reported wage and salary income of top-bracket taxpayers. However, he believes that this effect is likely to be more than offset by decreases in collections of capital gains taxes caused by increased capital gains tax rates.

Kotlikoff and Wise examine the impact of private pensions on the behavior of older workers. They find that despite ERISA regulations, which appear to mandate that benefit accruals occur smoothly over time, workers' benefits under many private pension plans are very sensitive to the lengths of their working lives. Kotlikoff and Wise find that many pension plans encourage early retirement and that these incentives are much greater than those created by Social Security.

These papers will be published by the MIT Press in an NBER annual volume titled *Tax Policy and the Economy.*

# 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 1988 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.

**March 4, 1988**
Program Meeting: Productivity, NBER

**March 11-12, 1988**
Annual Conference on Macroeconomics, NBER

**March 18, 1988**
InterAmerican Seminar on Economics, NBER

**March 23-24, 1988**
Program Meeting: International Taxation, NBER

**March 24-25, 1988**
Program Meeting: Taxation, NBER

**April 7-8, 1988**
Panel on Economic Activity, Brookings Institution

**April 15, 1988**
Economic Fluctuations, NBER

**April 22-23, 1988**
Public Policy Conference, Carnegie-Mellon University-University of Rochester

**April 29-30, 1988**
Universities Research Conference on Trade Policies for International Competitiveness, NBER*

**May 5-6, 1988**
World Capital Market Integration, NBER

**May 12-13, 1988**
Income and Wealth: 50th Anniversary Conference, NBER

**May 19-21, 1988**
The Economics of Aging, NBER

**June 2-3, 1988**
Evolution of Firms and Industries, NBER

**June 2-4, 1988**
Conference on Public Finance, NBER

**June 8-10, 1988**
International Seminar on Macroeconomics, NBER

**June 23-25, 1988**
Second Annual Meeting, European Society for Population Economics*

**June 30-July 3, 1988**
Annual Meeting, Western Economic Association*

**July 11-August 19, 1988**
Summer Institute, NBER

**August 8-11, 1988**
Annual Meeting, American Statistical Association*

**September 15-16, 1988**
Panel on Economic Activity, Brookings Institution

**September 25-28, 1988**
81st Annual Conference, National Tax Association-Tax Institute of America*

**September 25-28, 1988**
Annual Meeting, National Association of Business Economists*

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

**October 7-8, 1988**
Conference on Housing, NBER

**October 27-29, 1988**
International Policy Coordination and Exchange Rate Fluctuations, NBER

**November 15, 1988**
Tax Policy and the Economy, NBER

**November 16-17, 1988**
Compensation Policy and Firm Performance, NBER

**November 18, 1988**
Program Meeting: Labor Studies, NBER

**November 20-22, 1988**
Annual Meeting, Southern Economic Association*

**December 16-17, 1988**
Universities Research Conference, NBER*

**January 6-7, 1989**
Conference on Savings, NBER

**August 14-17, 1989**
Joint Statistical Meetings, American Statistical Association*

**September 17-20, 1989**
Annual Meeting, National Association of Business Economists*

**October 8-11, 1989**
82nd Annual Conference, National Tax Association-Tax Institute of America*

**November 19-21, 1989**
Annual Meeting, Southern Economic Association*

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

# Bureau News

## Program Meeting on Taxation

NBER's Program in Taxation met in Cambridge on November 5 and 6 to discuss recent research. Program Director David F. Bradford, Princeton University, organized the meeting. The agenda was:

James M. Poterba and Julio J. Rotemberg, NBER and MIT, "Inflation, Tax Rates, and Optimizing Government"
Discussant: John B. Shoven, NBER and Stanford University

# 1988 Research Associates

Andrew B. Abel
John M. Abowd
Katharine G. Abraham
Joshua Aizenman
Steven G. Allen
Albert Ando
Orley C. Ashenfelter
Alan J. Auerbach
Carliss Y. Baldwin
Robert E. Baldwin
Robert J. Barro
Ann P. Bartel
Ben S. Bernanke
Ernst R. Berndt
B. Douglas Bernheim
Olivier J. Blanchard
Alan S. Blinder
David E. Bloom
Zvi Bodie
Michael D. Bordo
George J. Borjas
Michael J. Boskin
David F. Bradford
James A. Brander
William H. Branson
Timothy F. Bresnahan
Charles C. Brown
Willem H. Buiter
Jeremy I. Bulow
John Y. Campbell
David Card
Dennis W. Carlton
Gary Chamberlain
Kim B. Clark
Charles T. Clotfelter
Douglas Coate
Hope Corman
Lance E. Davis
Jorge de Macedo
Angus Deaton
Michael Denny
William T. Dickens
W. Erwin Diewert
Rudiger Dornbusch
Bernard Dumas
Jonathan Eaton
Sebastian Edwards
Ronald G. Ehrenberg
Barry J. Eichengreen
Stanley L. Engerman
Robert F. Engle III
Ray C. Fair
Henry S. Farber
Daniel R. Feenberg
Robert C. Feenstra
Martin Feldstein
Stanley Fischer
Franklin M. Fisher
Marjorie Flavin
Robert P. Flood, Jr.
Roderick Floud
Robert W. Fogel
Richard G. Frank
Jeffrey A. Frankel
Richard B. Freeman
Benjamin M. Friedman
Victor R. Fuchs
Don Fullerton
Melvyn A. Fuss
David W. Galenson
Robert E. Gallman
Alan M. Garber
Francesco Giavazzi
~~Stephen Goldfeld~~
Claudia Goldin
Fred Goldman
Robert J. Gordon
Roger H. Gordon
John W. Graham III
Jerry R. Green
Zvi Griliches
Reuben Gronau
Gene M. Grossman
Herschel I. Grossman
Michael Grossman
Sanford J. Grossman
Alan L. Gustman
Michael R. Haines
Robert E. Hall
Daniel S. Hamermesh
Lars P. Hansen
Jeffrey E. Harris, M.D.
Jerry A. Hausman
Fumio Hayashi
James J. Heckman
John F. Helliwell
Elhanan Helpman
Patric H. Hendershott
Dale W. Henderson
J. Vernon Henderson
Robert J. Hodrick
Charles Y. Horioka
R. Glenn Hubbard
Charles R. Hulten
Michael D. Hurd
Robert P. Inman
Yannis Ioannides
Takatoshi Ito
George E. Johnson
Theodore J. Joyce
Kenneth L. Judd
Edward J. Kane
James R. Kearl
Mervyn A. King
Alvin K. Klevorick
Laurence J. Kotlikoff
Irving B. Kravis
Anne O. Krueger
Paul R. Krugman
Edward P. Lazear
John B. Legler
Jonathan S. Leonard
Richard M. Levich
Richard Levin
Eugene M. Lewit
Frank R. Lichtenberg
~~Jay O. Light~~
Robert E. Lipsey
Robert E. Lucas, Jr.
Harold S. Luft
Thomas E. MaCurdy
N. Gregory Mankiw
Charles F. Manski
Robert A. Margo
Nancy P. Marion
Terry A. Marsh
Richard C. Marston
Bennett T. McCallum
Rachel McCulloch
Robert L. McDonald
Daniel McFadden
Charles E. McLure, Jr.
James L. Medoff
Angelo Melino
Robert C. Merton
Jacob A. Mincer
Frederic S. Mishkin
Olivia S. Mitchell
Robert A. Moffitt
Catherine J. Morrison
Stewart C. Myers
M. Ishaq Nadiri
Charles R. Nelson
William D. Nordhaus
Maurice Obstfeld
Ariel Pakes
John H. Pencavel
James E. Pesando
Robert S. Pindyck
A. Mitchell Polinsky
William Poole
Clayne L. Pope
Richard Portes
James M. Poterba
Samuel H. Preston
Robert H. Rasche
Assaf Razin
J. David Richardson
Hugh T. Rockoff
Kenneth S. Rogoff
V. Vance Roley
Harvey S. Rosen
Sherwin Rosen
Julio J. Rotemberg
Michael Rothschild
Richard S. Ruback
Jeffrey D. Sachs
Henry Saffer
David S. Salkever
Thomas J. Sargent
Ryuzo Sato
Mark A. Schankerman
Myron S. Scholes
Nevin S. Scrimshaw
Robert A. Shakotko
Carl Shapiro
Steven Shavell
Robert J. Shiller
John B. Shoven
Christopher A. Sims
Kenneth J. Singleton
Joel B. Slemrod
Kenneth Sokoloff
A. Michael Spence
Barbara J. Spencer
Richard H. Steckel
R. Knight Steel, M.D.
Joseph E. Stiglitz
Alan C. Stockman
Lawrence H. Summers
Lars E. O. Svensson
Richard E. Sylla
Robert A. Taggart, Jr.
Paul J. Taubman
John B. Taylor
Peter Temin
Marie C. Thursby
Robert H. Topel
T. James Trussell
~~Stephen J. Turnovsky~~
Steven F. Venti
~~W. Kip Viscusi~~
Paul Wachtel
Kenneth W. Wachter
Roger N. Waud
Thomas J. Weiss
John Whalley
Larry T. Wimmer
David A. Wise
Ann Dryden Witte
Barbara L. Wolfe
Tadashi Yamada
Victor Zarnowitz
Richard J. Zeckhauser

Lawrence H. Goulder, NBER and Harvard University, and Barry J. Eichengreen, NBER and University of California, Berkeley, "Savings Promotion, Investment Promotion, and International Competitiveness"

Discussant: Marc Robinson, General Motors Research Laboratories

B. Douglas Bernheim, NBER and Stanford University, "Social Security Benefits: An Empirical Study of Expectations and Realizations" (NBER Working Paper No. 2257)

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

Jane G. Gravelle, Congressional Research Service, and Laurence J. Kotlikoff, NBER and Boston University, "The Incidence and Efficiency Costs of Corporate Taxation When Corporate and Noncorporate Firms Produce the Same Good" (NBER Working Paper No. 2462)

Discussant: Joseph A. Pechman, The Brookings Institution

Michael J. Boskin, NBER and Stanford University, Marc Robinson, and Alan M. Huber, Stanford University, "Government Saving, Capital Formation, and Wealth in the United States, 1947–1985" (NBER Working Paper No. 2352)

Michael J. Boskin, "Concepts and Measures of Deficits and Debt and Their Impact on Economic Activity" (NBER Working Paper No. 2332)

Discussant (for both Boskin papers): R. Glenn Hubbard, NBER and Northwestern University

Don Fullerton, NBER and University of Virginia, and Yolanda K. Henderson, Federal Reserve Bank of Boston, "The Marginal Excess Burden of Different Capital Tax Instruments" (NBER Working Paper No. 2353)

Discussant: Charles L. Ballard, Michigan State University

Alan J. Auerbach, NBER and University of Pennsylvania, "The Deadweight Loss from Capital Income Taxation"

Discussant: Arnold Harberger, Stanford University

Poterba and Rotemberg test the hypothesis that governments equate the cost of inflation, in terms of marginal efficiency, with the cost of tax finance. Governments can raise revenues either by printing money or by levying taxes, so these two instruments should have equal marginal costs if the government is attempting to minimize the total welfare cost of a given spending program. Using data from five countries, Poterba and Rotemberg find that inflation and tax rates in the United States and Japan appear to move together, as the theory predicts. However, inflation and tax rates are negatively associated in Germany, France, and Britain. The results cast doubt on a simple model of inflation and tax finance.

Goulder and Eichengreen find that subsidies to domestic private saving, and credits to domestic investment, have very different effects on "international competitiveness" in both the short and the long run. The differences reflect the opposite implications for international capital flows of policies promoting saving versus those promoting investment. In the short term, subsidies to domestic saving lead to diminished demand for U.S. assets by foreigners, as increased saving by domestic households lowers aftertax returns on foreigners' investments in the United States. This implies a weaker dollar, cheaper exports, and higher demand for exports. Tax credits to domestic investment, on the other hand, encourage higher foreign investment in the United States and lead to a stronger dollar and lower exports. In the long run, however, savings subsidies discourage exports while investment tax credits support them. This reflects the opposite long-term implications of the two types of policies for net foreign income and for the capital account of the balance of payments.

Bernheim uses data from the Retirement History Survey to study the accuracy of preretirement expectations of benefits. He finds that survey responses to questions about expected benefits explain roughly 60 percent of the variance in realizations of benefits. Consumers do not form expectations on the basis of all available information. Proper adjustment of their forecasts for information contained in concurrent Social Security entitlements could reduce the forecast errors, but the potential gains from incorporating other information are minimal. Individuals do not ignore or forget information that they have used in the past, and they tend to form all expectations on the basis of the same information. Given the information that people use, their expectations are highly accurate. Extreme optimism is uncommon. Surprisingly, expectations were not abnormally inaccurate during periods of rapid legislative change. Finally, widows and single men tend to make both the most conservative and the most accurate forecasts of Social Security benefits. Married men are the least conservative and least accurate. Neither wealth nor education is associated with accuracy.

