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# NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

SUMMER 1989

## Program Report

### Economic Fluctuations

Robert E. Hall

In the three years since my last Program Report, the NBER's Program in Economic Fluctuations has grown from 38 to 69 participants and has produced more than 200 Working papers. This article summarizes some of the major topics that we have addressed.

#### Research on Overall Macroeconomic Performance

One important area of research in the economic fluctuations program involves tracking down the sources of booms and recessions in the United States and other countries and understanding the role of financial and other factors in propagating these fluctuations. To that end, Ben S. Bernanke and Alan S. Blinder have studied the interaction between the real and financial sectors of the U.S. macroeconomy.<sup>1</sup> Bernanke and Mark Gertler have developed theoretical models to show how the net worth of borrowers can affect the stability and cyclical characteristics of the economy.<sup>2</sup> In related empirical work, Bernanke and John Y. Campbell have studied the phenomenon of increasing leverage of U.S. corporations.<sup>3</sup>

Motivated by the recent European experience, Olivier J. Blanchard has explored channels through which supply and demand shocks have long-lasting effects on the economy's equilibrium. In particular, with Danny

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This issue of the *Reporter* highlights the Bureau's research on economic fluctuations. Next, Andrew W. Lo describes his work on stock market prices. Then, Stephen P. Zeldes reports on his study of consumption and saving behavior. 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.

Quah, he has studied the roles of bargaining in the labor market and imperfect competition in the goods market.<sup>4</sup>

Lawrence H. Summers has urged greater attention to relative wage theories in attempts to understand unemployment.<sup>5</sup> The importance of relative wages in different jobs, emphasized by Keynes, is related closely to recent efficiency wage theories. Empirically, Summers and Blanchard have written about the persistence

<sup>1</sup>B. S. Bernanke and A. S. Blinder, "Credit, Money, and Aggregate Demand," NBER Working Paper No. 2534, March 1988.

<sup>2</sup>B. S. Bernanke and M. Gertler, "Financial Fragility and Economic Performance," NBER Working Paper No. 2138, July 1987.

<sup>3</sup>B. S. Bernanke and J. Y. Campbell, in *Brookings Papers on Economic Activity* 1 (1988).

<sup>4</sup>O. J. Blanchard and D. Quah, "The Dynamic Effects of Aggregate Demand and Supply Disturbances," NBER Working Paper No. 2737, October 1988.

<sup>5</sup>L. H. Summers, "Relative Wages, Efficiency Wages, and Keynesian Unemployment," NBER Working Paper No. 2590, May 1988.

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of European unemployment, asking why unemployment remains so high near the so-called "full" employment level. In another area of research, Summers and Chris Carroll have compared private saving behavior in the United States and Canada.<sup>6</sup>

Bennett T. McCallum has produced a number of integrated overviews of several major areas of macroeconomic analysis.<sup>7</sup>

Christina D. Romer has focused on the causes of business cycles in the pre-World War II period and the changes in the nature of business cycles between the prewar and the postwar eras. In one study, she examined the role of the Great Crash of the stock market in October 1929 in initiating the Great Depression.<sup>8</sup> Another study found that beneficial supply shocks related to an agricultural boom may explain both the rapid deflation in 1921 and the fact that total production declined only slightly in that year, despite large declines in aggregate demand.

Mark W. Watson has worked on theoretical and empirical issues associated with the analysis of long-run relationships in aggregate economic time-series data. He has studied properties of univariate detrending methods, developed tests for cointegration (with James H. Stock), studied asymptotic properties of estimators in autoregressive models in the presence of unit roots (with Stock and Christopher Sims), and investigated the relationship between permanent and cyclical shocks to the economy (with Robert G. King, Charles I. Plosser, Stock, and Matthew D. Shapiro). In addition, Watson and Stock have served as codirectors of an NBER project to develop a new set of leading and coincident economic indicators.<sup>9</sup>

David Romer has been conducting research on whether—and if so, how—nominal disturbances have real effects. With Christina Romer he has investigated this question empirically by using nonstatistical information to isolate monetary disturbances.<sup>10</sup> With Laurence

<sup>6</sup>O. J. Blanchard and L. H. Summers, "Hysteresis and the European Unemployment Problem," NBER Reprint No. 808, January 1987; L. H. Summers, "Why Is the Unemployment Rate So Very High Near Full Employment?" NBER Reprint No. 838, March 1987; and C. Carroll and L. H. Summers, "Why Have Private Saving Rates in the United States and Canada Diverged?" NBER Working Paper No. 2319, July 1987.

<sup>7</sup>B. T. McCallum, "Inflation: Theory and Evidence," NBER Working Paper No. 2312, July 1987; "Real Business Cycle Models," NBER Working Paper No. 2480, January 1988; and "The Development of Keynesian Macroeconomics," NBER Reprint No. 947, December 1987.

<sup>8</sup>C. D. Romer, "The Great Crash and the Onset of the Great Depression," NBER Working Paper No. 2639, June 1988.

<sup>9</sup>R. G. King, J. H. Stock, C. I. Plosser, and M. W. Watson, "Stochastic Trends and Economic Fluctuations," NBER Working Paper No. 2229, April 1987; and J. H. Stock and M. W. Watson, "A Probability Model of the Coincident Economic Indicators," NBER Working Paper No. 2772, November 1988.

<sup>10</sup>C. D. Romer and D. Romer, "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz," NBER Working Paper No. 2966, May 1989.

Ball, Romer has derived and tested an implication of endogenous models of price rigidity that differed from the predictions both of New Classical models and of the traditional Keynesian models that simply postulate the existence of price rigidity.<sup>11</sup>

John H. Cochrane has studied the random properties of aggregate output in the United States. His work shows that GNP probably has a tendency to return to a long-run growth path after a disturbance, but that the rate of return is slow. His research on consumption concludes that rejections of the permanent-income hypothesis and consumption-based asset pricing models can be caused by behavior that costs consumers a few cents per month.<sup>12</sup>

Campbell has studied the persistence of economic fluctuations. The traditional view is that fluctuations have little long-run effect because output returns rapidly to trend. In work with N. Gregory Mankiw, however, Campbell has argued that there is no empirical evidence for this return to trend. In fact, postwar U.S. data are consistent with the view that a 1 percent shock to the level of GNP should lead one to revise one's long-run forecast of GNP by more than 1 percent.<sup>13</sup> In work with Angus Deaton, Campbell has developed the implications of persistent fluctuations for the behavior of consumption.<sup>14</sup>

Steven N. Durlauf has worked on econometric issues raised by the research of Campbell-Mankiw, Cochrane, and others, which show that GNP and other macroeconomic variables have important random movements at frequencies well below the usual business cycle. Durlauf also has collaborated with me on the detection of specification errors or noise in models with expectations. The methods we have developed have applications in the stock market, inventory, investment, consumption, and other branches of macroeconomic research.

Thomas J. Sargent has been studying learning in dynamic economic environments. Specifically, how do various adaptive ways of forming views converge to rational expectations? Sargent's research considers two approaches to learning: recursive least squares and classifier systems from the artificial intelligence literature. His work on least squares is with Albert Marcat; his work on artificial intelligence systems is with

Ramon Marimon. Sargent is also working with Rodolfo Manuelli on monetary theory in the context of models with missing markets.

Victor Zarnowitz has carried out a comparative study of major features of past and recent U.S. macroeconomic fluctuations. His model of lead-lag interactions among measures of real growth, inflation, interest rates, monetary and fiscal changes, and early stages of investment and production processes (selected leading indicators) ranks the effects of these variables similarly for the periods before and after World War II. The recently contested notion that instability diminished in the post-World War II era is generally upheld. Much of the moderation is probably attributable to a combination of structural, institutional, and policy changes. But the economy's performance deteriorated in the second half of the postwar period as compared with the first.<sup>15</sup>

Jeffrey A. Miron, Stephen P. Zeldes, and Robert B. Barsky have examined seasonal fluctuations in aggregate economic activity. Their first goal was to examine the seasonal patterns in standard macroeconomic variables and to document their quantitative importance. Seasonal fluctuations account for more than 85 percent of the fluctuations in the rate of growth of real GNP, and are present in every major type of economic activity. They also have found that business cycles and seasonal cycles are surprisingly similar and that countries or industries that exhibit substantial amounts of seasonal variation are also ones that exhibit substantial amounts of business cycle variation.<sup>16</sup>

Alan C. Stockman has studied the effects of real disturbances on exchange rates, the current account, and other macroeconomic variables.<sup>17</sup> He has also studied related issues concerning portfolio diversification and the international transmission of real aggregate disturbances. A particular focus of this work has been on explaining the higher variability of real exchange rates under floating-rate systems in a model with flexible prices.

Ray C. Fair has considered the sources of output and price fluctuations in the U.S. economy. He has also studied the effect of these macroeconomic events on presidential elections. His work on production and inventories has reached the conclusion that firms use

<sup>11</sup>L. Ball and D. Romer, "Real Rigidities and the Nonneutrality of Money," NBER Working Paper No. 2476, December 1987.

<sup>12</sup>J. H. Cochrane, "The Sensitivity of Tests of the Intertemporal Allocation of Consumption to Near-Rational Alternatives," NBER Working Paper No. 2730, October 1988.

<sup>13</sup>J. Y. Campbell and N. G. Mankiw, "Permanent and Transitory Components in Macroeconomic Fluctuations," NBER Reprint No. 924, October 1987.

<sup>14</sup>J. Y. Campbell and A. Deaton, "Is Consumption Too Smooth?" NBER Working Paper No. 2134, January 1987.

<sup>15</sup>V. Zarnowitz, "The Regularity of Business Cycles," NBER Working Paper No. 2381, September 1987; "Facts and Factors in the Recent Evolution of Business Cycles in the United States," NBER Working Paper No. 2865, February 1989; and "Price, Wage, and Interest Rate Movements in Business Cycle Theories and Experience," forthcoming as an NBER Working Paper.

<sup>16</sup>J. A. Miron and S. P. Zeldes, "Seasonality, Cost Shocks, and the Production-Smoothing Model of Inventories," NBER Reprint No. 1159, May 1989; and R. B. Barsky and J. A. Miron, "The Seasonal Cycle and the Business Cycle," NBER Working Paper No. 2688, August 1988.

<sup>17</sup>A. C. Stockman, "Sectorial and National Aggregate Disturbances to Industrial Output in Seven European Countries," NBER Working Paper No. 2313, July 1987.

inventories to smooth fluctuations in sales, in contrast to findings of other investigators.<sup>18</sup>

Quah has analyzed the aggregate effects of disturbances on the macroeconomy when the random character of GNP includes important permanent movements. He has developed a model that generates random permanent movements for GNP in which all disturbances have only transitory effects.<sup>19</sup> His work with Blanchard treated a macroeconomic model in which the roles of disturbances with permanent and transitory effects were interpreted explicitly. They concluded that demand disturbances played a significant role in explaining fluctuations over horizons of up to four years.<sup>20</sup>

Alan S. Blinder's recent research has centered on consumer durables and on the macroeconomic role of credit. In the former, he and Avner Bar-Ilan have applied the standard microeconomic model of inventories to consumer behavior and have tested its aggregate implications.<sup>21</sup> Blinder and Bernanke have been theoretically developing and empirically testing the role of credit in the transmission mechanism for monetary policy.<sup>22</sup>

Barsky and Gary Solon have looked again at the question of whether real wages are cyclical. Using longitudinal data on particular jobs, they find significant procyclicality; they argue that this fact is hidden in aggregate data by the increase in the number of low-wage workers during economic expansions.<sup>23</sup>

Russell Cooper has studied coordination problems in imperfectly competitive economies. Initial work in this area stressed the conditions under which coordination failures—an economy operating with recession conditions with unused resources—might arise. Subsequent work has focused on the way these economies change over time, the dynamics of entry and exit in

imperfectly competitive economies, and the timing of discrete economic decisions, such as production runs.<sup>24</sup>

Andrei Shleifer, Kevin M. Murphy, and Robert W. Vishny have developed a model showing that when world trade is costly, a country can industrialize profitably only if its domestic markets are large enough. Their related work explores the idea that simultaneous industrialization of many sectors of the economy can be profitable for all of them, even when no sector can break even by industrializing alone. In macroeconomic applications of these ideas, they have developed a model of a business cycle in which a boom is a time when all firms find it desirable to have high output at the same time. Productivity rises in a boom because of favorable interactions among firms.<sup>25</sup>

Paul M. Romer's work has focused on the underlying trends in macroeconomic variables. The central problem in this work is to explain technological change as the outcome of actions taken by individuals acting in markets. Romer has pursued the idea that basic science and applied technical knowledge have features that distinguish them from conventional economic goods. To the extent that pure knowledge can be costlessly used in many different settings, replication arguments imply that it leads to a form of increasing returns to scale.