Gravelle and Kotlikoff present a two-good model with corporate and noncorporate production of both goods. The incidence of the corporate tax in their model can differ markedly from that in the Harberger model: it may fall 100 percent on capital, regardless of sector differences in substitution elasticities. This result holds for a large class of production functions if each sector initially has the same capital shares and the same corporate share of output. The difference between the two models in the deadweight loss from corporate taxation is also striking: the deadweight loss is over ten times larger in the Gravelle-Kotlikoff model than in the Harberger model. In the Harberger model only the difference in the average corporate tax in the two sectors is distortionary; the entire tax is distortionary in the authors' model.

Boskin, Robinson, and Huber present new estimates of various components of governments' contribution to national wealth and its growth in the postwar period. They find that the federal government's assets grew more rapidly than the national debt in the 1970s. By 1980, federal tangible assets amounted to $1.7 trillion and financial assets $940 billion, compared to liabilities of $1.5 trillion (in 1985 dollars). Since 1980, however, conventional liabilities have grown much faster than assets, causing about a $727 billion decline in federal "net worth."

They also find that state-local fixed reproducible capital was about $1.9 trillion in 1985. The estimated "net worth" of state-local governments was $2.5 trillion in both 1980 and 1985. Including consumer durables and government tangible investment raises the national saving rate substantially. In 1985, the gross and net saving rates would rise from a traditionally measured 13.8 percent and 3.2 percent to 24.5 percent and 8.8 percent, respectively.

In the next paper, Boskin extends the National Income Accounts to include a consistent treatment of consumer durables and government capital in the measurement of consumption and income, and explicitly tests alternative propositions about the effects of government financial policy on real economic activity. He finds that a tax cut, holding government consumption constant, increases consumption by about 40 cents on the dollar. He also estimates that the propensity to consume out of Social Security wealth is about half that of regular private wealth. The estimated impact of changes

in net government explicit assets—the value of government tangible capital over and above regular debt—is quite similar to the propensity to consume out of private wealth. This suggests that government tangible assets substitute for private saving. Boskin also calculates that a $1 increase in the deficit, controlling for the level of economic activity, is associated with about a 30 cent increase in private saving, about a 35 cent decrease in domestic investment, and about a 25 cent decrease in net foreign investment.

Fullerton and Henderson point out that there is no well-defined way to raise capital taxes in general, because the taxation of income from capital depends on many different policy instruments including: the statutory corporate income tax rate; the investment tax credit rate; depreciation lifetimes; declining balance rates for depreciation allowances; and personal tax rates on noncorporate income, interest receipts, dividends, and capital gains. The authors use a general equilibrium model to measure the marginal excess burden for each of these different capital tax instruments. They find that an increase in the corporate tax rate has the highest marginal excess burden, because it distorts intersectorial and interasset decisions as well as intertemporal decisions. At the other extreme, a reduction in the investment tax credit has a negative marginal excess burden because it raises revenue while reducing interasset distortions more than it increases intertemporal distortions. In general, marginal excess burdens of different capital tax instruments vary significantly. They can be more or less than the marginal excess burden of the payroll tax or the progressive personal income tax.

Auerbach develops an overlapping-generations model with a detailed input-output production structure that is capable of simultaneously measuring the deadweight costs of capital tax distortions across assets, industries, and time. He then evaluates the strength of the argument for uniform capital taxation and the impact of the recent U.S. tax changes on each component of the deadweight loss. One of his conclusions is that "optimal tax" arguments in favor of production distortions, although theoretically sound, are empirically unimportant.

Other program members participating in the meeting were: Daniel R. Feenberg, NBER; Martin Feldstein, Lawrence B. Lindsey, N. Gregory Mankiw, and Richard Ruback, Harvard University; Jerry A. Hausman, MIT; Patric H. Hendershott, Ohio State University; James R. Hines, Jr., and Harvey S. Rosen, Princeton University; Douglas Holtz-Eakin, Columbia University; R. Glenn Hubbard, Northwestern University; Andrew B. Lyon, University of Maryland; Jeffrey Mackie-Mason, University of Michigan; Robert Moffitt, Brown University; and Jonathan S. Skinner, University of Virginia. Guests included William Andrews, Harvard Law School, and Michael Graetz, Yale University.

# Labor Economists Hold Fall Meeting

NBER's Program in Labor Studies, directed by Richard B. Freeman of Harvard University, met in Cambridge on November 13. The day's discussion focused on four papers:

Edward P. Lazear, NBER and University of Chicago, "Job Security and Unemployment"

Charles C. Brown, NBER and University of Michigan, "Firms' Choice of Method of Pay"

Daniel S. Hamermesh, NBER and Michigan State University, "Labor Demand and the Structure of Adjustment Costs"

Robert Gibbons, NBER and MIT, and Lawrence F. Katz, NBER and Harvard University, "Learning, Mobility, and Interindustry Wage Differences"

European countries have enacted various job security provisions over the last 30 years. Now employers are required to give workers severance pay when they are let go and/or to give them advance notice of termination. Lazear finds that requiring severance pay reduces European unemployment substantially. Notice provisions appear mainly to reduce hours worked: firms switch from full-time, permanent workers who are covered by these provisions to part-time, temporary workers who are exempt from them.

Piece rates tie pay directly to output while "time rates" pay a given wage per period worked. There are two types of time-rate workers: those who receive merit pay based on previous performance and those who receive only standard rates because their wages are tied to their jobs but not to their performance. One would expect a merit pay system to rank somewhere between piece rates and standard rates in allowing a firm to attract better workers and to motivate them. However, Brown shows that the merit pay system offers *lower* wages than either piece rate or standard rate among employers in the same industry. He also finds that larger establishments use merit pay less and use standard rates and piece rates more. Unions also favor standard rates at the expense of merit pay. Finally, establishments with larger fractions of female workers are more likely to use piece rates and may be more likely to use standard rates.

Hamermesh studies the costs that firms face when the demand for labor is affected by changes (shocks) in the demand for output and other factors. He shows that the adjustment process is "jumpy." That is, employment does not change in response to small shocks to demand. However, if the shocks are large, employment moves instantaneously to a new long-run equilibrium level. Earlier studies assumed that adjustment was smooth, because this up-and-down movement over the various units that experienced the shocks was aggregated.

Several studies have shown that there are large and persistent wage differentials among industries, even after differences in worker and job characteristics are removed. Gibbons and Katz explore the possibility that such wage differentials are the result of unmeasured differences in workers' productive abilities. They present new evidence against this view and tentatively conclude that interindustry wage differences for workers who appear to be equivalent are not primarily the result of unmeasured differences in their productive abilities.

Additional labor program members participating in the day's discussion were: John M. Abowd and Ronald G. Ehrenberg, Cornell University; Katharine G. Abraham, The Brookings Institution; Debra Aron, Northwestern University; David E. Bloom, Columbia University; Zvi Griliches and David A. Wise, Harvard University; George J. Borjas, University of California at Santa Barbara; David Card, Princeton University; Geoffrey Carliner, NBER; Henry S. Farber and Lisa Lynch, MIT; Wayne B. Gray, Clark University; George Johnson, University of Michigan; Shulamit Kahn, Boston University; Mark R. Killingsworth, Rutgers University; Morris Kleiner, University of Kansas; and Steven F. Venti, Dartmouth College. Also attending were Alan B. Krueger of Princeton University and Kevin Murphy of Harvard University.

# Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-893 and contain abstracts of the Working Papers cited below.)

These reprints are free of charge to corporate associates and other sponsors of the National Bureau. For all others there is a charge of $2.00 per reprint to defray the costs of production, postage, and handling. Advance payment is required on orders totaling less than $10.00. Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

894. "Interindustry Wage Differences and Industry Characteristics," by William T. Dickens and Lawrence F. Katz, 1987 (NBER Working Paper No. 2014)

895. "New Directions in the Relation between Public and Private Debt," by Benjamin M. Friedman, 1987 (NBER Working Paper No. 2186)

896. "Government Purchases and Real Interest Rates," by N. Gregory Mankiw, 1987 (NBER Working Paper No. 2009)

897. "Capital Controls and Covered Interest Parity between the Dollar and the Yen," by Takatoshi Ito, 1986 (NBER Working Paper No. 1187)

898. "Capital Flows, Investment, and Exchange Rates," by Alan C. Stockman and Lars E. O. Svensson, 1987 (NBER Working Paper No. 1598)

899. "Optimal Monetary Policy and Wage Indexation under Alternative Disturbances and Information Structures," by Stephen J. Turnovsky, 1987 (NBER Working Paper No. 2042)

900. "The Rigidity of Prices," by Dennis W. Carlton, 1986 (NBER Working Paper No. 1813)

901. "Time to Build, Option Value, and Investment Decisions," by Saman Majd and Robert S. Pindyck, 1987 (NBER Working Paper No. 1654)

902. "The Open Economy: Implications for Monetary and Fiscal Policy," by Rudiger Dornbusch and Stanley Fischer, 1986 (NBER Working Paper No. 1422)

903. "The Behavior of Money Stock under Interest Rate Control: Some Evidence for Canada," by Michael D. Bordo, Ehsan U. Choudhri, and Anna J. Schwartz, 1987 (NBER Working Paper No. 1480)

904. "A Dynamic Specific-Factors Model of International Trade," by Jonathan Eaton, 1987 (NBER Working Paper No. 1479)

905. "Savings of the Elderly and Desired Bequests," by Michael D. Hurd, 1987 (NBER Working Paper No. 1826)

906. "Reputational Constraints on Monetary Policy," by Kenneth Rogoff, 1987 (NBER Working Paper No. 1986)

907. "A Guide to Target Zones," by Jacob A. Frenkel and Morris Goldstein, 1986 (NBER Working Paper No. 2113)

908. "The International Monetary System: Should It Be Reformed?" by Jacob A. Frenkel, 1987 (NBER Working Paper No. 2163)

909. "The Expected Present Discounted Value of Profits and the Cyclical Variability of Investment," by Andrew B. Abel and Olivier J. Blanchard, 1986 (NBER Working Paper No. 1122)

910. "Why Have Corporate Tax Revenues Declined?" by Alan J. Auerbach and James M. Poterba, 1987 (NBER Working Paper No. 2118)

911. "The Effect of Federal Tax Deductibility on State and Local Taxes and Spending," by Martin Feldstein, 1987 (NBER Working Paper No. 1791)

912. "Capital Accumulation and Annuities in an Adverse Selection Economy," by Martin S. Eichenbaum and Dan S. Peled, 1987 (NBER Working Paper No. 2046)

913. "Beer Taxes, the Legal Drinking Age, and Youth Motor Vehicle Fatalities," by Henry Saffer and Michael Grossman, 1987 (NBER Working Paper No. 1914)

914. "Explorations in Monetary History: A Survey of the Literature," by Michael D. Bordo, 1986 (NBER Working Paper No. 1821)

915. "The Adjustment of Expectations to a Change in Regime: A Study of the Founding of the Federal Reserve," by N. Gregory Mankiw, Jeffrey A. Miron, and David N. Weil, 1987 (NBER Working Paper No. 2124)

916. "Does the Tax System Favor Investment in High Tech or Smokestack Industries?" by Don Fullerton and Andrew B. Lyon, 1986 (NBER Working Paper No. 1600)

917. "The Impact of Fundamental Tax Reform on the Allocation of Resources," by Don Fullerton and Yolanda K. Henderson, 1987 (NBER Working Paper No. 1904)

918. "Immigrants, Minorities, and Labor Market Competition," by George J. Borjas, 1987 (NBER Working Paper No. 2028)

919. "The Impact of Induced Abortion on Black and White Birth Outcomes in the United States," by Theodore J. Joyce, 1987 (NBER Working Paper No. 1757)

920. "Money and Interest in a Cash-in-Advance Economy," by Robert E. Lucas, Jr. and Nancy L. Stokey, 1987 (NBER Working Paper No. 1618)

921. "Job Duration, Seniority, and Earnings," by Katharine G. Abraham and Henry S. Farber, 1987 (NBER Working Paper No. 1819)

922. "Optimal Monetary Growth," by Andrew B. Abel, 1987 (NBER Working Paper No. 2136)

923. "Optimal Monetary Growth with Accommodating Fiscal Policy in a Small Open Economy," by Stephen J. Turnovsky, 1987 (NBER Working Paper No. 2084)

924. "Permanent and Transitory Components in Macroeconomic Fluctuations," by John Y. Campbell and N. Gregory Mankiw, 1987 (NBER Working Paper No. 2169)

925. "Social Security and Individual Welfare: Precautionary Saving, Borrowing Constraints, and the Payroll Tax," by R. Glenn Hubbard and Kenneth L. Judd, 1987 (NBER Working Paper No. 1736)

926. "A Reappraisal of Recent Tests of the Permanent-Income Hypothesis," by Charles R. Nelson, 1987 (NBER Working Paper No. 1687)

927. "Tax Policy and Stock Prices," by Thomas Downs and Patric H. Hendershott, 1987 (NBER Working Paper No. 2094)

928. "Taxation of Investment and Savings in a World Economy," by Roger H. Gordon, 1986 (NBER Working Paper No. 1723)