Andrew B. Abel has examined the role of intergenerational transfers in determining the effects of fiscal policy. This work has studied the conditions under which changes in the timing of taxes have important effects on saving, investment, and interest rates. Some of his work also explores the implications of nonaltruistic bequest motives and the effects of fiscal policy in the presence of various types of private insurance arrangements.<sup>26</sup>

## Macroeconomics and Finance

Kenneth J. Singleton spent the fall of 1988 at the Bank of Japan and since then has been studying the sources of volatility in long-term government bond yields in Japan. He also has worked on the estimation of dynamic models of asset price determination using simulation methods. The methods proposed allow estimation of a

<sup>18</sup>R. C. Fair, "Sources of Output and Variability in a Macroeconomic Model," NBER Working Paper No. 2112, December 1986; "The Effect of Economic Events on Votes for President: 1984 Update," NBER Reprint No. 1187, May 1989; and "The Production-Smoothing Model Is Alive and Well," NBER Working Paper No. 2877, March 1989.

<sup>19</sup>D. Quah, "What Do We Learn from Unit Roots in Macroeconomic Time Series?" NBER Working Paper No. 2450, December 1987.

<sup>20</sup>O. J. Blanchard and D. Quah, "The Dynamic Effects . . ." (see footnote 4).

<sup>21</sup>A. Bar-Ilan and A. S. Blinder, "Consumer Durables and the Optimality of Usually Doing Nothing," NBER Working Paper No. 2488, January 1988.

<sup>22</sup>B. S. Bernanke and A. S. Blinder, "Credit, Money, and Aggregate Demand" (see footnote 1).

<sup>23</sup>R. B. Barsky and G. Solon, "Real Wages and the Business Cycle," NBER Working Paper No. 2888, March 1989.

<sup>24</sup>R. Cooper, "Optimal Labor Contracts, Imperfect Competition, and Underemployment Equilibria: A Framework for Analysis," NBER Working Paper No. 2060, October 1986, and "Dynamic Behavior of Imperfectly Competitive Economies with Multiple Equilibria," NBER Working Paper No. 2388, September 1987.

<sup>25</sup>K. M. Murphy, A. Shleifer, and R. W. Vishny, "Income Distribution, Market Size, and Industrialization," NBER Working Paper No. 2709, September 1988, and "Industrialization and the Big Push," NBER Working Paper No. 2708, September 1988.

<sup>26</sup>A. B. Abel, "An Analysis of Fiscal Policy under Operative and Inoperative Bequest Motives," NBER Working Paper No. 2298, June 1987; "Operative Gift and Bequest Motives," NBER Reprint No. 1004, March 1988; "The Implications of Insurance for the Efficacy of Fiscal Policy," NBER Working Paper No. 2517, February 1988; and A. B. Abel and L. J. Kotlikoff, "Does the Consumption of Different Age Groups Move Together? A New Nonparametric Test of Intergenerational Altruism," NBER Working Paper No. 2490, January 1988.

large class of discrete and continuous-time models that do not necessarily admit closed-form solutions for asset prices.<sup>27</sup>

Frederic S. Mishkin conducted research on understanding real interest rate behavior and on whether futures market data can be used to understand the behavior of real interest rates. In addition, he has been analyzing the information in the term structure about future interest rate movements and also has been examining what the term structure of interest rates tells us about future inflation, both in the United States and in other OECD countries.<sup>28</sup>

Sanford J. Grossman has developed models of asset pricing in the presence of durable goods and transactions costs. He has shown that small transactions costs cause large reductions in the covariability of consumption changes and asset prices. He analyzed the informational implications of portfolio insurance and showed that there are significant differences between the use of synthetic and real options.<sup>29</sup>

Lars Peter Hansen has focused on the quantitative implications of intertemporal general equilibrium models. He has investigated the relationship between economic fluctuations and asset prices. A rich class of equilibrium models he has studied with Martin S. Eichenbaum implies a direct connection between asset roles and appropriately measured intertemporal marginal rates of substitution of consumers.<sup>30</sup>

Kenneth D. West has been studying the behavior of stock prices. He has shown that the volatility of stock prices is difficult to reconcile with some standard present value models, even if one allows for unit root non-stationarity in stock prices and dividends. At present, however, there is little formal evidence that nonstandard models—based on the idea that investors are influenced by fads—better explain the behavior of stock prices. He is also considering the determinants of inventories and output. Inventory movements do not appear to be driven primarily by movements in demand, either in the United States or in some other major industrialized countries. Inventories in some U.S. indus-

tries that maintain order backlogs provide a possible exception to this generalization.<sup>31</sup>

William Poole has studied the demand for money and related monetary policy issues. According to his work, there is growing evidence that the interest elasticity of the demand for money is in the neighborhood of 0.6 instead of approximately 0.1 as estimated by many studies in the 1970s. If the interest elasticity is as high as 0.6, then a monetary rule involving constant money growth will not be satisfactory in the face of major interest rate changes. Poole has explored alternative rules feeding back from observed changes in velocity and from interest rates. He has also completed a study of capital flows in the U.S. balance of payments in the 1980s.<sup>32</sup>

## Measurement and Data

Robert J. Gordon has recently completed an NBER monograph on durable goods prices.<sup>33</sup> He gathered over 25,000 new price observations for producer and consumer durable goods for 1947–83 from many sources, including the Sears catalog and *Consumer Reports* magazine. The resulting indexes imply that the inflation rate for producers' equipment in the U.S. national accounts was overstated by 3 percent per year during 1947–83, and the inflation rate for consumer durable goods was overstated by about half that amount.

In research with Nathan S. Balke, Gordon has reworked Simon Kuznets's pre-1929 estimates of real GNP and the GNP deflator. Using new methods and additional data sources, they found that the cyclical behavior of real GNP differed from the standard series in individual episodes but retained roughly the same overall volatility. They calculate a substantially lower amplitude of changes in the GNP deflator, though.<sup>34</sup> With Martin N. Baily, Gordon also has studied methods of productivity measurement and has concluded that measurement errors explain less than one-third of the post-1973 U.S. productivity growth slowdown. Gordon also has studied differences in wage and price behavior across countries and historical eras, focus-

<sup>27</sup>K. J. Singleton, "Asset Prices in a Time-Series Model with Disparately Informed Competitive Traders," NBER Working Paper No. 1897, April 1986.

<sup>28</sup>F. S. Mishkin, "Can Futures Market Data Be Used to Understand the Behavior of Real Interest Rates?" NBER Working Paper No. 2400, October 1987, and "Understanding Real Interest Rates," NBER Working Paper No. 2691, August 1988.

<sup>29</sup>S. J. Grossman, "Monetary Dynamics with Proportional Transaction Costs and Fixed Payment Periods," NBER Reprint No. 1172, May 1989.

<sup>30</sup>M. S. Eichenbaum and L. P. Hansen, "Estimating Models with Intertemporal Substitution Using Aggregate Time-Series Data," NBER Working Paper No. 2181, March 1987.

<sup>31</sup>K. D. West, "A Specification Test for Speculative Bubbles," NBER Reprint No. 968, January 1988; "Order Backlogs and Order Smoothing," NBER Working Paper No. 2385, September 1987; and "Evidence from Seven Countries on Whether Inventories Smooth Aggregate Output," NBER Working Paper No. 2664, July 1988.

<sup>32</sup>W. Poole, "Monetary Policy Lessons of Recent Inflation and Disinflation," NBER Working Paper No. 2300, June 1987.

<sup>33</sup>R. J. Gordon, *The Measurement of Durable Goods Prices*, Chicago: University of Chicago Press, forthcoming.

<sup>34</sup>N. S. Balke and R. J. Gordon, "The Estimation of Prewar GNP: Methodology and New Evidence," NBER Working Paper No. 2674, August 1988.

ing on the hysteresis hypothesis in U.S. interwar and European postwar data. Also, in U.S. postwar data, Gordon's new specification of the inflation process casts doubt on the usual view that prices are marked up over wages, suggesting instead that prices and wages evolve independently.<sup>35</sup>

## Macroeconomics and Industrial Organization

R. Glenn Hubbard, Ian Domowitz, and Bruce C. Petersen have studied cyclical movements in markups in U.S. manufacturing industries. Using panel data on prices and markups of oligopolies involved in repeated games, they find that markups in concentrated, homogenous-goods industries are higher than those of unconcentrated counterparts. They also examined data on markups for evidence of price wars and found no greater tendency for price wars to break out in recessions or in booms than in other periods. Finally, extending my recent work in estimating markups directly, Hubbard and his coauthors show that measures of industry concentration, import competition, and unionization are important for explaining markups. In addition, estimated markups fluctuate substantially over the cycle.<sup>36</sup>

Julio J. Rotemberg has studied several aspects of price flexibility. With Garth Saloner, he has examined the rigidity of price-setting by monopolists.<sup>37</sup> Rotemberg and Summers have analyzed the effect of inflexible prices and labor hoarding on the measurement of productivity.<sup>38</sup>

Mark Bills has studied how the cost of labor varies cyclically. He uses data on firms' use of overtime hours, which raises labor costs. He concludes that labor costs fluctuate much more over the cycle than most prices do and that firms absorb much of the difference in variations in markups, which are much higher in recessions than in booms. Bills has developed a model of pricing

behavior by firms that identifies conditions under which these cyclical variations in markups might occur.

## Consumers' Behavior

Consumption appears to be more responsive to current income than predicted by the rational-expectations-permanent-income hypothesis. Marjorie Flavin has studied the implication of the fact that consumers have information about their own well-being that the econometrician is unable to observe. She also has considered the problem of borrowing constraints; her preliminary finding is that even households that are not demonstrably liquidity-constrained exhibit a substantial degree of excess sensitivity to current income. Finally, she uses a microdataset to study the extent to which households use investment in durable goods to optimally allocate their consumption across time.<sup>39</sup>

Albert Ando has worked with large, detailed micro-datasets to estimate responses of household saving to: age of the household; changes in productivity and real wage rates over time; demographic and sociological status of the family; the institutional environment, such as the customary retirement age; and other economic conditions, including the relative prices of important goods and services, such as land.

Mankiw and Campbell have reexamined the time-series evidence on the permanent-income hypothesis and have found a strong role for current income in determining aggregate consumption.<sup>40</sup> In work with Miles S. Kimball, Mankiw has studied departures from Ricardian equivalence caused by the interaction between income taxes and precautionary saving.<sup>41</sup> With David N. Weil, Mankiw found that fluctuations in growth in the adult population can explain most large fluctuations in the real price of housing.<sup>42</sup>

## Macroeconomic Policy

Stanley Fischer has compared the rather different monetary policies and economic performance in the

<sup>35</sup>R. J. Gordon, "Productivity, Wages, and Prices Inside and Outside of Manufacturing in the United States, Japan, and Europe," NBER Reprint No. 970, January 1988; "Wage Gaps and Output Gaps: Is There a Common Story for All of Europe?" NBER Reprint No. 1096, February 1989; and "U.S. Inflation, Labor's Share, and the Natural Rate of Unemployment," NBER Working Paper No. 2585, May 1988.

<sup>36</sup>I. Domowitz, R. G. Hubbard, and B. C. Petersen, "Market Structure and Cyclical Fluctuations in U.S. Manufacturing," NBER Reprint No. 1036, September 1988, and "Oligopoly Supergames: Some Empirical Evidence on Prices and Margins," NBER Reprint No. 1023, June 1988.