929. "Uncertain Parameter Values and the Choice among Policy Options," by Don Fullerton and Andrew B. Lyon, 1986 (NBER Working Paper No. 1111)

930. "Capital Allocation in Multidivision Firms: Hurdle Rates versus Budgets," by Robert A. Taggart, Jr., 1987 (NBER Working Paper No. 1213)

931. "Aspects of Investor Behavior under Risk," by Benjamin J. Friedman and V. Vance Roley, 1987 (NBER Working Paper No. 1611)

932. "Public Debt Guarantees and Private Capital Flight," by Jonathan Eaton, 1987 (NBER Working Paper No. 2172)

933. "Tax Evasion and Capital Gains Taxation," by James M. Poterba, 1987 (NBER Working Paper No. 2119)

934. "Public Policy Implications of Declining Old-Age Mortality," by James M. Poterba and Lawrence H. Summers, 1987

935. "Regression versus Volatility Tests of the Efficiency of Foreign Exchange Markets," by Jeffrey A. Frankel and James H. Stock, 1987 (NBER Working Paper No. 1105)

936. "Tax Structure and Public Sector Growth," by Daniel R. Feenberg and Harvey S. Rosen, 1987 (NBER Working Paper No. 2020)

937. "Adjusting Output and Productivity Indexes for Changes in the Terms of Trade," by Catherine G. Morrison and W. Erwin Diewert, 1987 (NBER Working Paper No. 1848)

938. "The New Protectionism: A Response to Shifts in National Economic Power," by Robert E. Baldwin, 1986 (NBER Working Paper No. 1823)

939. "Fixed Price versus Spot Price Contracts: A Study in Risk Allocation," by A. Mitchell Polinsky, 1987 (NBER Working Paper No. 1817)

940. "Stopping Hyperinflation: Lessons from the German Inflation Experience of the 1920s," by Rudiger Dornbusch, 1986 (NBER Working Paper No. 1675)

941. "The Order of Liberalization of the Current and Capital Accounts of the Balance of Payments," by Sebastian Edwards, 1986 (NBER Working Paper No. 1507)

942. "Personal Taxation, Pension Wealth, and Portfolio Composition," by R. Glenn Hubbard, 1985 (NBER Working Paper No. 1361)

943. "Liquidity Constraints, Fiscal Policy, and Consumption," by R. Glenn Hubbard and Kenneth L. Judd, 1986

944. "The Farm Debt Crisis and Public Policy," by Charles R. Calomiris, R. Glenn Hubbard, and James H. Stock, 1986

945. "Dissaving after Retirement: Testing the Pure Life-Cycle Hypothesis," by B. Douglas Bernheim, 1987 (NBER Working Paper No. 1411)

946. "Does the Estate Tax Raise Revenue?" by B. Douglas Bernheim, 1987 (NBER Working Paper No. 2087)

947. "The Development of Keynesian Macroeconomics," by Bennett T. McCallum, 1987 (NBER Working Paper No. 2156)

948. "An Examination of Aggregate Price Uncertainty in Four Countries and Some Implications for Real Output," by Richard T. Froyen and Roger N. Waud, 1987 (NBER Working Paper No. 1460)

949. "Assistance to the Poor in a Federal System," by Charles C. Brown and Wallace E. Oates, 1987 (NBER Working Paper No. 1715)

950. "Birth Outcome Production Functions in the United States," by Hope Corman, Theodore J. Joyce, and Michael Grossman, 1987 (NBER Working Paper No. 1729)

951. "Drinking Age Laws and Highway Mortality Rates: Cause and Effect," by Michael Grossman and Henry Saffer, 1987 (NBER Working Paper No. 1982)

952. "Notes on the Tax Treatment of Structures," by Roger H. Gordon, James R. Hines, Jr., and Lawrence H. Summers, 1987 (NBER Working Paper No. 1896)

## Technical Papers Series

The following study in the NBER Technical Working Papers series is 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. Prepayment is required for all orders under $10.00.

63. "Spurious Trend and Cycle in the State Space Decomposition of a Time Series with a Unit Root," by Charles R. Nelson, November 1987 (JEL Nos. 210, 220)

# Bureau Books

The following volumes may be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for *all* NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

## Mergers and Acquisitions

*Mergers and Acquisitions,* edited by Alan J. Auerbach, is available from the University of Chicago Press at a cost of $17.95. This nontechnical volume of papers presented at an NBER conference in October 1986 surveys some of the issues created by the recent boom in takeovers. For example, one paper asks whether mergers have led to financial instability. Another considers how mergers affect the interests of stockholders. A third study analyzes the role of taxes in mergers and acquisitions. There is also an in-depth analysis of the implications that this wave of activity has for industrial structure and concentration.

This book should appeal to a wide audience and is must reading for anyone interested in corporate finance and recent trends in business.

Auerbach is a professor of economics at the University of Pennsylvania and an NBER research associate.

## Pensions in the U.S. Economy

*Pensions in the U.S. Economy,* edited by Zvi Bodie, John B. Shoven, and David A. Wise, is available from the University of Chicago Press for $28.00. This fourth in a series of NBER books on pensions should interest both economists and policymakers who are concerned with the economic status of the elderly.

Four papers focus on retirement saving, both by individuals and by corporations through their funding of

pension plans. One paper finds that Individual Retirement Accounts have increased personal saving. Another concludes that the rise in stock prices since 1982 has decreased corporate contributions to pension plans. Other studies examine why individuals do not purchase more annuities, and why a large fraction of the elderly remain poor despite gains in income for the elderly population as a whole.

The final two papers analyze pension plans. Specifically, one considers the relative merits of defined-contribution versus defined-benefit plans; it includes new data that could be used in designing plans that would incorporate the best features of both. The second paper evaluates how various characteristics of pensions influence job turnover.

Bodie is a professor of finance at Boston University. Shoven is a professor of economics at Stanford University, and Wise is a professor of political economy at Harvard's Kennedy School of Government. All three are research associates of the National Bureau of Economic Research.

# Current Working Papers

Individual copies of NBER Working Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies of the 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.

*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 1987 are presented below. For previous Working Papers, see past issues of the *NBER Reporter*. The 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. Working Papers are not reviewed by the Board of Directors of NBER.

## Energy, Obsolescence, and the Productivity Slowdown

**Charles R. Hulten, James W. Robertson,** and **Frank C. Wykoff**
Working Paper No. 2404
October 1987

The growth rate of output per worker in the United States declined sharply during the 1970s. A leading explanation of this phenomenon is that the dramatic rise in energy prices during the 1970s caused a significant portion of the U.S. capital stock to become obsolete. This led to a decline in effective capital input which, in turn, caused a reduction in the growth rate of output per worker.

This paper examines a key prediction of this hypothesis. If there is a significant link between energy and capital obsolescence, it should be revealed in the market price of used capital: if rising energy costs did in fact render older, energy-inefficient capital obsolete, then prospective buyers should have reduced the price that they were willing to pay for that capital. An examination of the market for used capital before and after the energy price shocks thus should reveal the presence and magnitude of the obsolescence effect.

We have carried out this examination for four types of used machine tools and five types of construction equipment. We did not find a general reduction in the price of used equipment after the energy price shocks. Indeed, the price of used construction equipment—the more energy-intensive of our two types of capital—tended to increase after 1973. Thus, our data do not support the obsolescence explanation of the productivity slowdown.

## The Political Economy of Fiscal Policy

**Daniel E. Ingberman** and **Robert P. Inman**
Working Paper No. 2405
October 1987

If there has been a dominant trend in the evolution of the modern industrial societies of this century, it has been the growing importance of government in the allocation of social resources. It is important that we appreciate the fundamentally political nature of the formation of government economic policy.

This paper reviews and assesses our present understanding of how the political system might shape a

nation's fiscal policy. Our approach is eclectic, drawing from both economics and from political science, and is decidedly microanalytic in its orientation. From economics we adopt the perspective of utility-maximizing agents and the analytics of trade, agreement, and market failure. From political science we learn just how and when these individual agents might act collectively to provide public goods, redistribute income, or issue government debt. Together the microanalytics of economics and political science form the core theory of the new political economy and provide a framework for understanding the emergence, and the performance of governments. There is no more important test for the new discipline than providing a compelling explanation for the formation of fiscal policy in democratic societies.

## Transaction Costs and Internal Labor Markets

**Sherwin Rosen**
Working Paper No. 2407
October 1987

This paper applies the concept of transactions costs used by Coase in *The Nature of the Firm* to the internal labor market of an organization. Under joint production, the number of transportation-specific prices necessary to centralize labor allocations rises geometrically with the size of the work force. Complexity of calculation and costs of implementation constrain the possibilities for internal decentralization through a price mechanism and substitute instead a more authoritarian system of allocation. These same issues of complexity and implementation costs limit the usefulness of agency theory as a conceptual framework for this problem. The analysis suggests that an internal labor market must be viewed in the more comprehensive framework of a personal management system.

## Economic Incentives and Political Institutions: Spending and Voting in School Budget Referenda

**Thomas Romer, Howard Rosenthal** and **Vincent G. Munley**
Working Paper No. 2406
October 1987

Allocation of resources in the local public sector involves economic and political forces. Spending for elementary and secondary education is a major area of public expenditure. In many states, the bulk of this spending is subject to referendum. In addition, grants-in-aid from state governments to local school districts are an important component of the districts' revenues.

This paper first characterizes local spending when the state aid structure is closed-end matching grants. Under this structure, local tax price is endogenous, since the amount of state subsidy depends on the district's spending choice. We also link spending proposals to referendum outcomes. In this way, our model makes use of voting data to shed light on the extent to which referendums constrain spending. The empirical setting is public school budget referendums in 544 New York school districts for the 1975-6 school year. Our econometric results and simulations reveal considerable sensitivity of spending to the form of the grant structure, as well as to the referendum requirement. In addition, large school districts appear to behave more like budget-maximizers than do small districts, where proposals appear to be more in line with the demands of median voters.

## United States-Japan Economic Relations

**Rachel McCulloch**
Working Paper No. 2408
October 1987

The bilateral relationship with Japan now dominates American thinking on the benefits and costs of foreign trade. This paper reevaluates the past and future course of U.S.-Japan economic relations. It identifies six distinct aspects of the relationship that may underlie the continuing friction: bilateral imbalance on merchandise; capital flows from Japan to the United States; the yen/dollar exchange rate; sectorial trade distortions; Japan's technological catch-up; and societal differences. For each source of conflict, I assess the main causes and potential remedies.

Several important conclusions emerge from the analysis. First, although the bilateral trade and capital account imbalances were produced primarily by macroeconomic factors and therefore can be viewed as "temporary" rather than long-term developments, elimination of the imbalances without serious damage may be difficult to achieve. In terms of sectorial adjustments, the U.S.-Japan relationship is entering a new phase as the two nations grow more similar in terms of technology base, abundance of capital and skilled labor, and per capita income. Two-way trade in technology

and in technology-based services will become increasingly important, while both nations will cope with similar problems of adjustment to pressure from a new tier of competitors in Asia and elsewhere. As the aggregate imbalances diminish, sectorial trade conflict will be concentrated on the two ends of the technology spectruum, with issues raised both by conflicting approaches to the phasing out of uncompetitive industries and by the nurturing of new technology-based industries.

## Prospects for Liberalizing the International Trading System

**Anne O. Krueger**
Working Paper No. 2409
October 1987

This paper analyzes the equilibrium degree of protection as the outome of the interaction of demands for protection and the demand for a liberal international trading order. It then assesses the current balance. On one hand, the nature of technical progress, the institution of the Uruguay Round, the mounting costs of agricultural protection, and the increasingly high costs of protection as the world economy integrates all conduce toward a more liberal trading order. Demands for protection will intensify to the extent that growth decelerates, that trade negotiators fail to find mechanisms to deal with nontariff barriers, and that the United States fails to reassume the leadership role that it had taken earlier.

## Investment, Openness, and Country Risk

**Joshua Aizenman**
Working Paper No. 2410
October 1987

This study draws attention to the linkages between country risk and the openness of an economy, and demonstrates that in the long run the openness of the economy is endogenously determined by the interaction between endowments and policies. The presence of country risk poses a problem for the smooth operation of international credit markets: the ex ante, first-best policy is for countries to precommit themselves to no-default policies. However, such a commitment may not be credible because it may not be the optimal ex post policy. This suggests a special role for policies that lead toward investment in openness as a way to increase the credibility of a no-default commitment. The paper studies the optimal implementation of these policies. It demonstrates that a rise in country risk is associated with more frequent defaults and consequently with a lower level of investment. The resultant drop in investment is larger in activities with greater reliance on international trade. The presence of country risk introduces a distortion, calling for financial policies in the form of a tax on consumption borrowing and a different tax on investment borrowing. The optimal investment borrowing tax balances two effects: the aggregate indebtedness and the openness effects. The stronger the openness effect, the lower the optimal investment borrowing tax. If this effect dominates, the optimal policy is an investment subsidy. I also study the nature of country risk in the presence of equity finance. I demonstrate that swapping nominal debt with equities may have useful consequences for reducing country risk, but it cannot eliminate the fundamental problems associated with international credit.

## The Marginal Value of Social Security

**Michael D. Hurd**
Working Paper No. 2411
October 1987

If annuities such as Social Security are not chosen freely, then the consumption path typically cannot be determined independently of the path of annuities. This constraint reduces the value of the annuity from the point of view of the annuitant. I measure the value of the annuity by the marginal rate of substitution (MRS), which is the amount of bequeathable wealth that will substitute for a dollar of annuity wealth. In the analytical section of the paper, I show that the MRS increases as bequeathable wealth increases; in that sense, the wealthy benefit more from Social Security than the poor do. In the empirical section, I estimate the MRS for a sample of retired single elderly. The MRS varies considerably from individual to individual because of differences in the mix of bequeathable wealth and annuities. For the parameter values that best fit the data, a substantial fraction of the sample has more Social Security than it would like in that it would be willing to trade, at the margin, a claim to Social Security for an increase in bequeathable wealth.

## The Equilibrium and Optimal Timing of Price Changes

**Laurence Ball** and **David Romer**
Working Paper No. 2412
October 1987

This paper studies the welfare properties of the equilibrium timing of price changes. Staggered price-setting has the advantage of permitting rapid adjustment to firm-specific shocks but the disadvantage of causing inertia in the price level and therefore increasing aggregate fluctuations. Because each firm ignores its contribution to inertia, staggering can be a stable equilibrium even if it is highly inefficient. In addition, there can be multiple equilibriums in the timing of price changes. Indeed, whenever there is an inefficient staggered equilibrium, there is also an efficient equilibrium with synchronized price-setting.

## Seigniorage, Operating Rules, and the High-Inflation Trap

**Michael Bruno** and **Stanley Fischer**
Working Paper No. 2413
October 1987
JEL No. 310

A given amount of seigniorage revenue can be collected at either a high or a low rate of inflation. Thus, there may be two equilibriums when a government finances its deficit by printing money. This implies that an economy may be stuck in a high-inflation equilibrium when it could be at a lower inflation rate with the same fiscal policy.

We show that under rational expectations the high-inflation equilibrium is stable and the low-inflation equilibrium unstable. Under adaptive expectations or lagged adjustment of money balances with rational expectations, it may be the low-inflation equilibrium that is stable.

Extending the model to allow for financing of deficits with bonds as well as money, we show that one of the equilibriums disappears if the government sets a nominal anchor for the economy, for instance by fixing the growth rate of money. The dual equilibriums and their stability characteristics remain if the government fixes the real interest rate. The existence of dual equilibriums is thus a result of the operating rules that the government chooses for monetary and fiscal policy.

## Worker Knowledge of Pension Provisions

**Olivia S. Mitchell**
Working Paper No. 2414
October 1987

This paper evaluates the quality of workers' information regarding pension offerings. Using both administrative records and worker reports of pension provisions, I find that misinformation and a lack of information are widespread. Unionized employees, higher-income workers, workers in large firms, the better educated, and those with greater seniority are better informed about their pensions. There are also demographic differences: nonwhites have less pension knowledge than whites do, but women are better informed than men are.

Myopia about pension incentive structures is troubling since workers may save or consume less than is optimal, change jobs, or retire earlier than they would have if they had better pension information. The prevalence of missing data should also be troubling to empirical analysts of pensions who use datasets that report workers' assessments of pension provisions.

## The Importance of Gifts and Inheritances among the Affluent

**Michael D. Hurd** and **B. Gabriella Mundaca**
Working Paper No. 2415
October 1987

Using data from the 1964 Survey of the Economic Behavior of the Affluent, we estimate directly the fraction of household assets that come from inheritances and the fraction that come from gifts. These data are well suited for this calculation because the survey is heavily weighted toward households with high incomes, and because the respondents were asked directly about the sources of their wealth. We estimate that 15–20 percent of household wealth came from inheritances and 5–10 percent from gifts. Even in households with very high incomes, very few people say that a large fraction of their assets were inherited or were given to them. According to the responses in this survey, it is not creditable that as much as 50 percent of household assets came from gifts and inheritances. Using data from the 1983 Survey of Consumer Finances with high-income supplement, we roughly confirm the 1964 results, although the 1983 data are much less comprehensive than the 1954 data are.

## Commitment and the Modern Union: Assessing the Link between Premarital Cohabitation and Subsequent Marital Stability

**Neil G. Bennett, Ann K. Blanc,** and **David E. Bloom**
Working Paper No. 2416
October 1987
JEL No. 841

In recent years, the incidence of premarital cohabitation has increased dramatically in many countries of Western Europe and in the United States. As cohabitation becomes a more common experience, it is increasingly important to understand the links between it and other steps in the process of family formation and dissolution. We focus on the relationship between premarital cohabitation and subsequent marital stability, and use a hazards model approach to analyze data from the 1981 Women in Sweden survey.

Our results indicate that women who cohabit premaritally have almost 80 percent higher marital dissolution rates than those who do not. Women who cohabit for more than three years before marrying have over 50 percent higher marital dissolution rates than those who cohabit for shorter periods. Finally, among all couples whose marriages have remained intact for eight years, dissolution rates after that time are identical. In addition, we provide evidence that strongly suggests a weaker commitment to the institution of marriage on the part of those who cohabit premaritally.

## Trade in Nominal Assets: Monetary Policy, and Price Level and Exchange Rate Risk

**Lars E. O. Svensson**
Working Paper No. 2417
October 1987
JEL Nos. 313, 411, 431, 432, 441

In NBER Working Paper No. 2403, "Trade in Risky Assets," I analyzed the pattern of international trade in risky real assets between barter economies, relying on the law of comparative advantage and using autarky asset price differences to predict the pattern of asset trade. In this paper I extend the analysis to international trade in nominal assets (assets with returns paid in currencies) between monetary economies. The risk characteristics of real returns on nominal assets depend on price level and exchange rate risk, and therefore on monetary policy. I examine how different combinations of monetary policies and exchange rate regimes affect nominal assets' return risk characteristics, their autarky prices, and hence their trade pattern, when countries differ with respect to their outputs or their attitudes toward risk. When world asset markets are incomplete, different monetary policies and exchange rate regimes have dramatic effects on risk characteristics of home and foreign currency bonds and on the trade pattern in these assets, as well as on aggregate capital and current accounts.

## The Costs of Conflict Resolution and Financial Distress: Evidence from the Texaco-Pennzoil Litigation

**David M. Cutler** and **Lawrence H. Summers**
Working Paper No. 2418
October 1987

This paper demonstrates that the ongoing dispute between Texaco and Pennzoil over the Getty Oil takeover has reduced the combined wealth of the claimants of the two companies by about $2 billion. Pennzoil's shareholders have gained less than one-third as much as Texaco's shareholders have lost. This loss in the combined value of the two companies far exceeds estimates of the direct costs of carrying on the litigation. It may reflect the disruption in the operations of Texaco caused by the large and uncertain debt burden to Pennzoil.

## Have Productivity Levels Converged? Productivity Growth, Convergence, and Welfare in the Very Long Run

**J. Bradford DeLong**
Working Paper No. 2419
October 1987

Economists believe that, because technology is a public good, national productivity levels should "converge." William Baumol (1986) argues that convergence can be seen over the past century if one focuses on relatively rich nations that were socially capable of taking advantage of machine technology. Using Maddison's (1982) data, he finds that the productivity levels of 16 such nations have converged since 1870.

But convergence in Baumol's sample is guaranteed

by construction. Maddison's study by design is of nations that have developed successfully and have high incomes today—that is, nations that have converged. Baumol's data thus are contaminated by sample selection bias and tell us little about whether those nations that a century ago had the social capability for rapid industrialization have converged.

Using an unbiased sample of nations that appeared likely to converge ex ante, and correcting econometrically for inevitable errors in independent variables from 1870, I find that rates of growth since 1870 are not strongly related to levels of income in 1870. The forces for convergence were counterbalanced by the forces for divergence, even for those nations that should have converged most easily.

One good ex ante predictor of a nation's rate of growth since 1870 is the dominant religion. Holding per capita income constant in 1870, nations that had Protestant religious establishments in 1870 had per capita incomes in 1979 that were more than one-third higher than nations that had Catholic establishments in 1870. This suggests that Max Weber [1905] (1958) may have something to teach us about the forces that have determined growth in the industrial West over the past century.

## Bank Portfolio Choice with Private Information about Loan Quality: Theory and Implications for Regulation

**Deborah Lucas** and **Robert L. McDonald**
Working Paper No. 2421
October 1987
JEL No. 312

This paper models bank asset choice when shareholders know more about loan quality than outsiders do. Because of this informational asymmetry, the price of loans in the secondary market is the price for poor-quality loans. Banks want to hold marketable securities in order to avoid liquidating good-quality loans at the "lemons" price, but also have a countervailing desire to hold risky loans in order to maximize the value of deposit insurance. In this context, portfolio composition and bank safety are examined as functions of the market distribution of loan quality and the distribution of deposits. The model suggests that off-balance-sheet commitments have little effect on bankruptcy risk and induce banks to hold more securities. We also show that an increase in the bank equity requirement will increase bank safety unambiguously in the long run. In the short run, banks are unambiguously riskier on balance sheet, although the effect on bank safety is ambiguous.

## Import Competition and the Stock Market Return to Capital

**Gene M. Grossman** and **James A. Levinsohn**
Working Paper No. 2420
October 1987
JEL Nos. 411, 521

We measure the responsiveness of returns to capital invested in six U.S. industries to shocks to the prices of competing import goods. Recognizing that most capital services are not traded on spot rental markets, we treat the intersectorial mobility of capital as the outgrowth of investment behavior. Then the return to capital is realized as an asset return to equity holders. We model expected returns by the capital asset pricing model and relate "excess" returns in a period of unanticipated shocks to the variables that affect current and future profits. We find that positive shocks to import prices cause higher-than-normal stock market returns in all six industries. The magnitudes of the responses are consistent with the hypothesis that capital is highly sector-specific in five of these industries.

## Bank Financing and Investment Decisions with Asymmetric Information

**Deborah Lucas** and **Robert L. McDonald**
Working Paper No. 2422
October 1987
JEL Nos. 312, 520

Banks know more about the quality of their assets than outside investors do. This asymmetry of information can distort investment decisions if the bank must raise funds from uninformed outsiders and sell assets at a "lemons discount." Using a three-period equilibrium model, we examine the effect of asymmetric information about loan quality on the asset and liability decisions of banks and on the market valuation of bank liabilities. The existence of a precautionary demand for T-bills against future liquidity needs depends both on the regulatory environment and on the informational structure. If banks are identical ex ante, then they prefer to issue risky debt to fund a deposit outflow rather than hold T-bills, ex ante. However, if banks have partial knowledge of loan quality, and if their asset choice is observable, they may hold T-bills to signal their quality, enabling them to issue risky debt at a lower interest rate.

## The Learning Curve and Optimal Production under Uncertainty

**Saman Majd** and **Robert S. Pindyck**
Working Paper No. 2423
October 1987
JEL Nos. 210, 520, 600

This paper examines the implications of the learning curve in a world of uncertainty. We consider a competitive firm whose costs decline with cumulative output. Because the price of the firm's output evolves stochastically, future production and cumulative output are unknown and are contingent on future prices and costs. We derive an optimal decision rule that maximizes the firm's market value: produce when price exceeds a critical level, which is a declining function of cumulative output. We show how the shadow value of cumulative production, as well as the total value of the firm, depend on the volatility of price and other parameters. Over the relevant range of prices, uncertainty reduces the shadow value of cumulative production and therefore increases the critical price required for the firm to begin producing.

## Adjustment in the World Economy

**Paul R. Krugman**
Working Paper No. 2424
October 1987
JEL No. 431

There is a widespread view that imbalances in world payments can be remedied through increased demand in surplus countries and reduced demand in deficit countries without any need for changes in the real exchange rate. In fact, shifts in demand and adjustment of the real exchange rate are necessary complements, not substitutes.

The essential reason for this complementarity is that a much higher fraction of a marginal dollar of U.S. than of foreign spending falls on U.S. output. As a result, a redistribution of world spending away from the United States leads to an excess supply of U.S. goods unless accompanied by a decline in their relative price. Although some economists believe that the integration of world capital markets somehow eliminates this problem, this is a fallacy that confuses accounting identities with behavior.

The paper also addresses a number of related issues, such as the role of budget deficits in determining domestic demand and the effectiveness of changes in nominal exchange rates in producing real depreciation.

## Inventories and the Propagation of Sectorial Shocks

**Russell Cooper** and **John C. Haltiwanger**
Working Paper No. 2425
November 1987
JEL Nos. 023, 131

This paper examines the dynamic properties of an imperfectly competitive economy with inventory holdings. In particular, we focus on the serial correlation in aggregate output and employment produced by holding inventories in one sector of the economy. We also consider the co-movement between sectors of an economy over the business cycle that results from demand linkages. We contrast this model with a simple, competitive model of the real business cycle with inventories. We find that the predictions of these models with regard to the co-movement of employment may differ. Based on this, we present empirical evidence on the co-movement of employment over the business cycle consistent with the predictions of the model of imperfect competition with inventory holdings and demand linkages.