<sup>37</sup>J. J. Rotemberg and G. Saloner, "The Relative Rigidity of Monopoly Pricing," NBER Working Paper No. 1943, June 1986.

<sup>38</sup>J. J. Rotemberg and L. H. Summers, "Labor Hoarding, Inflexible Prices, and Procyclical Productivity," NBER Working Paper No. 2591, May 1988.

<sup>39</sup>M. Flavin, "The Excess Smoothness of Consumption: Identification and Interpretation," NBER Working Paper No. 2807, December 1988.

<sup>40</sup>J. Y. Campbell and N. G. Mankiw, "Permanent Income, Current Income, and Consumption," NBER Working Paper No. 2436, November 1987.

<sup>41</sup>M. S. Kimball and N. G. Mankiw, "Precautionary Saving and the Timing of Taxes," NBER Working Paper No. 2680, August 1988.

<sup>42</sup>N. G. Mankiw and D. N. Weil, "The Baby Boom, the Baby Bust, and the Housing Market," NBER Working Paper No. 2794, December 1988.



United States, Japan, and Europe from 1973–86.<sup>43</sup> He and Summers have studied the related question of whether nations should “learn to live with” inflation.<sup>44</sup> Fischer also organizes the Bureau’s Annual Macroeconomics Conference and edits the *NBER Macroeconomics Annual*, which is based on the conference proceedings.

Robert J. Barro has studied the relationship of government spending and budget deficits to national saving and growth.<sup>45</sup>

For Rudiger Dornbusch, credibility of macroeconomic programs has been a chief interest. He has concluded that fully credible stabilization programs do not exist. The interesting question, therefore, is: What factors make programs more or less credible?<sup>46</sup> Dornbusch is also interested in the properties of real exchange rates over extended periods (1820–1989). Trade theory suggests that major structural changes in a country’s external environment should be reflected in predictable changes in the terms of trade.

Herschel I. Grossman continues to focus on positive models of economic policy. In a paper with Suk Jae Noh, Grossman has developed a model of proprietary public finance and has analyzed the interplay between political competition and time consistency in a reputational equilibrium. Grossman also has presented a general analysis of inflation in a reputational equilibrium. In two related papers, coauthored with John Van Huyck, Grossman has analyzed reputational equilibriums in which sovereign debt is interpreted as a contingent claim.<sup>47</sup>

Jerry R. Green has studied the lock-in effects of capital gains taxation and of fixed interest rate mortgages on housing turnover. He also has studied social insurance and demographic uncertainty and contracts and contract renegotiation. This work has direct applications to labor contracts and to the analysis of sticky prices and wages.

<sup>43</sup>S. Fischer, “Rules versus Discretion in Monetary Policy,” *NBER Working Paper No. 2518*, February 1988.

<sup>44</sup>S. Fischer and L. H. Summers, “Should Nations Learn to Live with Inflation?” *NBER Working Paper No. 2815*, January 1989.

<sup>45</sup>R. J. Barro, “Government Spending in a Simple Model of Endogenous Growth,” *NBER Working Paper No. 2588*, May 1988; “The Ricardian Approach to Budget Deficits,” *NBER Working Paper No. 2685*, August 1988; and “A Cross-Country Study of Growth, Saving, and Government,” *NBER Working Paper No. 2855*, February 1989.

<sup>46</sup>R. Dornbusch, “Credibility, Debt, and Unemployment: Ireland’s Failed Stabilization,” *NBER Working Paper No. 2785*, December 1988.

<sup>47</sup>H. I. Grossman and S. J. Noh, “Proprietary Public Finance, Political Competition, and Reputation,” *NBER Working Paper No. 2696*, August 1988; H. I. Grossman, “A Generic Model of Monetary Policy, Inflation, and Reputation,” *NBER Working Paper No. 2239*, May 1987; and H. I. Grossman and J. B. Van Huyck, “Seigniorage, Inflation, and Reputation,” *NBER Reprint No. 828*, March 1987, and “Nominally Denominated Sovereign Debt, Risk Shifting, and Reputation,” *NBER Working Paper No. 2259*, May 1987.

## Research Summaries

### Stock Market Prices

Andrew W. Lo

Since the catastrophic stock market crash of October 1929 and the resulting Great Depression, economists and policymakers have been extremely interested in the behavior of financial asset prices. The Securities Exchange Act of 1934 and the creation of the Securities and Exchange Commission were direct consequences of the turbulent markets of the 1920s, and much subsequent regulatory legislation has been designed to reduce the wild price swings generally associated with “speculative” investors. In the wake of the more recent “October Massacre,” understanding how and why equity prices fluctuate has never been more important. This summary describes some of what my coauthors and I have learned recently about the random nature of stock price movements.

#### The Random Walk

One of the earliest characterizations of rationally determined stock prices is the random walk model, which says that future price changes cannot be predicted from past price changes. First developed from rudimentary economic considerations of “fair games,” the random walk has received broad support from the many early empirical studies confirming the unpredictability of stock returns, generally using daily or monthly returns of individual securities.

However, one of my papers with A. Craig McKinlay shows that the random walk model does not fit aggregate weekly returns during 1962–87.<sup>1</sup> In fact, the weekly returns of a portfolio containing one share of each security traded on the New York and American Stock Exchanges (called an “equally weighted” portfolio) exhibit an autocorrelation of 30 percent, implying that about 10 percent of the variability of next week’s return is explained by this week’s return! An equally weighted portfolio containing only the stocks of “smaller” companies, companies with relative low market values, has an autocorrelation of 42 percent and is as high as 49 percent during 1975–87.

This fact surprises many economists because a violation of the random walk hypothesis necessarily implies that price changes can be forecast to some de-

<sup>1</sup>A. W. Lo and A. C. MacKinlay, “Stock Market Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test,” *NBER Reprint No. 1180*, May 1989.



gree. The existence of these weekly correlations suggests that there are unexploited profit opportunities. Two other facts add to this puzzle: 1) weekly portfolio returns are strongly positively autocorrelated, but the returns to individual securities generally are not; in fact, the average autocorrelation across securities is negative (but insignificant); and 2) the predictability of returns is quite sensitive to the holding period: serial dependence is strong and positive for daily and weekly returns but is virtually zero for returns over a month, a quarter, or a year.

### Lead-Lag Effects, Contrarian Profits, and Size

Since the autocorrelation of portfolio returns is the sum of the individual stocks' autocorrelations and their *cross-autocorrelations* (for example, the correlation of this week's return on stock A with next week's return on stock B), we look to the cross-autocorrelations to explain the fact that portfolio returns are forecastable and individual stock returns are not. MacKinlay and I find that these cross-autocorrelations are strongly positive and exhibit a distinct lead-lag pattern: the returns on "larger" stocks—stocks with larger market values—almost always lead those of "smaller" stocks.<sup>2</sup> That is, this week's returns of large stocks can forecast next week's returns of smaller stocks, but not vice-versa. Since individual stocks are weakly negatively correlated on average, the positive correlation of weekly portfolio returns is *completely* caused by these lead-lag effects.

Such effects are also an important source of the apparent profitability of contrarian investment strategies, strategies that buy "losers" and sell "winners." For example, suppose the market consists of only two stocks, A and B, with returns that are uncorrelated individually but positively cross-correlated. If A's return is higher than the market this week, the contrarian will sell it and buy B. But if A and B are positively cross-autocorrelated, a higher return for A today implies a higher return for B tomorrow (on average). Thus the contrarian investor profits (on average) from buying B. Although A's past returns cannot be used to forecast its future returns, they can be used to forecast B's future returns, and contrarian trading strategies inadvertently benefit from this.

Our results show that at least half of the expected profits from one particular contrarian strategy are the result of lead-lag effects. Economic models attempting to explain the 30 percent autocorrelation in portfolio returns now must do so in a very specific way: they must provide a mechanism by which the returns of smaller companies lag those of larger ones.

Other aspects of the behavior of stock returns also seem to be related to the company's market value or

"size." For example, small stocks are largely responsible for the "January effect," an empirical regularity in which equity returns over the past 25 years have been consistently higher than usual between the last few trading days of December and the first few of January. Also, the returns of small stocks are generally more volatile than those of large stocks. Moreover, for the contrarian trading strategy that MacKinlay and I examine, small stocks tend to yield higher expected profits. These empirical observations probably signal substantial differences between the economic structure of small and large corporations. But how these differences are manifested in the behavior of equity returns cannot be reliably determined through data analysis alone.

In a related context, MacKinlay and I have shown that when empirical facts motivate the search for additional empirical facts in the same data, this can lead to anomalous findings that are more apparent than real.<sup>3</sup> Moreover, the more we scrutinize a collection of data, the more likely we are to find interesting (spurious) patterns. Since stock market prices are perhaps the most studied economic quantities to date, financial economists must be particularly vigilant. The importance of size would be much more convincing if it were based on a model of economic equilibrium in which the relationship between size and the behavior of asset returns is well articulated. I hope to provide such a model in the near future.

### Nonsynchronous Trading

Perhaps the simplest explanation of the predictability in returns is a kind of measurement error to which financial data are particularly susceptible, often called the "infrequent trading" or "nonsynchronous trading" problem. This arises when prices recorded at different times are treated as if they were sampled simultaneously. For example, the daily prices of financial securities quoted in the *Wall Street Journal* are usually "closing" prices, prices at which the last transaction in each of those securities occurred on the previous business day. If the last transaction in stock A occurs at 2 p.m. and the last transaction in stock B occurs at 4 p.m., then included in B's closing price is information not available when A's closing price was set.

This can create spurious predictability in asset returns since economywide shocks will be reflected first in the prices of the most frequently traded securities, with less frequently traded stocks responding with the lag. Even when there is no statistical relationship between stocks A and B, their measured returns will seem cross-autocorrelated simply because we have mistakenly assumed that they are measured simultaneously.

<sup>2</sup>A. W. Lo and A. C. MacKinlay, "When Are Contrarian Profits Due to Stock Market Overreaction?" NBER Working Paper No. 2977, May 1989.

<sup>3</sup>A. W. Lo and A. C. MacKinlay, "Data-Snooping Biases in Tests of Financial Asset Pricing Models," NBER Working Paper No. 3001, June 1989.

MacKinlay and I have constructed an explicit model of this phenomenon that is capable of generating size-determined lead-lag patterns (since small stocks trade less frequently than large stocks do), and positive portfolio correlation in weekly returns.<sup>4</sup> Using this framework, we can estimate the degree of nonsynchronous trading implicit in the observed means, variances, and autocorrelations of the data. With weekly returns, the infrequent trading necessary to produce an autocorrelation of 30 percent is empirically implausible, requiring securities to go for several days without trading on average. Therefore, infrequent trading may be responsible for a portion of the observed autocorrelation, but it cannot explain all of it.

## Long-Term Memory

In contrast to the positive autocorrelation MacKinlay and I find in short-horizon stock returns, others have reported negative serial correlation in longer-horizon (three- to five-year) returns for the longer 1926-87 sample period. This may be a symptom of "long-range dependence" or long memory in asset returns, a kind of dependence often found in natural phenomena. Unlike conventional models of economic time series in which shocks of the remote past have little influence on the distant future, the serial dependence of long-memory time series decays far more slowly. This has profound economic and econometric implications: long-range dependence can change the optimal portfolio mix drastically for any individual and also affects the statistical procedures that we use to learn about asset returns.

To test for long memory in stock returns, I develop a statistic based on Benoit Mandelbrot's "rescaled range," which is robust to the short-horizon serial correlation discussed above.<sup>5</sup> In contrast to an earlier study that claims to have uncovered long memory in the stock market using Mandelbrot's procedure, I show that there is no evidence of long-range dependence in daily, weekly, monthly, or annual returns over various sample periods once short-term correlations are properly taken into account. Joseph G. Haubrich and I have also looked for long-term memory in aggregate output, with much the same results.<sup>6</sup> Although we show that long-range dependence can arise naturally in an equilibrium model of real business cycles, the current empirical evidence is not supportive.

<sup>4</sup>A. W. Lo and A. C. MacKinlay, "An Econometric Analysis of Nonsynchronous Trading," NBER Working Paper No. 2960, May 1989.