## Pensions, Efficiency Wages, and Job Mobility

**Alan L. Gustman** and **Thomas L. Steinmeier**
Working Paper No. 2426
November 1987
JEL No. 820

This paper finds that compensation premiums, not pension backloading, are responsible for the low mobility rates away from jobs with pensions. Compensation premiums, which may represent efficiency wages, are defined as the difference in compensation between the current job and the best alternative job; such premiums are observed only for job changers. We calculate the amount of pension backloading, using data provided by employers to the Survey of Consumer Finances; that greatly improves the precision of measurement over past efforts. Our finding has important implications for labor market analysis and for policies on pension regulation.

## Federal Deductibility and Local Property Tax Rates

**Douglas Holtz-Eakin** and **Harvey S. Rosen**
Working Paper No. 2427
November 1987
JEL No. 320

In current discussions of tax reform in the United States, there is considerable controversy about the effects of allowing individuals to deduct state and local taxes from their federal taxable income. Recent econometric work has suggested that federal deductibility of state and local taxes raised their proportion, especially the share of property taxes, in local budgets. This paper supports these earlier findings. We show that deductibility leads to higher local property tax revenues by increasing the *rate* of local property taxation. Specifically, we find that if deductibility were eliminated, the mean property tax rate in our sample of 82 communities would fall by $7.15 per thousand dollars of assessed property, or 21.1 percent of the mean tax rate.

## Equilibrium Political Budget Cycles

**Kenneth Rogoff**
Working Paper No. 2428
November 1987
JEL Nos. 023, 130, 320

Prior to elections, governments (at all levels) frequently go on a consumption binge. They cut taxes, raise transfers, and distort spending toward highly visible items. The "political business cycle" (better thought of as "the political budget cycle") has been examined intensively, at least in the case of national elections. A number of proposals have been advanced for mitigating electoral cycles in fiscal policy.

This paper is the first to provide a fully specified equilibrium framework for analyzing such proposals. A political budget cycle arises here via a multidimensional signaling process, in which incumbent leaders try to convince voters that recently they have been doing an excellent job in administering the government. Efforts to mitigate the cycle easily can prove counterproductive, either by impeding the transmission of information or by inducing politicians to select more costly ways of signaling. The model also indicates new directions for empirical research.

## Risk, Uncertainty, and Exchange Rates

**Robert J. Hodrick**
Working Paper No. 2429
November 1987
JEL No. 430

This paper explores a new direction for empirical models of exchange rate determination. The motivation arises from two well-documented facts: the failure of log-linear empirical exchange rate models of the 1970s and the variability of risk premiums in the forward market. Rational maximizing models of economic behavior imply that changes in the conditional variances of exogenous processes, such as future monetary policies, future government spending, and future rates of income growth, can have a significant effect on risk premiums in the foreign exchange market and can induce conditional volatility of spot exchange rates. I examine theoretically how changes in these exogenous conditional variances affect the level of the current exchange rate, and I attempt to quantify the extent to which this channel explains exchange rate volatility using autoregressive conditional heteroskedastic models.

## Tax Neutrality and Intangible Capital

**Don Fullerton** and **Andrew B. Lyon**
Working Paper No. 2430
November 1987
JEL Nos. 323, 630

Many studies measure capital stocks and effective tax rates for different industries, but they consider only tangible assets such as equipment, structures, inventories, and land. Some of these studies also have estimated that the welfare cost of tax differences among these assets under prior law is about $10 billion per year, or 13 percent of all corporate income tax revenue. Since the investment tax credit was available only for equipment, its repeal raises the effective rate of taxation of equipment toward the rate on other assets and virtually eliminates this welfare cost.

However, firms also own intangible assets such as trademarks, copyrights, patents, a good reputation, or general production expertise. This paper provides alternative measures of the intangible capital stock, and it investigates implications for distortions caused by taxes. The existence of intangible capital markedly

alters welfare cost calculations. Investment in advertising and R and D are expensed, so the effective rate of tax on these assets is less than the rate on equipment under prior law. With large differences among these assets and other tangible assets, we find that the welfare cost measure under prior law increases to $13 billion per year. Repeal of the investment credit taxes equipment more like other tangible assets but *less* like intangible assets. The welfare cost still falls, to about $7 billion per year, but it is no longer "virtually eliminated." With additional sources of intangible capital, credit repeal actually could increase welfare costs. Finally, the Tax Reform Act of 1986 not only repeals the investment tax credit but also reduces rates. Efficiency always increases in this model because the taxation of tangible assets is reduced toward the level of tax on intangible assets.

## The Equilibrium and Optimal Timing of Price Changes

**Laurence Ball** and **David Romer**
Working Paper No. 2432
November 1987

This paper studies the welfare properties of the equilibrium timing of price changes. Staggered price-setting has the advantage of permitting rapid adjustment to firm-specific shocks but the disadvantage of causing price level inertia and, therefore, increasing aggregate fluctuations. Because each firm ignores its contribution to inertia, staggering can be a stable equilibrium even if it is highly efficient. In addition, there can be multiple equilibriums in the timing of price changes. Indeed, whenever there is an inefficient staggered equilibrium, there is also an efficient equilibrium with synchronized price-setting.

## Credible Commitment and Exchange Rate Stability: Canada's Interwar Experience

**Michael D. Bordo** and **Angela Redish**
Working Paper No. 2431
November 1987
JEL Nos. 311, 431, 042

In January 1929 the Canadian government suspended gold exports and began a floating exchange rate regime that endured until the onset of World War II. In sharp contrast with the experience of other countries that left the gold standard, Canada had deflation and declining economic activity until 1933.

This paper examines the determinants of the Canadian exchange rate in the 1930s and answers the question of why the Canadian dollar did not depreciate in the early 1930s despite Canada's de facto departure from the gold standard. We show first that the government made a clear commitment to maintain a contractionary monetary policy. It did so because it believed that monetary expansion would increase the value of external obligations without reducing the value of domestic obligations; it also believed that even if all contractual obligations were met, Canada would lose her reputation as a responsible debtor. Second, we argue that the public viewed the government's commitment as credible. The credible commitment dominated market agents' expectations of the evolution of the exchange rate.

## The Effect of Mental Distress on Income: Results from a Community Survey

**Richard G. Frank** and **Paul Gertler**
Working Paper No. 2433
November 1987
JEL No. 913

We employ a unique dataset from a community-based survey to assess the effect of mental distress on earnings. The main advantage of our data is that the mental health status of all subjects in the study was measured in detail. Our population-based measure of mental distress therefore does not rely on a patient having had contact with the health care system and obtaining a diagnosis from a provider. The use of diagnosis-based measures may introduce measurement error bias into the estimates.

Our results show that the presence of mental distress reduces earnings by approximately 21 percent to 33 percent. To assess the magnitude of any measurement error bias, we present estimates of models that use both population-wide and diagnosis-based measures of mental health. The estimated impact of mental illness on earning is only 9 percent lower using the diagnosis-based measure. We conclude that little bias is introduced by using the diagnosis-based measure.

## Macroeconomic Effects of Price Control: The Role of Market Structure

**Elhanan Helpman**
Working Paper No. 2434
November 1987
JEL No. 130

Price controls were part of Israel's stabilization program of July 1985. Some results of the program seem to be inconsistent with competitive macroeconomic models; these results seem to be consistent with an economy that has an oligopolistic market structure. This paper explores the effects of market structure on macroeconomic performance in the presence and absence of price control.

## The Real Exchange Rate and Employment in U.S. Manufacturing: State and Regional Results

**William H. Branson** and **James P. Love**
Working Paper No. 2435
November 1987
JEL Nos. 400, 820

In a series of earlier papers we examined the impact of exchange rate movements on employment and output in the manufacturing sector, disaggregated by industry sector and by production and nonproduction workers. In this paper we examine the impact of exchange rate movements on manufacturing employment, disaggregated geographically, using census divisions, regions, states, and Standard Metropolitan Statistical Areas (SMSAs) as the unit of analysis. We first present empirical estimates of employment changes for the four census regions, the nine census divisions, and the 50 states plus the District of Columbia. Then we estimate that movements in the real exchange rate led to the loss of about 1 million manufacturing jobs over this period for the country as a whole.

We go on to examine manufacturing employment in New York State in greater detail and report that exchange rate movements had a much larger impact in the areas outside New York City than within the metropolitan area. This result is consistent with earlier work that found that employment in management or research is not as sensitive to exchange rate movements as employment in production processes is.

We follow the New York results with an examination of manufacturing employment in five southern states with large rural populations. Some policymakers have expressed a concern that manufacturing employment in rural areas suffered more than in urban areas during the period of the dollar appreciation. We find that *within* these five states, the impact of the exchange rate on manufacturing employment in the non-SMSAs was the same or less than was the case for employment within SMSAs.

Finally, we use a multivariate model to explore why manufacturing employment is more sensitive to exchange rate movements in some states than in others. Factors that are associated with greater sensitivity of manufacturing employment to exchange rate movements are: the percentage of the population living outside of SMSAs; the level of production worker wages; and crude oil production. Factors that are associated with less sensitivity of manufacturing employment to exchange rate movements include the percentage of the population with four or more years of college, or per capita expenditures on public secondary schools.

## Permanent Income, Current Income, and Consumption

**John Y. Campbell** and **N. Gregory Mankiw**
Working Paper No. 2436
November 1987
JEL No. 131

This paper reexamines the consistency of the permanent-income hypothesis with aggregate, postwar U.S. data. The permanent-income hypothesis is nested within a more general model in which a fraction of income accrues to individuals who consume their current income rather than their permanent income. This fraction is estimated to be 40 or 50 percent, indicating a substantial departure from the permanent-income hypothesis. This finding is robust to various statistical problems that have plagued previous work, such as time aggregation. It cannot be explained easily by appealing to changes in the real interest rate or to nonseparabilities in the utility function.

## Trade Deficits in the Long Run

**Barry J. Eichengreen**
Working Paper No. 2437
November 1987
JEL Nos. 400, 410, 430

This paper provides a historical perspective on the recent behavior of the U.S. trade deficit, which has now

reached an unprecedented level. The source of the deficit is not changes in market structure, affecting the speed with which quantities respond to prices, but rather the policy environment, especially the monetary-fiscal policy mix. While other industrial countries have run comparable merchandise trade deficits at various points in the past, these countries either financed their deficits out of interest earnings on prior foreign investments or the large-scale export of services, or they used the debt to finance investment in infrastructure and to expand their capacity to export. Neither of these scenarios parallels the current U.S. experience.

How easily can the trade deficit be eliminated? Typically, the rapid reduction of deficits has been achieved through the reduction of imports; this entails restraints on aggregate demand, resulting in recession. Trade deficits have been reduced most quickly and at the lowest cost when at least one of two conditions prevails: a favorable shock to the terms of trade, or a reallocation of resources toward investment in export-oriented sectors. The first of these conditions is largely beyond the authorities' control, while the second must be initiated well in advance. Barring a fortuitous terms-of-trade shock, rapidly eliminating the U.S. trade deficit is not likely.

## The Farm Labor Force by Region, 1820-1860: Revised Estimates and Implications for Growth

**Thomas Weiss**
Working Paper No. 2438
November 1987
JEL Nos. 042, 813

This paper sets forth new estimates of the farm labor force in 1820-60 for the United States as a whole and its major geographic regions. At the national level, the new figures are noticeably different from the previous estimates. In particular, the new estimates of the 1820 farm labor force are about 8 percent lower, while they are 7-10 percent higher for 1840, 1850, and 1860. As a consequence, the farm work force grew more rapidly than was previously believed, while farm productivity and per capita income grew more slowly. The impact of the revisions, of course, varied by subperiod.

The new figures also alter our picture of variations in regional economic performance, more in some regions than in others. In particular, the pace and timing of the shift out of farming in New England is substantially different from what we had believed.

The paper also discusses the reasons for the discrepancies between the new and the old series, and provides some assessment of the new evidence.

## Pension Wealth, Age-Wealth Profiles, and the Distribution of Net Worth

**Ann McDermed, Robert L. Clark,** and **Steven G. Allen**
Working Paper No. 2439
November 1987

This study estimates the magnitude of pension wealth and compares it to net worth for households in the 1983 Survey of Consumer Finance (SCF). The SCF contains the first dataset to provide detailed information on both household finances and pension characteristics. The pension information is provided by the employer, so that it is much more detailed and likely to be more accurate than the pension data used in previous studies.

We estimate pension wealth under two sets of assumptions. Using the projected earnings approach, mean pension wealth is $98,291. This represents 43 percent of mean net worth for households with pensions. Under the legal method of calculating pension wealth, mean pension wealth is $47,541. That represents 26 percent of mean net worth for households with pensions. Both estimates are much larger than those obtained in earlier studies.