<sup>5</sup>A. W. Lo, "Long-Term Memory in Stock Market Prices," NBER Working Paper No. 2984, May 1989.

<sup>6</sup>J. G. Haubrich and A. W. Lo, "The Sources and Nature of Long-Term Memory in the Business Cycle," NBER Working Paper No. 2951, April 1989.

## Directions for Future Research

Perhaps the most pressing fact in need of a theory is that the predictability of stock returns is strongest for weekly holding periods. Several equilibrium models of time-varying expected rates of return already have been proposed as explanations of long-horizon return predictability, but they require unrealistic parameter values to capture weekly variations in stock price changes. Moreover, none of the models is yet able to generate the kind of lead-lag structure exhibited by the data. This suggests the need for innovation in asset pricing paradigms, perhaps by a more explicit modeling of learning behavior, the transmission of information, and the microstructure of financial markets. Although traditionally considered inappropriate for academic scrutiny, subjects such as technical analysis and market psychology may play an important role in future models of rational economic equilibrium in asset markets.

## Consumption and Saving Behavior

Stephen P. Zeldes

To understand business cycle fluctuations, the effects of government deficits, long-run aggregate capital accumulation, and the determination of asset prices, we need to know how households allocate their income between consumption and saving. Much of my research focuses on the effects on consumer spending and saving of imperfections in the consumer credit market that constrain the amount of household borrowing, uncertainty in household income, and changes in the value of the stock market.

## The Importance of Borrowing Constraints

The permanent-income theory of consumption says that the response of consumption to temporary changes in income should be small: households will save the bulk of positive windfalls to income and will run down their assets or borrow to keep consumption smooth in the face of drops in income. This view assumes that households have access to markets in which they can borrow against their future labor income. Yet aggregate U.S. consumption fluctuates more than the permanent-income hypothesis predicts.

Credit markets are imperfect because banks do not have all possible information about loan applicants and cannot enforce loan repayments perfectly. There-

fore, individuals who suffer a substantial drop in earnings cannot borrow large amounts of money with only their future labor earnings as collateral. I derive the theoretical implication of such borrowing constraints and test whether these limits on household borrowing have important effects on spending patterns.<sup>1</sup>

To perform the tests, I use survey data from the Panel Study of Income Dynamics (PSID) on approximately 5000 households followed over 15 years. These data include a detailed breakdown of different types of income, tax information, and information on a component of consumer spending.<sup>2</sup> I split the sample into two groups: those families with few or no liquid assets in a given year, and those with higher liquid assets. I derive and test two implications of the model with borrowing constraints. First, once I take variations in aftertax interest rates into account, changes in consumption should be forecastable for the low-asset group but not for the high-asset group. The second implication begins with the observation that households that are unable to borrow still have the option of saving to smooth out high current income or low anticipated future income. Because of this, households with low current assets that are unable to borrow should have a *higher* expected growth of consumption than the rest of the population.<sup>3</sup> My results generally support the view that borrowing constraints affect the spending patterns of a significant fraction of the U.S. population. Consumption growth is both more predictable and, on average, higher for households that find themselves with few or no liquid assets in a given year.

## Precautionary Saving: The Effects of Income Uncertainty

I also examine the effects on saving of uncertainty about future income—including the risk of becoming unemployed or disabled, or experiencing large increases or decreases in salaries.<sup>4</sup> Previous researchers had shown the conditions under which uncertainty raised the level of saving, but they were unable to determine

the magnitude of the effect.<sup>5</sup> I demonstrate that uncertainty generally will raise the *sensitivity* of consumption to current income. I calculate what the consumption function would be, given empirical estimates of the magnitude of income uncertainty and plausible assumptions about consumers' preferences. Therefore, I am able to calculate the exact size of the effect of income uncertainty on both the level of consumption and the sensitivity of consumption to current income. Four important results have emerged from this line of research.

1. *Precautionary saving is likely to be an important component of household saving.* This is especially true for households whose lifetime resources consist primarily of uncertain future labor income. Thus, one reason for the secular decline in the U.S. saving rate may have been the rise of social insurance programs.<sup>6</sup> In addition, uncertainty about uninsured medical expenses is likely to explain why elderly households spend so little relative to their assets.<sup>7</sup> Currently, I am examining the combined effects of uncertainty about income, length of life, and uninsured health expenses.<sup>8</sup>

2. *Income uncertainty generally increases the sensitivity of consumption to transitory changes in income or wealth.*<sup>9</sup> Previous research, which ignored the effects of income uncertainty, found it puzzling that consumers would respond so significantly to temporary changes in income.<sup>10</sup> I discovered that uncertainty can raise the sensitivity of consumption to income and that the degree of "excess sensitivity" in the data is of ap-

<sup>1</sup>S. P. Zeldes, "Consumption and Liquidity Constraints: An Empirical Investigation," *Journal of Political Economy* 97, 2 (April 1989), and "The Effects of Borrowing Constraints on Consumption in a Multiperiod Model with Income Uncertainty," manuscript, 1987.

<sup>2</sup>The survey asks for the current value of consumption expenditures on food at home and food away from home.

<sup>3</sup>Technically, this observation corresponds to a one-sided inequality in the consumer's intertemporal first-order condition.

<sup>4</sup>S. P. Zeldes, "Optimal Consumption with Stochastic Income: Deviations from Certainty Equivalence," MIT Ph.D. dissertation, 1984, and *Quarterly Journal of Economics* (May 1989).

<sup>5</sup>These authors (for example, H. E. Leland, "Saving and Uncertainty: The Precautionary Demand for Saving," *Quarterly Journal of Economics* 86 [1968], and A. Sandmo, "The Effect of Uncertainty on Saving Decisions," *Review of Economic Studies* 37 [1970]) showed that if the third derivative of the utility function is positive, increased income uncertainty will raise saving. However, they were unable to derive a closed-form analytic solution, and thus the magnitude of this effect was not known. Rather than use analytic techniques, I use numerical methods to closely approximate the solution.

<sup>6</sup>This by no means implies that the programs were not welfare improving. One reasonable interpretation is that the drop in saving, while optimal from each family's standpoint, was a negative side effect of these programs from the point of view of the aggregate economy.

<sup>7</sup>See also L. J. Kotlikoff, "Health Expenditures and Precautionary Savings," NBER Working Paper No. 2008, August 1986, and in *What Determines Savings?* Cambridge, MA: MIT Press, 1989.

<sup>8</sup>I am exploring this in current research with R. Glenn Hubbard and Jonathan S. Skinner.

<sup>9</sup>This presents an alternative to the borrowing-constraints explanation of "excess sensitivity" discussed in the previous section.

<sup>10</sup>R. E. Hall and F. S. Mishkin, "The Sensitivity of Consumption to Transitory Income: Estimates from Panel Data on Households," *Econometrica* 50 (1982).

proximately the same magnitude expected from the amount of income uncertainty facing households.<sup>11</sup>

3. *Household income uncertainty tends to lower the equilibrium interest rate on short-term government ("risk-free") bonds.* Standard theories of asset pricing cannot explain the low level of the observed risk-free rate of interest. These standard theories often imply that high aggregate rates of growth will be associated with high rates of return. In the United States, however, there have been long periods in which consumer spending has grown rapidly despite low or negative real risk-free rates. Asset pricing theories also imply that uncertainty about future income increases the desired growth rate of consumption. I find that the amount of income uncertainty facing the typical household will substantially reduce the equilibrium risk-free interest rate in the economy, thus helping to resolve this "risk-free rate puzzle."

4. *Deficit-financed tax cuts matter.* Some argue that tax cuts financed by deficits don't stimulate consumer spending because consumers realize that their taxes will be raised in the future.<sup>12</sup> In work with Robert B. Barsky and N. Gregory Mankiw, I explain why tax cuts should raise consumer spending, even if individuals fully anticipate higher taxes later on.<sup>13</sup> Since tax revenues increase with income, individuals realize that they or their children will have to pay most of the future taxes only if they have a high future income; if they are less successful financially, the tax burden will fall on others. Thus, there is little incentive to save the money they receive today and consumer spending rises. Therefore, deficit-financed tax cuts are likely to result in higher consumer spending and lower national saving.

## The Stock Market and Consumer Spending

Finance theory stresses the positive relationship between the risk of a particular asset and its expected return. A great deal of research has attempted to define and measure the "riskiness" of an asset or portfolio of assets. One measure of the riskiness of a particular stock or bond compares the covariance of its return

with the growth in aggregate consumption. Under this measure, a stock is more risky if its return tends to be high when aggregate consumption is high and low when aggregate consumption is low. This "consumption beta" measure has strong theoretical underpinnings, but empirical tests have provided little support for the theory.

One possible problem with the tests performed thus far is that they assume that all individuals have easy and inexpensive access to the equity markets, and therefore that all individuals hold stock. The measure of consumption used in tests of the theory is therefore aggregate spending of the U.S. population. Yet non-stockholders comprise an important part of all consumers. If consumption patterns differ between stockholders and nonstockholders, estimating a model with aggregate time-series data is likely to give misleading results.

In recent work with Mankiw, I use data from the PSID to examine such differences.<sup>14</sup> We use 17 years of extensive data on a representative sample of approximately 5000 families, including data on the size and allocation of each family's wealth. We find that:

1. *Only a small fraction of the population holds stock, either directly or through defined-contribution pension plans.* In 1984, only 28 percent of U.S. households held any of their wealth directly in the stock market and only a small number held defined-contribution pension wealth in the stock market. The consumption of non-stockholders comprises a significant fraction of aggregate consumption.

2. *The prevalence of stock ownership is strongly (positively) related to both the labor earnings and the education level of the household.*

3. *The consumption of stockholders differs from that of nonstockholders.* This suggests that disaggregating the data could improve the performance of a variety of consumption-based asset pricing models.

4. *The growth of consumption of stockholders is slightly more volatile and has a significantly higher correlation with the stock market than that of non-stockholders.* The riskiness of the stock market cannot explain the large difference between the average return on U.S. stocks and Treasury bills (the "equity premium"). Intuitively, if the random movements in stock returns are not associated with large changes in consumption, then the randomness does not represent true riskiness to the consumer and therefore should not require a very large risk premium. Our results show that the covariance of consumption growth with the excess return on the market is four to seven times higher for stockholders than for nonstockholders. Thus, separately examining the consumption of stockholders and

<sup>11</sup>I found this "excess sensitivity" result for constant relative risk aversion utility functions. In work subsequent to my original finding, Roell ("Capital Market Imperfections and the Excess Sensitivity of Consumption to Transitory Income," manuscript, 1986) and Kimball ("Precautionary Saving and the Marginal Propensity to Consume," manuscript, 1988) have verified this excess sensitivity result analytically and have shown which properties of the utility function lead to this effect. However, they are unable to calculate the magnitude of the effect. The numerical results discussed in the text calculate both the direction and the magnitude of this effect.

<sup>12</sup>R. J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy* (1974), and "The Ricardian Approach to Budget Deficits," *Journal of Economic Perspectives* (1989).

<sup>13</sup>R. Barsky, N. G. Mankiw, and S. P. Zeldes, "Ricardian Consumers with Keynesian Propensities," NBER Reprint No. 821, February 1987, and *American Economic Review* 76, 4 (September 1986).

<sup>14</sup>N. G. Mankiw and S. P. Zeldes, "The Consumption of Stockholders and Nonstockholders," NBER Working Paper, forthcoming 1989.

nonstockholders helps explain this equity premium puzzle.

## Future Research

My research has raised a number of questions that merit additional investigation. First, I am exploring how the interaction of three important sources of uncertainty (earnings, health expenses, length of life) influences aggregate saving. Second, now that theoretical models have been developed showing the potential importance of precautionary saving, econometric techniques need to be used to estimate the size of precautionary saving in household and aggregate data. Third, further research is needed to explain why certain wealthy households do not own stock in their portfolios. Finally, I am trying to figure out ways of combining the microdata with aggregate data to create a proxy for the consumption of stockholders, so that the relationship between stockholder consumption and the return on the market can be examined using a longer historical time series.

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# Economic Outlook Survey

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## Second Quarter 1989

Victor Zarnowitz

According to the June survey of 17 professional forecasters taken by the NBER and the American Statistical Association, real GNP is expected to grow 2.9 percent this year and 1.8 percent in 1990. Inflation as measured by the consumer price index (CPI) is forecast to fall from 5.5 percent (annual rate) in 1989:2 to 4.9 percent in 1990:2.

Short-term interest rates are predicted to average 7.5 percent in 1990, down from about 8.5 percent now, while the forecasters believe that long-term rates will change little. The growth and inflation forecasts represent small upward revisions, and the interest rate forecasts represent small downward revisions, compared with the levels specified by the group three months ago.

## High Degree of Consensus That a Slowdown Is Developing

Of the five median forecasts of the annual growth rates in the economy's output for 1989:2-1990:2, the highest is 2.2 percent (1990:1), while the others fall in the range of 1.1-1.6 percent. Two of the 17 respondents predict declines in real GNP for two successive quarters between 1989:4 and 1990:2; two others predict single-quarter declines. Among the 85 forecasts of quarter-to-quarter real GNP change, six are negative and 19 are positive but less than 1 percent.

The annual forecasts still indicate a substantial slowdown rather than a recession. The range of the individual predictions for 1988-9 is 2.5-4.1 percent; the mean is 3.0 percent; the standard deviation is 0.5 percent. The corresponding statistics for 1989-90 are 0.5-4.0 percent, 1.8 percent, and 1.0 percent, respectively. All but three of the respondents anticipate reductions in growth next year, but none sees an actual decline on an annual basis.

Forecasters are asked regularly what probabilities they attach to an array of possible relative changes in national output. The distribution of the resulting means confirms the prevalent expectation that a slowdown is underway:

<i>Percentage Change in Real GNP</i>	<i>1988-9</i>	<i>1989-90</i>
4.0 percent or more	8	4
2.0-3.9 percent	70	39
0-1.9 percent	18	44
Negative	4	13

## No Serious Deterioration in Outlook for Recession and Unemployment

There is no significant change from the previous survey in the estimated probabilities that national output will decline. The means based on the individual probability distributions double from 14 percent for 1989:2 to 28 percent for 1990:2. Most forecasters think the chances of a recession are not very high, but a few believe otherwise.

The prevailing expectation is that the unemployment rate will increase only moderately. The medians (and means) are 5.6 percent in 1990:2 and 5.7 percent in 1990, with standard deviations of four-tenths of one percentage point. The corresponding highest forecasts are 6.3 percent and 6.5 percent.

## Uncertain Forecasts of Flat or Lower Inflation

The GNP implicit price deflator (IPD) is predicted to rise 4.7 percent in 1988-9, 4.6 percent in 1989:2-1990:2, and 4.4 percent in 1989-90. The group's forecasts of CPI inflation are 5.1 percent for both 1989 and 1990, up from 4.1 percent in 1988 but down from the 5.5 percent estimate for 1989:2. More respondents predict lower inflation in 1990 than in 1989 than those who predict the reverse. The same applies to the comparisons between 1989:2 and 1990:2, but the majorities and the differentials are not large.

## Projections of GNP and Other Economic Indicators, 1989-90

	Annual				
	1988 Actual	1989 Forecast	1990 Forecast	Percent Change	
				1988 to 1989	1989 to 1990
1. Gross National Product (\$ billions)	4864.3	5235.0	5570.0	7.6	6.4
2. GNP Implicit Price Deflator (1982 = 100)	121.7	127.4	133.0	4.7	4.4
3. GNP in Constant Dollars (billions of 1982 dollars)	3996.1	4111.0	4184.0	2.9	1.8
4. Unemployment Rate (percent)	5.5	5.3	5.7	-0.2 <sup>1</sup>	0.4 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	163.9	174.5	178.0	6.5	2.0
6. Nonresidential Fixed Investment (billions of 1982 dollars)	487.5	510.0	525.5	4.6	3.0
7. New Private Housing Units Started (annual rate, millions)	1.49	1.44	1.48	-3.02 <sup>2</sup>	2.42 <sup>2</sup>
8. Change in Business Inventories (billions of 1982 dollars)	42.5	41.0	27.5	-1.5 <sup>3</sup>	-13.5 <sup>3</sup>
9. Treasury Bill Rate (3-month, percent)	6.67	8.45	7.50	1.78 <sup>1</sup>	-0.95 <sup>1</sup>
10. Consumer Price Index (annual rate)	4.1	5.1	5.1	1.0 <sup>1</sup>	0.0 <sup>1</sup>

	Quarterly						Percent Change	
	1989 Q1 Actual	Q2	1989 Q3	Q4	1990 Q1	Q2	Q1 89 to Q1 90	Q2 89 to Q2 90
	Forecast							
1. Gross National Product (\$ billions)	5116.8	5198.0	5276.0	5349.0	5430.0	5512.5	6.1	6.1
2. GNP Implicit Price Deflator (1982 = 100)	125.2	126.7	128.1	129.4	131.0	132.5	4.6	4.6
3. GNP in Constant Dollars (billions of 1982 dollars)	4088.2	4102.6	4119.0	4130.7	4153.0	4165.6	1.6	1.5
4. Unemployment Rate (percent)	5.2	5.3	5.4	5.5	5.6	5.6	0.4 <sup>1</sup>	0.3 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	175.8	176.0	175.5	175.0	173.4	174.0	-1.3	-1.1
6. Nonresidential Fixed Investment (billions of 1982 dollars)	502.8	510.9	515.3	518.6	519.5	520.0	3.3	1.8
7. New Private Housing Units Started (annual rate, millions)	1.52	1.44	1.42	1.42	1.44	1.47	-5.26 <sup>2</sup>	2.08 <sup>2</sup>
8. Change in Business Inventories (billions of 1982 dollars)	53.8	44.0	36.0	30.0	30.0	28.4	-23.8 <sup>3</sup>	-15.6 <sup>3</sup>
9. Treasury Bill Rate (3-month, percent)	8.53	8.52	8.50	8.25	8.00	7.65	-0.53 <sup>1</sup>	-0.87 <sup>1</sup>
10. Consumer Price Index (annual rate)	4.7	5.5	5.0	5.0	5.0	4.9	0.3 <sup>1</sup>	-0.6 <sup>1</sup>

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

<sup>1</sup>Change in rate, in percentage points.

<sup>2</sup>Possible discrepancies in percentage changes are caused by rounding.

<sup>3</sup>Change in billions of dollars.

However, most forecasters are quite uncertain about whether inflation will moderate or stay at about the same level next year. The mean probability distributions of relative changes in IPD naturally show a greater dispersion in the predictions for 1990 than 1989, but they give no indication of a change in the implied expected values (which are close to 5 percent for both years).

Percentage Change in IPD	1988-9	1989-90
8 percent or more	2	4
6.0-7.9 percent	11	15
4.0-5.9 percent	71	61
Less than 4.0 percent	16	20

### Lower Interest Rates Expected Next Year

The medians from the survey predict that the three-month Treasury bill rate will stay close to 8.5 percent through the summer of 1989, then decline gradually to 8 percent in early 1990, 7.6 percent and less later next year. Most respondents expect the bill rate to be lower in 1990:2 than in 1989:2, and all but two expect it to be lower on average in 1990 than in 1989. Forecasts of the bill rate for 1990:2 range between 7 percent and 11.5 percent.

The median forecasts of the yield on new high-grade corporate bonds stay near 9.9 percent in each of the five quarters, 1989:2-1990:2, but the corresponding

mean forecasts creep up from 10 percent to 10.5 percent. However, the annual averages decline slightly between 1989 and 1990.

### **Crosscurrents in Consumption and Investment**

The slowdown is expected to affect most major expenditure components of real GNP but with different intensities and timing, which should mitigate its overall impact. Consumption will grow 2.4 percent in 1988-9, 1.7 percent in 1989:2-1990:2, and 1.9 percent in 1989-90, according to the group's median projections. Its near-future weakness is predicted to be followed by improvement after 1990:1. By contrast, nonresidential fixed investment is expected to gain 4.5 percent in 1988-9, 1.8 percent in 1989:2-1990:2, and 3.0 percent in 1989-90. There is still great strength this year, despite a slide from very high to moderate growth rates. An ebb in business investment to less than 1.0 percent (annual rate) is forecast to occur in the first half on 1990.

The survey averages indicate that residential fixed investment will stagnate or decline for most of 1989 but will improve a little in 1990. New private housing starts will lose 3 percent in 1988-9, gain 2.1 percent in 1989:2-1990:2, and 2.4 percent in 1989-90.

The group's forecasts for the change in business inventories, in billions of 1982 dollars, are 41 for 1989 and 28 for 1990. (The first figure is considerably higher than its counterpart in the March survey; the second is unchanged.)

### **Industrial Production and Profits Weaker, Trade Deficit Smaller**

Forecasters predict the output of manufacturing, mining, and utilities to rise 3.5 percent in 1988-9, 0.8 percent in 1989:2-1990:2, and 1.5 percent in 1989-90. Corporate profits after taxes in current dollars are expected to show much larger swings but a similar pattern of timing: 6.5 percent in 1988-9, -1.1 percent in 1989:2-1990:2, and 2.0 percent in 1989-90.

The trade deficit in real terms, as reflected in net exports of goods and services in billions of 1982 dollars, will average -88 in 1989 and -77 in 1990, according to the median forecasts. This represents a smaller reduction than was achieved in the recent past (the figure for 1988 was -129). It is also smaller than was expected in the March survey (-70 for 1990).

### **Government Purchases and Policy Assumptions**

Federal government purchases of goods and services in constant dollars are expected to rise 1.9 percent in 1988-9 and to decline 0.9 percent in 1989-90. For state and local government purchases, the respective median forecasts are 3.2 percent and 2.0 percent.

Thirteen forecasters have assumed no significant changes in tax policy; a few others anticipate some tax increases. Most respondents see no change or small declines in defense outlays; only five quote changes outside of the range of -2 to +2 percent.

The few reported assumptions about monetary growth rates vary between 2 percent and 6 percent for 1989 and between 3 percent and 7 percent for 1990.

Five respondents assume that energy demand will rise 1-3 percent; one forecaster assumes that it will be stable. Six see oil per-barrel prices in the \$15-19 range, four in the \$20-25 range; three specify price increases of 5-7 percent, two of 10-18 percent.

The views on the dollar are divided. Two panelists see stability, six more strength, and five a renewed decline. This is reflected in a diversity of predictions on exports and imports.

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

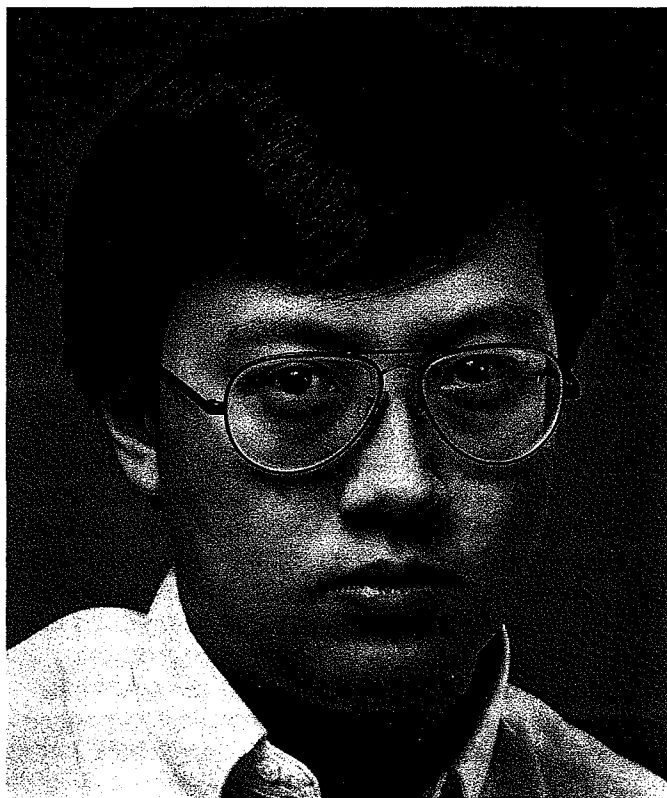
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## **NBER Profiles**

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### **Andrew W. Lo**

Andrew Lo is a faculty research fellow in the NBER's Program in Financial Markets and Monetary Econom-





ics and a 1988-9 NBER Olin Fellow. Lo received his B.A. in economics from Yale University in 1980 and his Ph.D. from Harvard University in 1984.