This paper also examines how estimates of inequality in the wealth distribution change when pension wealth is added to household balance sheets. Using a variety of methods and assumptions, the distribution becomes more nearly equal when the definition of wealth is expanded to include pension assets.

## Changes in the Cyclical Behavior of Individual Production Series

**Christina D. Romer**
Working Paper No. 2440
November 1987

This paper uses simple time-series techniques to analyze changes in the short-run behavior of 38 physical production series for 1889-1984. The main finding is that fluctuations in these output series in 1889-1914 and 1947-84 are very similar, while those in 1922-39 are anomalous. Relative to the prewar era, the postwar era exhibits only a slight damping of fluctuations and no increase in the persistence of short-run movements. At the same time, the correlation between the growth rates of the 38 goods is very low in both the prewar and postwar eras and has declined slightly over time.

## Portfolio Diversification, Real Interest Rates, and the Balance of Payments

**Carol L. Osler**
Working Paper No. 2441
November 1987
JEL No. 441

This paper shows that differences in real interest rates across countries can arise even with perfect competition and fully integrated international capital markets. Specifically, I find that factor returns differ across countries that are identical except for technological riskiness, overall productivity, or labor force size. I also show that these differences in technological riskiness, risk aversion, population size, and overall productivity lead to a nonzero current account in the steady state. Higher technological riskiness, greater risk aversion, and a larger population are associated with a current account surplus.

## Social Security and Early Retirement in Japan: Cross-Sectional Evidence

**Tetsuji Yamada** and **Tadashi Yamada**
Working Paper No. 2442
November 1987
JEL No. 913

In Japan, the estimated elasticity of the probability of retirement with respect to Social Security retirement benefits declines as individuals age. The negative impact of Social Security retirement benefits on full-time workers is much greater than the impact on part-time workers for all age groups. Therefore, earnings tests in Japan are more effective for full-time elderly workers than for part-time elderly workers. Social Security retirement benefits also provide the elderly with an incentive to prolong their unemployment status. The marginal effect of the market unemployment rate on full-time work is significantly larger than its marginal effect on part-time work, and both effects are negative. The elasticity of retirement with respect to the market unemployment rate for those in their 60s is two to three times larger than for those aged 70 and over. Retirement among people in their 60s is quite responsive to changes in labor market conditions.

## Lending to an Insecure Sovereign

**Herschel I. Grossman**
Working Paper No. 2443
November 1987
JEL No. 320

This paper analyzes a reputational equilibrium for sovereign debt. In the model, the sovereign borrows to finance defense spending against threats to its survival in power. It determines simultaneously the amount of sovereign debt and defense spending, the resulting probability of survival, and the sovereign's implied discount rate for future consumption. The optimal amount of debt and defense spending equates the marginal cost of defense spending, in terms of reducing the level of consumption, to the marginal benefit of defense spending, in terms of increasing the probability of surviving to enjoy future consumption. In the reputational equilibrium, however, the amount of debt and the associated discount rate must be small enough so that the short-run gains from debt repudiation are not larger than the long-run costs from the loss of a reputation for being trustworthy.

The analysis shows that the interest rate on the sovereign's debt and the discount rate for the sovereign that results from optimal borrowing and defense spending can be small enough that optimal borrowing and defense spending satisfy the condition for a reputational equilibrium. In this case, the sovereign's inability to make an irrevocable commitment not to repudiate its debts does not hinder its ability to finance its defense against threats to its survival. This result is more likely to obtain if: the expected rate of return that lenders require is smaller, the amount of servicing that a potential successor sovereign would rationally provide for debts incurred by the current sovereign is larger, and the relationship between the current sovereign's discount rate and its probability of surviving in power is closer.

## Nutrition and Infant Health in Japan

**Tadashi Yamada, Tetsuji Yamada,**
and **Frank Chaloupka**
Working Paper No. 2444
November 1987
JEL No. 913

The model presented in this paper emphasizes the importance of the mother's nutritional intake as a de-

terminant of infant health. Using cross-sectional market averages for 1980 and 1981 in Japan, we find that the nutrient intake of the mother during pregnancy is a potential determinant of neonatal and infant mortality in Japan. Increased consumption of calcium and iron leads to improved birth outcomes. Using the results obtained from the estimation of neonatal and infant mortality production functions, we note that increases in the prices of food items, in particular milk and meat, would lead to increases in neonatal and infant mortality rates. We discover that the availability of abortion in Japan, unlike in the United States, is positively related to mortality rates, although never significantly. Finally, we see that cigarette smoking, alcohol consumption, and poor environmental quality all have strongly adverse effects on newborn survival outcomes in Japan.

## Predicting Criminal Recidivism Using "Split Population" Survival Time Models

**Peter Schmidt** and **Ann Dryden Witte**
Working Paper No. 2445
November 1987

In this paper, we develop a survival time model in which the probability of eventual failure is less than one, and both the probability and the timing of failure depend (separately) on individual characteristics. We apply this model to data on the timing of return to prison for a sample of prison releasees, and we use it to make predictions of whether or not individuals will return to prison. Our predictions are more accurate than previous predictions of criminal recidivism. Our model has potential applications in economics; for example, it could be used to model the probability of default and the timing of default on loans.

## Investor Behavior in the October 1987 Stock Market Crash: Survey Evidence

**Robert J. Shiller**
Working Paper No. 2446
November 1987
JEL No. 313

At the time of the October 19, 1987 stock market crash, I sent out questionnaires to both individual and institutional investors about their behavior during the crash and received nearly 1000 responses.

The survey results show that: (1) no news story or rumor appearing on October 19 or over the preceding weekend was responsible for investor behavior; (2) investors' rating of the importance of news appearing over the preceding week showed only a slight relationship to decisions to buy or sell; (3) there was a great deal of investor talk and anxiety around October 19, much more than suggested by the volume of trade; (4) many investors thought that they could predict the market; (5) both buyers and sellers generally thought that the market was overvalued before the crash; (6) most investors interpreted the crash as caused by the psychology of other investors; (7) many investors were influenced by technical analysis; (8) portfolio insurance was only a small part of predetermined stop-loss behavior; and (9) some investors changed their investment strategy before the crash.

## Factor Prices and Welfare under Integrated Capital Markets

**Carol L. Osler**
Working Paper No. 2447
November 1987
JEL No. 411

This paper considers the effect on factor prices and welfare of trade between economies whose production is characterized by nation-specific technological uncertainty. I use a two-country Diamond overlapping-generations model in which technological uncertainty is reflected in factor prices; "equities" refer to claims on the returns to capital. I find that trade in capital is complementary to trade in commodities, in the sense that adding free trade in capital to the spectrum of permitted economic activities will cause significant changes in wages, output, and capital returns. Furthermore, for identical or not very different countries, factor prices move in parallel when free trade in capital is introduced. Specifically, capital returns fall while wages rise, in both countries. These results are based on the portfolio diversification permitted by integration of international capital markets: the reduction of portfolio risk associated with portfolio diversification induces

adjustments in saving behavior that, in turn, change factor prices.

In the realm of normative economics, with the introduction of free trade in capital, the associated changes in portfolio risk and factor returns have welfare effects entirely distinct from those conventionally associated with open markets for goods. Furthermore, the net effect on consumer welfare of a shift to free trade in equities is more likely to be positive than previously thought.

## Economic Development and the Timing and Components of Population Growth

**David E. Bloom** and **Richard B. Freeman**
Working Paper No. 2448
November 1987
JEL No. 841

This paper examines the relationship between population growth and economic growth in developing countries from 1965 to 1985. Our results indicate that developing countries were able to shift their labor force from low-productivity agriculture to the higher-productivity industry and service sectors, and to increase productivity within those sectors, despite the rapid growth of their populations. We also find that at given rates of population growth, income growth is related to the time path of population growth. Population growth caused by high birth and death rates is associated with slower income growth than population growth caused by relatively low birth and death rates. Hence, the timing and components of population growth are important elements in the process of economic development.

## Trade Policy under Endogenous Credibility

**Charles M. Engel** and **Kenneth Kletzer**
Working Paper No. 2449
November 1987
JEL No. 431

Because trade liberalization that is anticipated to be temporary creates a divergence between the effective domestic rate of interest and the world rate of interest, tariff reduction in the presence of international financial asset trade may reduce welfare for a small country. Calvo has argued that even though the government intends to liberalize trade permanently, if the private sector believes with some probability that a tariff will be imposed in the future, then free trade may not be optimal.

This paper first formalizes this argument and then discusses the optimal policy for a government that seeks to maximize representative household welfare. The government's lack of credibility is represented by a set of beliefs that the private sector holds about the type of government it faces. Next, we make beliefs endogenous by allowing the private sector to update them using Bayes's rule. In one approach, the government's true objective is to maximize welfare for the economy. With learning, the government eventually adopts free trade, even though restricted trade is initially optimal.

## What Do We Learn from Unit Roots in Macroeconomic Time Series?

**Danny Quah**
Working Paper No. 2450
December 1987

It is often argued that the presence of a unit root in aggregate output implies that there is no "business cycle": the economy does not return to trend following a disturbance. This paper makes this notion precise but then develops a simple aggregative model in which this relationship is contradicted. In the model, output both has a unit root and displays repeated short-run fluctuations around a deterministic trend. I present some summary statistical evidence that suggests that the phenomena described in the paper are not without empirical basis.

## Welfare Dominance: An Application to Commodity Taxation

**Joel B. Slemrod** and **Shlomo Yitzhaki**
Working Paper No. 2451
December 1987
JEL No. 321

In this paper, we suggest a method that enables the user to identify commodities that all individuals will find worth subsidizing or taxing, in the absence of efficiency considerations. The individuals must first agree on certain weak assumptions about social welfare. Our method is based on an extension of the stochastic dominance criteria. We illustrate it using data from Israel.

## Quality Upgrading and Its Welfare Cost in U.S. Steel Imports, 1969-74

**Randi Boorstein** and **Robert C. Feenstra**
Working Paper No. 2452
December 1987
JEL Nos. 422, 631

In this paper we use an index number method to measure the quality change that has occurred in U.S. steel imports during the 1969-74 Voluntary Restraint Agreement (VRA). We break the yearly changes in unit values into three components: a quality-adjusted or pure price index; a quality index, which measures changes in the product mix; and a supplier index, which measures changes in the source of supply. We also derive a measure of welfare cost, which equals the inverse of a Paasche price index minus the inverse of an exact price index. Over the 1969-74 VRA period, the quality of U.S. steel imports was upgraded by 7.4 percent, mostly in the first year. The welfare cost of that quality change varies around 1 percent of import expenditure from 1970-73. This cost is at least as large as the conventional deadweight loss triangle but smaller than the transfer of quota rents.

## Symmetric Pass-Through of Tariffs and Exchange Rates under Imperfect Competition: An Empirical Test

**Robert C. Feenstra**
Working Paper No. 2453
December 1987
JEL Nos. 422, 431

This paper examines the effect of tariffs and exchange rates on U.S. prices of Japanese cars, trucks, and motorcycles. In particular, we ask whether the long-run pass-through of tariffs and exchange rates is identical. We find that this symmetry hypothesis is accepted easily in our sample. We also find that the pass-through relationship varies across products, ranging from about 0.6 for trucks to 1.0 for motorcycles. These coefficients have very different implications for trade policy. We explain the results based on demand, cost, and institutional conditions in each industry. We also find weak evidence that the pass-through of exchange rates has fallen in more recent years.

## Wage Gaps and Output Gaps: Is There a Common Story for All of Europe?

**Robert J. Gordon**
Working Paper No. 2454
December 1987
JEL Nos. 134, 824

This paper studies the relationship between real wages and unemployment in Europe. It finds no evidence that high real wages are responsible for the differing behavior of unemployment in Europe as contrasted with the United States. Across European countries, patterns of real wage behavior are the opposite of what would be required to link high real wages and high unemployment. Among the specific results are: (1) After adjustment for the income of the self-employed, there is no evidence of excessive real wages in Europe. "Wage gap" (that is, labor's share) indexed on a 1972 base was almost identical in Europe and the United States in 1963 and 1984. The slight bulge in the European wage gap between 1974 and 1978 amounts to only about five percentage points over the U.S. values.

(2) There was indeed a real wage explosion between 1966 and 1975 in three small high-unemployment countries (Belgium, Denmark, Netherlands). But the wage gap barely moved in the four large high-unemployment countries (France, Germany, Italy, United Kingdom), and in fact increased substantially less than in low-unemployment Austria. Thus the wage gap concept is almost useless in providing an explanation of differences in unemployment experience *within* Europe.

(3) Aggregation tests provide further skepticism regarding the relevance of wage and price adjustment for the European unemployment problem. Tests for pooling wage change equations across national boundaries in Europe are accepted universally. There are no significant differences in wage behavior within Europe, except for country-specific instances of wage push or incomes policies.

(4) The paper does not explain high unemployment in Europe, and it does not deny that the natural unemployment rate compatible with a constant inflation rate has increased substantially since 1972 in every European country. However, output gaps in Europe are not zero. The econometric estimates imply that the unemployment rate could be pushed down by three percentage points, particularly in France and Germany, without causing an acceleration of inflation.