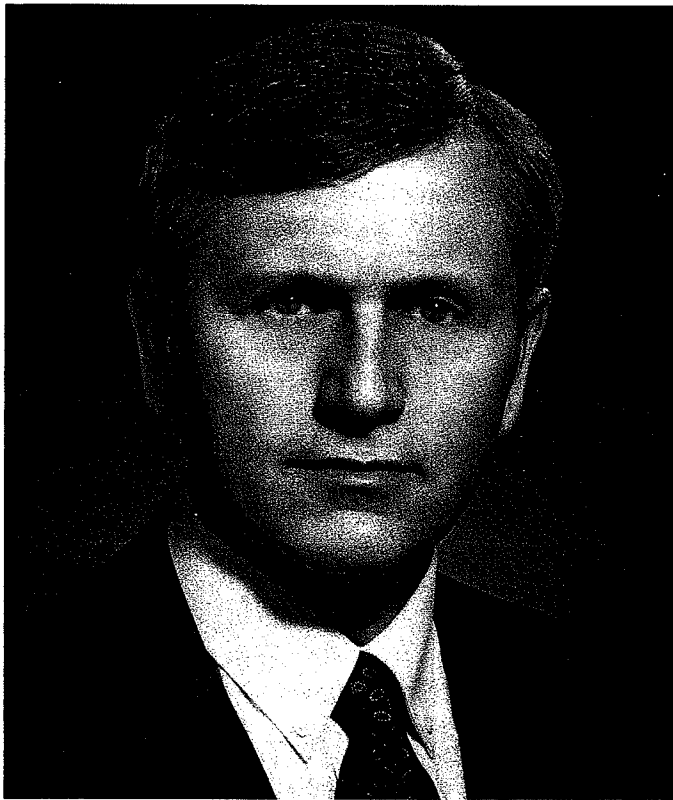
He was an assistant professor of finance at the Wharton School (University of Pennsylvania) from 1984 to 1987, when he was promoted to associate professor. He is currently an associate professor of finance at MIT's Sloan School of Management.

Lo specializes in financial economics and econometrics. He is a recipient of the Batterymarch Fellowship (1989-90) and was given the American Association of Individual Investors Award for his paper with A. Craig MacKinlay on contrarian profits and stock market overreaction (NBER Working Paper No. 2977).

Lo is a science fiction buff, plays the piano, and avoids strenuous exercise. He lives in Lexington with his wife Nancy and their pet computer, Colossus.

## Robert T. Parry

Robert T. Parry, president and chief executive of the Federal Reserve Bank of San Francisco since 1986, has been an NBER director since 1985.



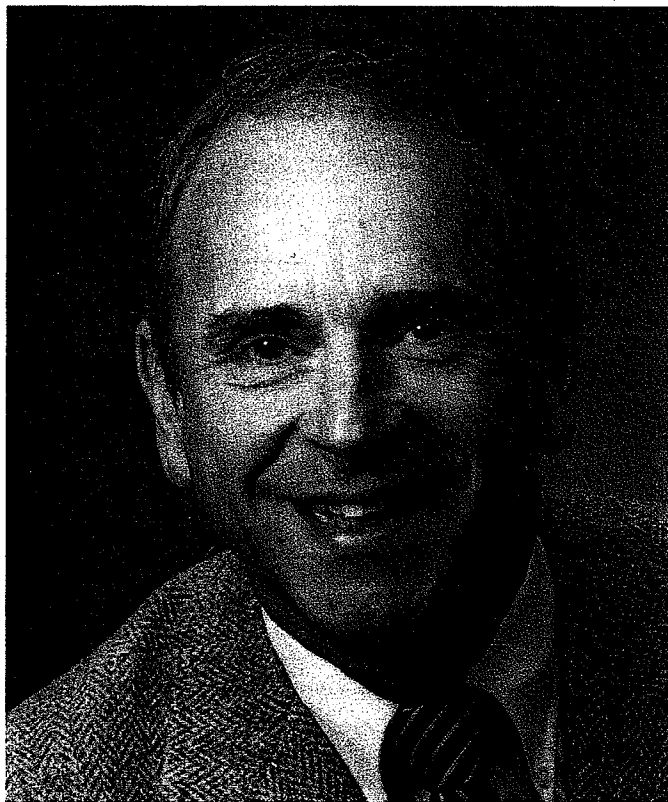
Parry was born in Harrisburg, PA. He received a B.A. from Gettysburg College in 1960, and an M.A. (1961) and Ph.D. in economics (1967) from the University of Pennsylvania.

Parry joined the Board of Governors of the Federal Reserve System as a research economist in 1965 and served at the Board until 1970. Before that, he was an assistant professor of economics with the Philadelphia College of Textiles and Science.

In 1970, he joined Security Pacific National Bank as a vice president. Parry became chief economist in 1973, was promoted to senior vice president in 1976, and to executive vice president and chief economist of Security Pacific Corporation and its principal subsidiary, Security Pacific National Bank, in 1981. Parry is a former director of the California Bankers Association and past president of the National Association of Business Economists. He and his wife Brenda have two grown children. His hobbies are skiing, reading, and traveling.

## Burton A. Weisbrod

Burton A. Weisbrod, the Evjue-Bascom Professor of Economics at the University of Wisconsin-Madison,



has been a member of the NBER's Board of Directors since 1979. Weisbrod received his B.S. in management from the University of Illinois and his M.S. and Ph.D. in economics from Northwestern University. He is founder and director of the University of Wisconsin Center for Health Economics and Law.

A former senior staff economist at the President's Council of Economic Advisers, Weisbrod has been a visiting professor at Princeton, Yale, Harvard, and Brandeis Universities. His past activities include member-

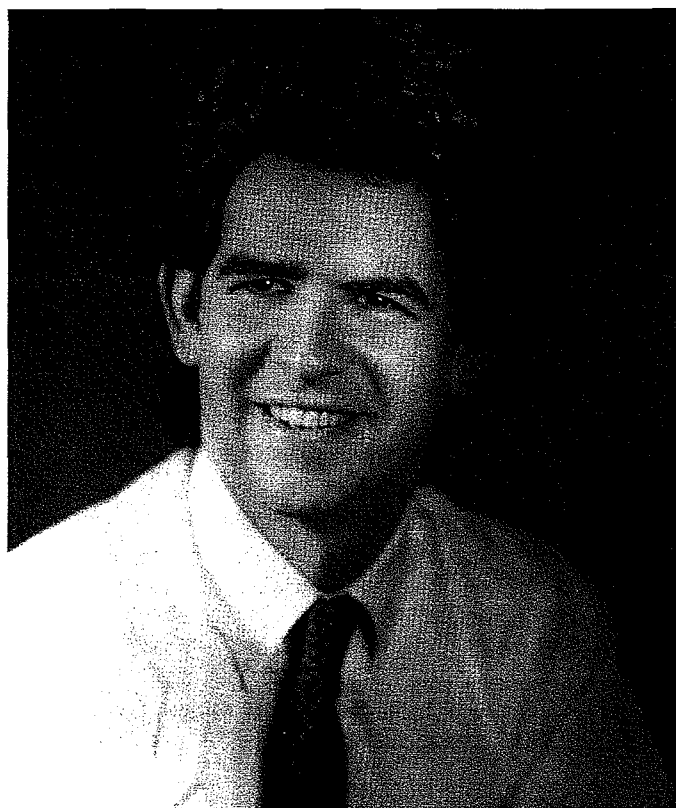
ship on the Governing Council of the National Academy of Sciences Institute of Medicine, and on the Executive Committee of the American Economic Association. He also has been president of the Midwest Economics Association.

Weisbrod has written over one hundred articles and a dozen books, the most recent being *The Nonprofit Economy*, Harvard University Press, 1988. His two principal areas of research are health economics and the comparative behavior of for-profit, governmental, and private nonprofit organizations.

Weisbrod and his wife Shirley have two children and two grandchildren.

## Stephen P. Zeldes

Stephen Zeldes is a faculty research fellow in the NBER's Program in Financial Markets and Monetary Economics and a 1988-9 NBER Olin Fellow. He received a B.S. in economics and applied mathematics from Brown University in 1978 and a Ph.D. in economics from MIT in 1984.



Since 1984, Zeldes has been an assistant professor of finance at the Wharton School, University of Pennsylvania. From 1978-80 he was a research associate at the Federal Reserve Bank of San Francisco. His research has been published in the *American Economic Review* and other leading journals.

Zeldes enjoys swimming and photography in his leisure time. He is single.

## Conferences

### InterAmerican Seminar on Economics

The NBER's Second Annual InterAmerican Seminar on Economics, cosponsored by the Pontificia Universidade Catolica do Rio de Janeiro (PUC) and FEDESARROLLO, was held in Bogota, Colombia, on March 30-April 1. Sebastian Edwards, NBER and University of California at Los Angeles, and Edmar Bacha, PUC-Rio de Janeiro, organized the following program:

Opening Remarks: Luis Fernando Alarcon, Minister of Finance, Colombia

Rudiger Dornbusch, NBER and MIT, and Sebastian Edwards, "Economic Crises and the Macroeconomics of Populism in Latin America: Lessons from Chile and Peru" (NBER Working Paper No. 2986)

Discussants: Jose Pablo Arellano, CIEPLAN, and Antonio Urdinola, ECLAC-Bogota

Edmar Bacha, "A Three-Gap Model of Foreign Transfers and the GDP Growth in Developing Countries"

Discussants: Leonardo Villar, FEDESARROLLO, and Daniel Heyman, ECLAS-Argentina

Raquel Fernandez, NBER and Boston University, and Jacob Glazer, Boston University, "The Scope for Collusive Behavior among Debtors in a Model of Sovereign-Debt Renegotiation with Costly Penalties"

Discussant: Mauricio Cabrera, former Head of Public Credit, Colombia

Eduardo Borensztein, International Monetary Fund, "Debt Overhang, Credit Rationing, and Investment"

Discussants: Patricia Correa, Banco de la Republica, and Juan Jose Echavarria, FEDESARROLLO

Armando Montenegro, Advisor to the Monetary Board, Colombia, "The Economics of a Regulated Export Sector: Coffee in Colombia"

Discussants: Roberto Steiner, Banco de la Republica, and Vinod Thomas, The World Bank

Edward E. Leamer, NBER and University of California at Los Angeles, "Latin America as a Target of Trade Barriers Erected by the Major Developed Countries in 1983"

Discussant: Gustavo H. B. Franco, PUC-Rio de Janeiro

Jose Antonio Ocampo, FEDESARROLLO, "Import Controls, Prices, and Economic Activity in Colombia"

Discussants: Anne O. Krueger, NBER and Duke University, and Ricardo Chica, FEDESARROLLO and Universidad de los Andes

Salvador Valdes, Universidad Catolica de Chile, "Export Drawbacks and Vertical Control"

Discussant: Alicia Puyana, CRESET

Aaron Tornell, Columbia University, "Real versus Financial Investment: Can Tobin Taxes Eliminate the Irreversibility Distortion?"

Discussant: Andres Velasco, Columbia University

Winston Fritsch and Gustavo H. B. Franco, PUC-Rio de Janeiro, "Direct Foreign Investment and Industrial Restructuring in Brazil"

Discussant: Astrid Martinez, Universidad Nacional de Colombia

J. Saul Lizondo, Universidad de Tucuman, Argentina, and Peter Montiel, International Monetary Fund, "Dynamics of Devaluation and Equivalent Fiscal Policies for a Small Country with Optimizing Agents"

Discussants: Manuel Ramirez, Universidad de los Andes, and Alberto Carrasquilla, Banco de la Republica

Raul Ramos, Banco de Mexico, "Real Wages and the Transfer Problem: A Mexican Variation on an Old Theme"

Discussants: Geoffrey Carliner, NBER, and Alvaro Reyes, CCRP

Alarcon began the meetings with a review of Latin America's debt problems. He emphasized that the problem was created jointly by foreign banks, creditor governments, and debtor governments. Since the onset of the crisis in 1982, most debtor countries have endured very stringent economic conditions. Alarcon suggested that a successful solution to the debt problem probably would also be a joint undertaking, including new credit provided by the IMF and The World Bank, regulatory accommodation by creditor governments, and responsible macroeconomic policies by debtor governments.

Dornbusch and Edwards first discuss the main characteristics of populist regimes in Latin America, emphasizing their reliance on macroeconomic policies to redistribute income. Then they define four phases historically observed in most populist experiments, including Chile in 1970-3 and Peru under Alan Garcia now. The first is characterized by demand-driven expansion of output. Pressures on inflation are dealt with through generalized price controls. In the second stage, bottlenecks appear and inflation increases significantly. The third phase is characterized by pervasive shortages, very high inflation, capital flight, and real wages that are significantly below their initial level. At this point, some timid and ineffective stabilization programs usually are tried. During the fourth phase, a new government tries to implement an orthodox stabilization program.

Bacha expands the traditional model of growth to include the fiscal gap as a third constraint on the growth of highly invested developing countries. This requires the assumptions that domestic capital markets for government bonds are very limited and that there is a strong complementarity in these countries between invest-

ment in private sector infrastructure and investment in the private sector. Bacha also studies the impact of net foreign transfers on economic growth and the price stability of fiscally constrained economies. Finally, he discusses the role of external conditionality accompanying debt relief measures.

Fernandez and Glazer examine the possibility of collusive behavior among countries negotiating their debts with the same bank. If the bank and the countries take turns making offers over time, a country will be motivated to reach an agreement if the bank imposes a penalty (restriction of trade credits) in each period in which an agreement is not reached. However, punishing a country is also costly to the bank. If countries are able to commit to a cartel, they can exploit the fact that penalizing two countries simultaneously is costlier to the bank than penalizing them one at a time. Thus, each country pays less than if it were the sole country negotiating with the bank. However, there is a unique equilibrium in which the bank is able to exploit each country's fear that the other country will reach an earlier agreement with the bank; this permits the bank to extract the same payment from each country as it would if there were only one country or if its cost function were linear.

Borensztein assesses the relative magnitude of two mechanisms through which foreign debt decreases productive investment: the debt overhang and credit rationing. The debt overhang acts as a "tax" on production, while rationing implies higher domestic interest rates. However, the effect of credit rationing may be more powerful. This implies that additional lending would be a stronger (or cheaper) policy instrument than debt reductions from the point of view of increasing productive investment in debtor economies.

Montenegro presents a simple model of the Colombian coffee economy within the institutional framework established by the International Coffee Agreement. The real and financial aspects of coffee are specified separately, and Montenegro studies the handling of policy instruments. He also analyzes the conditions for the sector's stability and its static comparative properties. Finally, he explores the behavior of the Colombian coffee economy within organizational frameworks different from the International Coffee Agreement: that is, perfect competition and monopolistic competition.

According to a dataset collected by UNCTAD, Latin American exports are not subject to trade barriers as often as the exports of other regions, such as Australia/New Zealand and Japan. Leamer controls for differences in commodities to estimate the effects of trade barriers on Latin American exports. The two methods he uses lead to quite different results. For example, he finds that exports from Brazil, when compared to 14 imports, are suppressed by trade barriers either by 12 or by 46 percent. The larger estimate comes from accounting more accurately for differences in comparative advantage among the countries he considers.

Ocampo analyzes the effects of changes in Colombia's trade regime since 1976: substantial liberalization during 1976-81, then high restrictions from 1982

to 1985, and finally moderate liberalization since 1985. In his simple Keynesian model, GDP in the manufacturing and service sectors is determined by real aggregate demand, and domestic markets for traded goods are imperfectly competitive. Ocampo estimates that tighter restrictions on imports raised GDP by 4.4 percent between 1982:4 and 1985:2, while liberalization reduced GDP by 1 percent during the remainder of 1985. Since then, liberalization has had very small effects on output.

Valdes studies the export drawback regime that has been in force in Chile and the changes it has suffered lately. Export drawbacks refund value-added and excise taxes on Chilean imports. Valdes finds that the operating rules attached to the new drawback regime can lead to an increase in national welfare. However, this increase is limited because the detailed operating rules in effect limit the refunds to large monopolistic producers who sell to exporters. Small producers and exporters themselves are not able to obtain the refunds. Thus all of the benefits of this export scheme accrue to large monopolists.

In the recent past, several countries have failed to achieve significant real capital investment despite episodes of large capital inflows. Although real projects with seemingly high returns are available, investors prefer to wait for the correct time to invest. Tornell addresses this issue by considering a two-sector economy where investment in real capital is irreversible and financed by debt. Furthermore, the interest rate, which is determined in the financial sector, is random because of volatile expectations. In this economy the expected return on real capital is above the expected interest rate. This is because the option to wait for lower interest rates has a positive value. In the presence of rumors, taxes on international financial transactions (Tobin taxes) reduce the variance of the domestic interest rate, while leaving its mean unchanged. As a result, they induce more investment in irreversible real capital.

Fritsch and Franco review recent industrial policies in Brazil. They first explain how differential access to the technology can determine the northern NICs' patterns of trade in manufactures. They then address three issues: 1) the implications of shortening product cycles; 2) feasible levels of vertical integration; and 3) combinations of firm size and foreign participation that could enhance technology acquisition.

Lizondo and Montiel examine the effects of a nominal exchange rate devaluation, a temporary tax increase, and temporary reductions in government spending on traded and nontraded goods. They find that devaluations and temporary increases in taxes reduce private sector expenditure possibilities when compared with temporary reductions in public sector expenditure. Additional interest earnings transferred to the private sector increase its expenditure possibilities when compared with additional earnings used to increase public sector expenditure. In all cases, the implications for the real exchange rate and for the various accounts of the balance of payments depend on whether the changes in

public sector expenditures take place in traded or in nontraded goods.

Ramos briefly summarizes changes in the Mexican economy since the onset of the debt crisis. Transfers to the rest of the world have averaged 6 percent of GDP annually. To finance these transfers, the real minimum wage fell 47 percent and the share of wages in GDP fell from 38 to 28 percent between 1981 and 1986. Government spending on everything but interest payments fell from 36 percent of GDP in 1982 to 25 percent in 1987. However, tax revenues remained stable at 10–11 percent of GDP. Ramos analyzes these changes with a two-good model in which the government raises revenues through taxes on labor and income and an inflation tax. In this model, the inflation tax depresses new investment. As the labor force grows more rapidly than the capital stock, real wages fall.

## Conference on Social Insurance

Over 70 economists from the United States, Canada, and other countries gathered in Cambridge on April 28–9 for an NBER–Universities Research Conference on "Social Insurance." Research Associate B. Douglas Bernheim of Northwestern University organized the following program:

Jack Carr and Frank Mathewson, University of Toronto, "The Effect of Deposit Insurance on Financial Institutions"

Discussants: Lawrence Benveniste, Northwestern University, and Anjan Thakor, Indiana University  
Bruce D. Meyer, NBER and Northwestern University, "An Event Study Approach to the Effects of Unemployment Insurance"

Discussants: Walter Nicholson, Amherst College, and Gary Solon, University of Michigan

Patricia M. Danzon, University of Pennsylvania, "Mandated Employment-Based Health Insurance: Incidence and Efficiency Effects"

Discussants: Georges Dionne, University of Montreal, and Mark Schlesinger, Harvard University

Donald Cox, Boston College, and George H. Jakubson, Cornell University, "The Connection between Public Transfers and Private Interfamily Transfers"

Discussants: Paul Menchik, Michigan State University, and James Andreoni, University of Wisconsin

Philip de Jong, University of Leiden; Robert H. Haveman, University of Wisconsin; and Barbara Wolfe, NBER and University of Wisconsin, "Labor and Transfer Incomes and Older Women's Work: Estimates from the United States" (NBER Working Paper No.2728)

Discussants: David Card, NBER and Princeton University, and Joseph Quinn, Boston College

Donald O. Parsons, Ohio State University, "Social Insurance and Imperfect State Verification"

Discussants: Rebecca M. Blank, NBER and Princeton University, and Eytan Sheshinski, Hebrew University

Alan B. Krueger, NBER and Princeton University, and Jorn-Steffen Pischke, Princeton University, "The Effect of Social Security on Labor Supply: A Cohort Analysis of the Notch Generation"

Discussants: Marjorie Honig, Hunter College, and Wayne Vroman, The Urban Institute

David Altig, Indiana University, and Steve J. Davis, University of Chicago and Stanford University, "Altruism, Borrowing Constraints, and Social Security"

Discussants: Andrew B. Abel, NBER and University of Pennsylvania, and James Davies, University of Western Ontario

Carr and Mathewson examine the impact of deposit insurance on the financial structure of deposit-taking firms. Using Canadian data on financial intermediaries after the introduction of deposit insurance in 1967, Carr and Mathewson find that average debt-to-equity ratios rise substantially for those classes of firms in which entry is greatest. In Canada, firm failures have increased; most of those failing were incorporated after 1967. Carr and Mathewson believe that deposit insurance serves private and not public interests.

Meyer uses data from five states during 1979–84 to estimate the effects of higher unemployment insurance benefits on the duration of unemployment and on wages in the next job. Sixteen increases in benefits, averaging about 9 percent, increased the length of unemployment spells by about one-and-one-half weeks. The post-unemployment earnings of individuals seemed to fall slightly, but Meyer's estimates are not precise. Individuals who expected to be recalled by a previous employer had larger increases in the number of weeks of unemployment when benefits rose than other unemployed workers.

Mandatory employment-based (MEB) health insurance coverage for all workers is being considered by state and federal governments, and has recently been enacted in Massachusetts. According to Danzon, mandating coverage of all full-time employed workers and their dependents would cover 51 percent of the currently uninsured, for a net new public cost of \$0.8 billion in tax expenditures. By contrast, a program that covers all the uninsured poor and near poor through Medicaid or a catastrophic program would cover 53 percent of the uninsured but would cost \$7.8 billion. The reason for this tremendous differential is that most costs are borne by individuals under the first plan, while the federal government pays for the bulk of the second plan. Danzon suggests that MEB would shift some costs from small to large firms. Costs within firms also would shift

between high- and low-risk individuals and between families and individuals.

Cox and Jakubson ask if public transfers displace transfers provided by family members and friends (private transfers). Using 1979 data collected by the President's Commission on Pension Policy for over 4000 families, Cox and Jakubson simulate a model that eliminates public transfers. They find that only a small portion of the lost family income would be replaced by private transfers.

De Jong, Haveman, and Wolfe estimate the effects of available disability transfer income on the decisions of older women about whether to work. They find that a 40 percent increase in the prospective level of total government disability transfer payments—including Social Security Disability Insurance (SSDI)—would produce only a 5 percent decrease in the labor force participation of older married women and a 13 percent decrease for older female heads of households. Since SSDI benefits are about 40 percent of total disability transfers, they would have to double to produce this same impact on the labor force participation of older women. Therefore, the actual increases in SSDI benefits since the 1960s have only slightly decreased the number of older women who work outside the home.

Parsons considers the design of an optimal social insurance program when state verification is feasible, but imperfect. For example, the Social Security disability system rejects approximately one-half of those who claim to be totally disabled, but the disability screening mechanism is imperfect, with a classification error of perhaps 20 percent. Other things equal, the severely disabled would prefer a program that would not reject them. However, if program resources are limited and the screening technology is imperfect, even that target group might prefer an active screening policy. A positive screening policy also may be optimal if rigorous screening reduces the application rate of ineligible claimants.

The 1977 amendments to the Social Security Act created a substantial, unanticipated differential in benefits for otherwise identical individuals who were born either before or after 1917. This differential has become known as the benefit notch. Krueger and Pischke find that the downward trend in labor supply continued for the "notch babies," even though they received lower Social Security benefits than earlier cohorts did.