(5) Some might argue that wage gaps in Europe in the 1980s have been pushed down by economic slack and would bounce back if unemployment fell substantially. However, the claim that wage gaps have been held down by high unemployment and low output in the 1980s amounts to an acceptance of one of the major conclusions of this paper: Europe has experienced a substantial Keynesian output gap in the 1980s, and not all of the increase in European unemployment is "structural" or "classical" in nature.

## U.S. Commercial Banks and the Developing Country Debt Crisis

**Jeffrey D. Sachs** and **Harry Huizinga**
Working Paper No. 2455
December 1987

We find that the commercial banks have weathered the debt crisis, while many debtor countries remain in economic paralysis or worse. There is a growing consensus that much of the LDC (less developed country) debt will not be fully serviced in the future, and that consensus is reflected in at least two ways: in the discounts observed in the secondary market prices for LDC debt; and in the discounts in the stock market pricing of banks with exposure in the LDCs.

## Means of Payment in Takeovers: Results for the United Kingdom and United States

**Robert S. Harris, Julian Franks,** and **Colin Mayer**
Working Paper No. 2456
December 1987
JEL No. 520

This paper examines means of payment in over 2500 acquisitions in the United Kingdom and United States from 1955 to 1985. We use data on financing proportions, bid premiums, and postmerger performance to test the validity of tax and information hypotheses. We find it difficult to explain many of the results in terms of tax effects. The capital gains tax does not appear to be a primary determinant of financing patterns in the United Kingdom in a period in which there were substantial variations in the tax rate. The tax-motivated "trapped-equity" model is also inconsistent with several observations on financing patterns.

In both countries, much larger acquiree bid premiums are associated with cash than equity bids, consistent with information models suggesting that high-valuing bidders make cash offers and low-valuing bidders make securities offers. Even after controlling for the form of takeover (tender versus merger) and whether the bid is contested, cash offers provide substantially higher wealth gains to target shareholders. In the United States, bidders using all equity suffer significant abnormal losses at the time of the bid announcement; that is consistent with the findings on the wealth effects of seasoned new equity offerings in the United States. In the United Kingdom, however, no such losses are evident, perhaps reflecting the fact that equity bids in the United Kingdom are typically underwritten.

Finally, we find that acquirors making cash offers have better postmerger share price performance than do those using equity. These results are consistent with the hypothesis that bidders are motivated to use overvalued equity to acquire other firms.

## Patents, Citations, and Innovations: Tracing the Links

**Manuel Trajtenberg**
Working Paper No. 2457
December 1987

This paper tackles the main problems encountered in using patent data in economic research: the large variance in the value of patents and the difficulties in matching patents with economic categories. I address the first problem with the aid of patent citations and the second with computerized search techniques for large databases. I apply my proposed solutions to Computed Tomography (CT) Scanners, a pathbreaking innovation in medical technology. I find that patents weighted by citations are highly correlated with the value of innovations and that important innovations generate further innovative activity (R and D) and hence bring about patents down the line.

## Information and Multiperiod Optimal Income Taxation with Government Commitment

**Dagobert L. Brito, Steven M. Slutsky, Jonathan H. Hamilton,** and **Joseph E. Stiglitz**
Working Paper No. 2458
December 1987
JEL No. 022

The optimal income taxation problem has been studied extensively in one-period models. But when consumers work for many periods, what information (if any) that the government learns about abilities in one period can be used to attain more redistribution than in a one-period world? When the government must commit itself to future tax schedules, the gains come from relaxing self-selection constraints by intertemporal nonstationarity. The effect of nonstationarity is analogous to that of randomization in one-period models.

In a model with two ability classes, the key use of information is that only a single lifetime self-selection constraint for each type of consumer must be imposed. We give some necessary and sufficient conditions for randomization or nonstationarity. The planner can make additional use of the information when individual and social rates of time discounting differ. In this case, the limiting tax schedule is nondistorting if the government has a lower discount rate than individuals do.

## Trigger Strategies and Price Dynamics in Equity and Foreign Exchange Markets

**Paul R. Krugman**
Working Paper No. 2459
December 1987
JEL No. 431

Trigger strategists may be defined as actors in asset markets who buy or sell when the price reaches a predetermined level; they include participants in portfolio insurance schemes in equity markets and central banks who intervene to defend an exchange rate target zone. This paper presents an approach to modeling the effects of trigger strategists, with emphasis on how target zones affect market expectations. I show that commitment to defend a target zone will generate stabilizing expectations within the band, which may generate a "target zone honeymoon": an extended period in which the announcement of a target zone stabilizes exchange rates without any need for action on the part of authorities. However, an imperfectly credible target zone is vulnerable to crises in which the market tests the authorities' resolve.

## International Capital Mobility and Tax Evasion

**Alberto Giovannini**
Working Paper No. 2460
December 1987
JEL Nos. 411, 423, 433, 441

This paper studies the welfare effects of international investment undertaken to evade domestic taxes on domestic investment income. Capital mobility for tax evasion eliminates distortions in the intertemporal allocation of consumption but introduces distortions in domestic production. Conversely, a regime in which residents pay taxes on all investment income, domestic and foreign, introduces distortions in intertemporal consumption allocation but leaves domestic production free of distortion. The relative magnitude of the intertest elasticity of savings and of domestic investment determines the welfare effects of capital movements for the purpose of tax evasion.

## Some Notes on the Scientific Methods of Simon Kuznets

**Robert W. Fogel**
Working Paper No. 2461
December 1987

This paper discusses the scientific methods that guided the economic research of Simon Kuznets, with particular stress on his approach to measurement and theory. The paper closes with the transcription of a brief autobiographical talk by Kuznets at a dinner in honor of his 80th birthday.

## The Incidence and Efficiency Costs of Corporate Taxation When Corporate and Noncorporate Firms Produce the Same Good

**Jane G. Gravelle** and **Laurence J. Kotlikoff**
Working Paper No. 2462
December 1987
JEL No. 321

This year marks the 25th anniversary of Arnold Harberger's celebrated model of the corporation income tax. While the model has been enormously useful as an analytical device for studying two sector economies, its usefulness for understanding the incidence and excess burden of the corporate income tax remains in question. One difficulty confronting all empirical analyses of the Harberger model is how to treat noncorporate production in primarily corporate sectors and corporate production in primarily noncorporate sectors. The Harberger model provides no real guide to this question since it assumes that one good is produced only by corporations and the other good is produced only by noncorporate firms. Stated differently, Harberger models the differential taxation of capital used in the production of different goods, rather than the taxation of capital used by corporations per se.

This paper presents a two-good model with corporate and noncorporate production of both goods. The incidence of a corporate tax in our mutual production model (MPM) can differ markedly from the incidence in Harberger's model. A hallmark of Harberger's corporate tax incidence formula is its dependence on differences across sectors in elasticities of substitution between capital and labor. In contrast, the incidence of the corporate tax in the MPM may fall 100 percent on

capital regardless of sector differences in substitution elasticities.

The difference between the two models in the deadweight loss from corporate taxation is also striking. Using the Harberger-Shoven data and assuming unitary substitution and demand elasticities, the deadweight loss is over ten times larger in one version of the MPM than in the Harberger model. Part of the explanation for this difference is that, in the Harberger model, only the difference in the average corporate tax in the two sectors is distortionary, while in the MPM the entire tax is distortionary. A second reason for the larger excess burden in the MPM is that it has a very large, indeed infinite, substitution elasticity in demand between corporate and noncorporate goods. In contrast, applications of the Harberger model assume that this elasticity is quite small.

## Pension Backloading, Wage Taxes, and Work Disincentives

**Laurence J. Kotlikoff** and **David A. Wise**
Working Paper No. 2463
December 1987
JEL Nos. 323, 820, 824

The federal government is actively involved in encouraging the formation and growth of private pensions and in regulating their behavior. The primary form of encouragement is the government's tax subsidization of pensions. A primary attribute of pension plan provisions is an implicit tax on employment after certain ages. The primary form of pension regulation is through ERISA, the Employee Retirement Income Security Act. The government's involvement in encourging and regulating private pensions appears to reflect its desire that workers have a secure source of old age income that will lessen their reliance on Social Security. In recent years, the government has reacted to demographic changes and their effects on Social Security funding, and to the increase in early retirement, by also using its pension and Social Security tax and regulatory policies to encourage workers to delay their retirement decision.

This paper examines the structure of pension plans with two questions in mind. First, have government pension backloading regulations, aimed at assuring future benefits, been effective? Second, has the structure of old age pension accrual at the end of the workspan, an implicit tax, greatly limited the effectiveness of government policy in reversing the trend to early retirement? The answers to these questions are important for assessing the benefits of the government's tax subsidization of pensions, as they are structured currently.

The principal findings of this study are: (1) ERISA regulations notwithstanding, a significant proportion of defined-benefit plans exhibit severe backloading. Indeed, backloading is an inherent property of defined-benefit pension plans. (2) A large fraction of defined-benefit plans embed very substantial old age work disincentives, through an implicit tax on wage earnings. (3) These pension retirement incentives are often much greater than Social Security's retirement incentives. (4) Evidence from one large *Fortune* 500 firm indicates that pension retirement incentives can increase greatly the extent of early retirement.

## The Flexible Exchange Rate System: Experience and Alternatives

**Rudiger Dornbusch** and **Jeffrey A. Frankel**
Working Paper No. 2464
December 1987
JEL Nos. 432, 431

We review ten aspects of how floating exchange rates have worked in practice, contrasted with ten characteristics that the system was supposed to have in theory. We conclude that the foreign exchange market is characterized by a high volume of transactions, short-term horizons, and an absence of stabilizing speculation. As a result, at times the exchange rate strays from the equilibrium level dictated by fundamentals, contrary to theory.

We then look at ten proposed alternatives to the current system. Four entail decentralized policy rules: new classical macroeconomics; a gold standard; monetarism; and nominal income targeting. Four foresee enhanced international coordination: G-7 "objective indicators"; Williamson target zones; McKinnon "world monetarism"; and a "Hosomi Fund." Two propose enhanced independence: a "Tobin tax" on transactions; and a dual exchange rate. We conclude that one might build a case for intervention from the observed failure of international financial markets to behave as in the theoretical ideal, but that in practice government intervention is just as likely to fall short of the theoretical ideal.

## Industry Effects and Appropriability Measures in the Stock Market's Valuation of R and D and Patents

**Iain Cockburn** and **Zvi Griliches**
Working Paper No. 2465
December 1987
JEL No. 620

This paper examines the stock market's valuation of a firm's innovative activity. We estimate the market's relative valuation of firms' tangible and intangible assets, focusing on knowledge capital in the form of accumulated "stocks" of R and D and patents. We tried to improve upon our estimates of the stock market's valuation of knowledge capital embodied in such stocks by bringing in measures of the appropriability environment facing a firm from the Yale Survey on *Industrial Research and Development*. The responses to survey questions about the effectiveness of patents as a mechanism for protecting the returns from innovation turn out to be of some use: there is evidence of an interaction between industry level measures of the effectiveness of patents and the market's valuation of a firm's past R and D and patenting performance, as well as its current R and D moves. We find no evidence, however, that other appropriability mechanisms differ enough across industries to leave measurable traces in our data. The structure of the Yale Survey makes it possible to estimate the sampling error in the appropriability measures derived from it. We used this information in an errors-in-variables context, but with little success. In the absence of R and D variables, our estimates imply that a two-standard-deviation increase in our index of patent effectiveness would raise the value of a patent held by our average firm from $0.4 million to $1.0 million. When we introduce R and D variables into the equations, the patents variables become insignificant—R and D expenditures are a better measure of input to the innovative function of firms than patents are of its output—but we estimate that the same experiment would induce changes in $q$ between 10 and 27 percent for the average firm, approximately doubling the market's valuation of this kind of capital.

## The Gains from Fiscal Cooperation in the Two-Commodity Real Trade Model

**Stephen J. Turnovsky**
Working Paper No. 2466
December 1987
JEL No. 411

This paper analyzes the gains from fiscal cooperation in the context of the standard, two-commodity real trade model. It shows how the adjustment in terms of trade is the critical factor in determining the effects of moving away from a noncooperative equilibrium. In general, a noncooperative equilibrium leads to an overexpansion of government expenditure on the export good and an underexpansion on the import good, relative to a cooperative equilibrium. I also consider the specific example of a logarithmic economy. The paper further discusses the welfare effects resulting from the formation of a coalition between two countries.

## Dynamic Strategic Monetary Policies and Coordination in Interdependent Economies

**Stephen J. Turnovsky, Tamer Basar,** and **Vasco d'Orey**
Working Paper No. 2467
December 1987
JEL No. 432

This paper develops strategic monetary policies using a standard, two-country macro model under flexible exchange rates. We consider feedback Nash and feedback Stackelberg equilibriums and compare both to the Pareto optimal cooperative equilibrium. The optimal policies are feedback rules in which real money supplies adjust to movements in the real exchange rate. We analyze these policies and their welfare implications using numerical simulations. The difference between our results and those obtained previously for a short-run horizon suggest the importance of both intertemporal and intratemporal trade-offs in determining optimal strategic policies.

## The Politics of Ambiguity

**Alberto Alesina** and **Alex Cukierman**
Working Paper No. 2468
December 1987

In general, politicians have two motives: they wish to hold office as long as possible, and they wish to implement the policies they prefer. Thus, they face a tradeoff between the policies that maximize their chances of reelection and their most preferred policies (or the policies most preferred by their constituencies). We analyze this trade-off in a dynamic electoral model in

which the voters are not fully informed about the incumbents' preferences. First, we show that in general there is incomplete policy convergence: incumbents follow policies that are intermediate between the other party's ideal policies and their own policies. Second, we show that under some circumstances, incumbents have an incentive to choose procedures that make it more difficult for voters to pinpoint incumbents' preferences with absolute precision. Thus, politicians may prefer to be ambiguous and "hide," at least to a certain extent, their true preferences. This result holds up for a wide range of parameter values and, in some range, even if voters are risk averse.

## Quits, Moves, Spatial Equilibrium, and Workplace Relocation

**Jeffrey S. Zax**
Working Paper No. 2469
December 1987
JEL Nos. 824, 930

When worker commutes are less than optimal, there is a relationship between quits and moves. Either quitting, moving, or both can bring about an optimal commute. However, since quitting and moving have fixed costs, it is more likely that the worker quit *or* move but not both.

Payroll records of a firm that relocated from the central business district to a suburb of a major metropolitan area confirm this. They demonstrate that white employees rarely quit and move at the same time. Simultaneous bivariate probit estimates of move and quit behavior demonstrate that uncontrolled shocks to quits and moves are negatively correlated. Furthermore, during the spatial dislocation caused by the firm's relocation, quits and moves were direct substitutes. Employees who quit were approximately 29 percent less likely to move. Those who moved were approximately 40 percent less likely to quit.

## A Dynamic Programming Model of Retirement Behavior

**John Rust**
Working Paper No. 2470
December 1987
JEL No. 211

This paper formulates a model of retirement behavior based on the solution to a stochastic dynamic programming problem. The workers' objective is to maximize expected discounted utility over their remaining lifetimes. At each time period, workers choose how much to consume and whether to work full time, part time, or to leave the labor force. The model accounts for the sequential nature of the retirement decision problem, and for the role of expectations of such uncertain future variables as: the workers' life span; health status; marital and family status; employment status; and earnings from employment, assets, and Social Security retirement, disability, and Medicare payments.

This paper applies a "nested fixed point" algorithm that converts the dynamic programming problem into the problem of repeatedly recomputing the fixed point to a contraction mapping operator as a subroutine of a standard, nonlinear, maximum-likelihood program. The goal of the paper is to demonstrate that a fairly complex and realistic formulation of the retirement problem can be estimated using this algorithm and a current-generation supercomputer, the Cray-2.

## The Dynamics of Housing Demand by the Elderly: Wealth, Cash Flow, and Demographic Effects

**Jonathan Feinstein** and **Daniel McFadden**
Working Paper No. 2471
December 1987
JEL No. 932

We investigate the pattern of housing mobility among the elderly, focusing on two issues: (1) which household characteristics tend to increase the probability of a move; and (2) whether elderly households systematically move to smaller, less expensive dwellings when they do move, and, if so, which characteristics make such "downsizing" particularly likely. We find that wealthier households are less likely to move and to downsize, and that changes in family composition or retirement status significantly increase the likelihood of a move. We do not find much evidence of imperfections in the housing market or of pervasive liquidity constraints. Finally, we test for unobserved heterogeneity among elderly households and strongly reject the null hypothesis of homogeneity.

## The Case of the Negative Nominal Interest Rates: New Estimates of the Term Structure of Interest Rates during the Great Depression

**Stephen G. Cecchetti**
Working Paper No. 2472
December 1987
JEL Nos. 042, 223, 310

During the 1930s and early 1940s, U.S. Treasury bonds and notes had negative nominal yields as they approached maturity. But since an investor can always hold cash, this seems impossible: any bond must have a positive nominal yield. This paper poses a resolution to this puzzle: in addition to making coupon payments, Treasury securities were options that gave the owner the right to buy a new security on a future date. The paper proposes a method for valuing this "exchange privilege" and computing the yield to the coupon-bearing component of the composite bond/options. The case of the negative nominal interest rates demonstrates that the construction of accurate data requires close examination of the institutional environment, even when studying financial markets.

I use the corrected bond and note yields to calculate new estimates of the term structure of interest rates from 1929 to 1949, allowing me to follow changes in both the level and the shape of the yield curve during the Great Depression.

## Recent Developments in Macroeconomics

**Stanley Fischer**
Working Paper No. 2473
December 1987
JEL No. 310

This paper surveys much of modern macroeconomics. The focus is on the core macroeconomic issue: the reasons for macroeconomic fluctuations and sometimes persistent unemployment. To provide continuity and perspective on how promising research leads of the past have turned out, the paper starts by summarizing developments since the Barro-Fischer (1976) survey of monetary economics. Sections III and IV develop in some detail the current representations of the two basic approaches to macroeconomics: the equilibrium business cycle approach and new Keynesianism. Brief sketches of developments in several areas of research in Section V broaden the coverage. Section VI contains concluding comments.

## Recent Developments in Macroeconomics: A Very Quick Refresher Course

**N. Gregory Mankiw**
Working Paper No. 2474
December 1987
JEL No. 130

This paper outlines the major developments in macroeconomics over the past two decades. It examines the reasons for the breakdown in the consensus view of the 1960s and how this breakdown has guided research in macroeconomics. I discuss the introduction and importance of rational expectations and recent advances within the new classical and new Keynesian paradigms.

## Monetary Policy and Performance in the United States, Japan, and Europe: 1973-86

**Stanley Fischer**
Working Paper No. 2475
December 1987
JEL No. 310

This paper compares and evaluates monetary policies in the United States, Japan, Germany, and the United Kingdom over 1973–86, to draw lessons for monetary policy from the recent historical record. During this period, all four countries shifted to money targeting, although with differing degrees of commitment, seriousness, and persistence. The Bundesbank and the Bank of Japan each focus on one money target, described by the Bundesbank as a target and by the Bank of Japan as a projection. None of the countries has stuck rigorously to the targets, although the Bank of Japan has come close.

The most striking contrast in the outcomes of policy is between Japan and Germany in the second oil shock. By that stage, both their central banks must have acquired significant anti-inflationary reputations. Nonetheless, whereas the rate of increase of nominal wages in Japan fell to accommodate the increased price of oil, and Japan avoided a recession, the rate of wage increase in Germany increased and was followed by a serious recession. The cause of the difference in results appears to lie much less in the credibility of the policymakers than in the behavior of wage earners. Differences between the outcomes of policy in the United States and United Kingdom also suggest that the role of the reputation of policymakers is extremely difficult to quantify at best. Outcomes in all countries suggest that monetary rules that do not accommodate changes in velocity can cause unnecessary movements in output.

## Real Rigidities and the Nonneutrality of Money

**Laurence Ball** and **David Romer**
Working Paper No. 2476
December 1987

Rigidities in real prices are not sufficient to create rigidities in nominal prices and real effects of nominal shocks. By themselves, small frictions in nominal adjustment, such as costs of changing prices, create only small nonneutralities. This paper shows that substantial nominal rigidity can arise from a *combination* of real rigidities and small nominal frictions. It shows the connection between real and nominal rigidity given the presence of nominal frictions, both in general and for several specific sources of real rigidity: costs of adjusting real prices, asymmetric demand arising from imperfect information, and efficiency wages.

## Productivity in American Whaling: The New Bedford Fleet in the Nineteenth Century

**Lance E. Davis, Robert E. Gallman,**
and **Teresa Hutchins**
Working Paper No. 2477
December 1987
JEL No. 040

From the end of the War of 1812 until the Civil War, the whaling fleet of New Bedford, Massachusetts, grew spectacularly; thereafter it declined, equally spectacularly. By the end of the century, New Bedford's day was over. During these 88 years, the technical configuration of the fleet, the hunting grounds visited, and the types of whales pursued all changed dramatically, and more than once.

The literature on whaling suggests that the collapse of the industry was caused in part by declining productivity, occasioned by the disappearance of the whales (because of overhunting) and the deterioration of the quality of labor. The shifts in the composition of the fleet are viewed chiefly as the result of efforts by whalemen to overcome their problems.

In this paper, we use productivity data (superlative indexes) by voyage in multiple regression analysis to trace the relationships between the changes in the composition of the fleet and productivity. We test the propositions that declining labor quality and whale stocks had important consequences for productivity and measure the impacts of technical changes on productivity.

## The Taxation of Income from Capital in the United States, 1980-6

**Don Fullerton** and **Marios Karayannis**
Working Paper No. 2478
December 1987
JEL No. 323

Tax rules have changed almost yearly in the United States since 1980. In particular, the Economic Recovery Tax Act of 1981 reduced marginal tax rates and shortened depreciation lifetimes, while the Tax Reform Act of 1986 reduced marginal tax rates, repealed the investment tax credit, and lengthened depreciation lifetimes.

This paper estimates marginal effective tax rates on income from capital under each year's tax law, using the methodology of King and Fullerton (1984) to maintain comparability with earlier calculations for the United States and current calculations for other countries. The 1981 law substantially reduced effective tax rates, while subsequent changes raised them again. A primary effect of the 1986 law was to make diverse effective tax rates more uniform.

## The U.S.-Japan Trade Imbalance from the Japanese Perspective

**Ryuko Sato**
Working Paper No. 2479
January 1988
JEL No. 421

By 1981, Japan achieved both internal and external equilibrium: exports and imports roughly balanced at 16 percent of the gross national product. However, within the country, there was concern that the growth in the government, accompanied by rising budget deficits, would make it impossible for the economy to cope

with a future crisis similar to the oil price shocks of the 1970s. The Chairman of Keidaren, Mr. Doko, called for a "philosophy of preservance" requiring government austerity and individual sacrifice.

The expected crises never occurred but the policies followed led to a balance-of-payments surplus. There are few scientific studies to determine the exact sources of these imbalances, but indications are that 40 percent of the gap was caused by differences in growth in demand at home and abroad, 30 percent by differences in the elasticity of import and export functions, and 30 percent movement in the exchange rate.

Political and economic frictions may arise when there is an attempt to treat the symptom without reforming the fundamental structure. Proper strategies can convert the "zero-sum game" to a "positive-sum game."

## Target Zones and Exchange Rate Dynamics

**Paul R. Krugman**
Working Paper No. 2481
January 1988
JEL Nos. 431

This paper develops a highly simplified model of exchange rate behavior within the band under a target zone regime. It shows that the expectation that authorities will defend the band exerts a stabilizing effect on exchange rate behavior within the band, even when the authorities are not actively intervening. The extent of stabilization can be related in a straightforward way to three factors: the sensitivity of the current exchange rate to expected depreciation; the volatility of the process driving exchange rate "fundamentals"; and the credibility of the commitment by authorities to defend the target zone.

## Real Business Cycle Models

**Bennett T. McCallum**
Working Paper No. 2480
January 1988
JEL Nos. 130, 023

This paper evaluates the strengths and weaknesses of the real business cycle approach to the analysis of macroeconomic fluctuations. It begins with a description of the basic analytical structure typically employed, one in which individual households make consumption and labor supply decisions while producing output from capital and labor inputs, hired on competitive markets, according to a technology that is subject to stochastic shocks. It then explores conditions on parameter values that are needed for a model of this type to yield fluctuations that provide a good quantitative match to those observed in the postwar U.S. quarterly data. I consider the plausibility of the hypothesis that (unobservable) aggregate technology shocks have the requisite variability and note problems with certain cross correlations. I then summarize relevant evidence obtained by formal econometric methods and suggest a few tentative conclusions regarding business cycle research.

## Fiscal Policies and the Dollar/Pound Exchange Rate: 1870–1984

**Vittorio Grilli**
Working Paper No. 2482
January 1988
JEL No. 431

This paper investigates the consequences of fiscal policies for the exchange rate. After developing a simple theory of how government financing policies should affect the exchange rate, I test it using data on the dollar/pound exchange rate. Previous analyses have concentrated mainly on the post-Bretton Woods flexible exchange rate system, thus ignoring potentially useful information contained in fixed exchange rate periods or in previous flexible exchange rate periods. This paper shows that it is theoretically proper and econometrically feasible to merge evidence from different nominal exchange rate systems. By this procedure, we can extend the sample period back to the 1870s. My results suggest that permanent government expenditures are the only fiscal variables that significantly affected the dollar/pound nominal exchange rate. Budget deficits appear to have been irrelevant in this respect.

# NBER Reporter

Nonprofit Org.
U.S. Postage
Paid
Boston, MA
Permit No. 55932

National Bureau of Economic Research, Inc.
1050 Massachusetts Avenue
Cambridge, Massachusetts 02138
(617) 868-3900

Address Correction Requested