Altig and Davis show how gifts between parents and children and constraints on borrowing can affect the response of saving and economic welfare to funded and unfunded Social Security programs. Borrowing constraints pin down the optimal timing of altruistic transfers between generations and have profound implications for fiscal policy in economies with altruistic agents. If children make gifts to their parents, then Social Security programs have little impact on the interest rate, regardless of whether borrowing constraints bind and regardless of whether parents make gifts to their children.

# Competition in Deregulated Airlines Markets

The NBER held a conference on Competition in Deregulated Airlines Markets on May 12 in Cambridge. Research Associate Timothy F. Bresnahan, Stanford University, organized the following program:

Steven Berry, Yale University, "Estimation of a Model of Entry in the Airline Industry"

Discussant: Robert Porter, Northwestern University  
Michael Whinston, NBER and Harvard University, "Entry, Contestability, and Deregulated Airlines Markets: An Event Study Analysis"

Discussant: Ariel Pakes, NBER and Yale University  
Gloria Hurdle, Richard Johnson, Andrew Joskow, Gregory Werden, and Michael Williams, U.S. Department of Justice, "Concentration, Potential Entry, and Performance in the Airline Industry"

Discussant: Bronwyn H. Hall, NBER and University of California at Berkeley

Severin Borenstein, University of Michigan, and Nancy L. Rose, NBER and MIT, "Price Discrimination in Airline Markets"

Discussant: Mark Roberts, Pennsylvania State University

Berry considers the effect on an airline's profitability of its scale of operation in an airport. He treats the observed decisions of firms to enter airports as an indication of underlying profitability. Underlying firm profits are allowed to vary with the endogenously determined number of firms and with firm heterogeneity. Berry's results indicate that city-pair profits depend on the scale of airport operation and on the number of entering firms.

Whinston examines stock price reactions to announcements of entry into airport-pair markets by People Express airlines in 1984 and 1985. He shows that incumbents on entered routes suffer significant reductions in stock value on the announcement dates. Prices of other airline stocks do not fall on those days. This suggests that a significant degree of localization in competition prevents a general dissipation of the effects of entry. Also, there is some evidence of value losses associated with operations at the newly entered airport.

Hurdle and her coauthors study the effect of potential entry on performance in airline markets. They find that the best measure of market concentration takes into account not only the number and size distribution of incumbents, but also the number of *potential* entrants not significantly disadvantaged because of economies of scale and scope. They find that the threat of entry keeps airlines from raising their fares in contested markets.

Borenstein and Rose investigate the dispersion in prices paid by different customers of a given airline on a given route. They find an average difference in fares for two passengers on a route of more than 30 percent

of the airline's mean ticket price on the route. Moreover, the pattern of price dispersion is not explained solely by differences in the costs of serving different passengers. Dispersion is higher on more competitive routes and higher for carriers with smaller route shares. Airport dominance by a carrier tends to raise price dispersion, which may reflect the enhanced effectiveness of "frequent flyer" plans as a discriminatory device. Markets with higher flight density tend to exhibit less dispersion, as do markets dominated by tourist traffic.

Also attending the conference were: Geoffrey Carliner, NBER; Dennis W. Carlton, NBER and University of Chicago; Richard E. Caves and Pankaj Ghemawat, Harvard University; Zvi Griliches, NBER and Harvard University; Paul L. Joskow, NBER and MIT; Alfred E. Kahn, Cornell University; Melanie Mauldin, University of California at Berkeley; Thomas G. Moore, Council of Economic Advisers; John C. Panzar, Northwestern University; Peter C. Reiss, NBER and Stanford University; Richard Schmalensee, MIT; and Jack Wells, General Accounting Office.

## Conference on Political Economy

The NBER held a conference on political economy in Cambridge on May 19-20. Alberto Alesina, NBER and Harvard University, organized the following program:

Sebastian Edwards and Guido Tabellini, NBER and University of California at Los Angeles, and Alex Cukierman, Tel Aviv University, "Seigniorage and Political Instability"

Discussant: Nouriel Roubini, NBER and Yale University

John Londregan and Keith Poole, Carnegie-Mellon University, "Coups d'Etat and the Military Business Cycle"

Discussant: James Alt, Harvard University

Linda Cohen, University of California at Irvine, "Political Perceptions of Economics: The Case of Synthetic Fuel Development"

John Ferejohn and Charles R. Shipan, Stanford University, "The Threat of Legislation: Congress and Administrative Agencies"

Discussant: Paul L. Joskow, NBER and MIT

Matthew McCubbins, University of California at San Diego, "Party Governance and U.S. Budgetary Policy"

Discussant: Robert P. Inman, NBER and University of Pennsylvania

David Baron, Stanford University, "Regulatory Incentives Mechanisms, Commitment, and Political Action"

Jean Tirole, MIT, and Jean-Jacques Laffont, Harvard University, "The Politics of Government Decision-making: Regulatory Institutions" and "The Politics of Government Decisionmaking: A Theory of Regulatory Capture"

Discussant: Thomas Romer, Carnegie-Mellon University

Barry Weingast, Stanford University, "The Political Economy of Regulatory Agency Decisionmaking"

Discussant: Jeffrey Banks, University of Rochester

Seigniorage is an optimal source of governmental revenue if there is tax evasion or there are large tax collection costs. Edwards and Tabellini argue that the efficiency of the tax system also reflects deliberate political decisions, as well as its stage of development or the structure of the economy. In particular, the equilibrium efficiency of the tax system, and hence seigniorage, also depend on political stability. They find that more unstable countries rely on seigniorage much more than stable and homogeneous societies do.

The transfer of power through the use of military force is a commonplace event in world affairs. No two coups d'etat are identical, but their common denominator generally is poverty, according to Londregan and Poole. They analyze political and economic data from 121 countries for 1950-82 and find that the poorest countries are 21 times more likely than the richest to experience coups. Poverty also increases the likelihood that a government is *overthrown* by a coup. Thus even authoritarian governments have powerful incentives to promote economic growth, not out of concern for the welfare of their citizens, but because failure to deliver adequate economic performance may lead to their removal. Londregan and Poole also find that the aftereffects of a coup include a heritage of political instability and an increased likelihood of further coups.

The synthetic fuel development program was arguably the worst of the energy policies instituted by the U.S. federal government following the oil crises in the 1970s. Project choices were made in haste, using technologies that were poorly suited to the program's goals and that had little chance of technological success. The program was characterized by boom and bust cycles, and was cancelled in the early 1980s. Cohen analyzes roll call votes in Congress and relates program failures to changes in the coalition of support groups in Congress. She shows that the program was not a simple pork barrel. Support in Congress depended on a shaky coalition that formed after OPEC oil shocks in the 1970s, but evaporated once oil prices started falling in the 1980s. Cohen finds that the poor choices made in this program were the result of compromises and pressures created by different elements of the congressional coalition.

Ferejohn and Shipan examine the role of congressional committees in setting telecommunication policy. Congressional committees signal their view to regulatory agencies, and agencies are influenced by congressional preferences, whether or not legislation is

actually enacted. Ferejohn and Shipan find that the FTC did seem to be influenced by congressional actions other than the passage of legislation.

Although the United States has run budget deficits in 50 out of the last 60 years, the rate of growth and the size of the budget deficits in the 1980s are unprecedented, with the annual budget shortfall exceeding \$200 billion in 1986. According to McCubbins, annual budget deficits between World War II and 1981 were, in part, a consequence of countercyclical responses by the federal government to changes in the economy: Congress and the president spend more on domestic programs to counteract downturns in the economy. Armed conflicts also explain some budget deficits, as the government borrows to increase defense spending. The runaway deficits of the 1980s, however, are the result of conflicts between the political parties that control the different branches of government, McCubbins believes. Democratic control of the House with Republican control of the Senate led to a bilateral veto game in which the equilibrium was to increase spending on domestic and defense programs alike. Spending during Reagan's two terms in office climbed from \$600 billion to almost \$1.2 trillion. On the revenue side, Reagan used his institutional position, and the veto provided him by the Constitution, to forestall any tax increases and to protect the tax cuts won in 1981. Thus the deficits of the 1980s are the political fallout of a divided government.

Baron considers the political and economic strategies of participants in regulation and characterizes an optimal regulatory policy that anticipates both types of strategies. In his model, political action arises from the conjunction of incomplete information, which allows the firm to earn rents on its information, and the public observability of the performance of the regulated firm. In equilibrium, the regulator anticipates political action by choosing prices low enough that its commitment to its policy can be preserved. Political action by consumer interest groups make the regulated firm better off and consumers worse off.

Tirole and Laffont compare two approaches to regulating a monopoly: average cost pricing (associated with the absence of transfers) and marginal cost pricing (associated with the possibility of transfers). The regulator may identify with the industry, but a regulatory hearing offers the advocacy groups (watchdogs) an opportunity to alter the proposed rule. The advantages of the two approaches depend on the deadweight loss associated with collusion and on the effectiveness of watchdog supervision.

In their second paper, Tirole and Laffont study the potential identification of a regulatory agency with the interests of a regulated firm or with nonindustry groups. They show that: 1) the organizational response to the possibility of agency politics is to reduce the stakes that the interest groups have in regulation; 2) the threat of producer protection leads to low-powered incentive schemes for the regulated firm; 3) consumer politics may induce uniform pricing by a multiproduct firm;



and 4) the regulatory agency is not necessarily captured by the interest group with the highest willingness to pay.

Can politicians still influence bureaucrats after an agency has been created? Probably, Weingast shows, because politicians anticipate a problem and adapt to it in a variety of ways. Politicians do not depend on an agency for information, but rather rely on their constituents. In work with Matthew McCubbins and Roger Noll, Weingast shows how administrative procedures limit the ability of agencies to manipulate their sponsors. For example, the Administrative Procedures Act prevents agencies from secretly conspiring against politicians. Instead, agencies must announce well in advance what issues they will consider. Also, under the Freedom of Information Act, any agency's information must be available to politically relevant constituents.

Also attending the conference were: Robert J. Barro, Martin Feldstein, and N. Gregory Mankiw, NBER and Harvard University; Geoffrey Carliner, NBER; I. M. Destler, Institute for International Economics; Dennis Epple and Howard Rosenthal, Carnegie-Mellon University; Henry S. Farber and Nancy L. Rose, NBER and MIT; Herschel I. Grossman, NBER and Brown University; Robert P. Inman, NBER and University of Pennsylvania; Robert Powell and Kenneth A. Shepsle, Harvard University; Stephen W. Salant, University of Michigan; James Snyder, University of Chicago; and Charles Stewart, MIT.

## Miniconference on Macroeconomic History

On June 2, the NBER held a miniconference on macroeconomic history in Cambridge. NBER researchers N. Gregory Mankiw, Harvard University, and Christina D. Romer, University of California at Berkeley, organized the following program:

Peter Temin, NBER and MIT, "The Midas Touch: The Spread of the Great Depression"

Discussant: Kathryn M. Dominguez, NBER and Harvard University

Eugene White, Rutgers University, "When the Ticker Ran Late: The Stock Market Boom and Crash of 1929"

Discussant: Robert B. Barsky, NBER and University of Chicago

Bennett T. McCallum, NBER and Carnegie-Mellon University, "Could a Monetary Base Rule Have Prevented the Great Depression?"

Discussant: Frederic S. Mishkin, NBER and Columbia University

Discussion of New Historical Macroeconomic Data

Angela Redish, University of British Columbia, "The Evolution of the Gold Standard in England"

Discussant: J. Bradford DeLong, NBER and Harvard University

Michael D. Bordo, NBER and Rutgers University, and Finn Kydland, Carnegie-Mellon University, "The Gold Standard as a Rule"

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

Temin argues that the depth of the Great Depression was caused by the unyielding commitment to the gold standard by fiscal and monetary authorities in the large industrial countries. They attempted to deflate their economies to restore international equilibrium, but they succeeded only in the first of these aims. The downturn became the Great Depression as a result of the continuation of deflationary policies long after the decline was underway.

Although the stock market boom and bust are important parts of all accounts of the Great Depression, they have received very little scholarly attention. White surveys the various explanations offered for the rise and collapse of stock prices and finds that easy credit played no role in the stock market boom. Instead, the market drew its strength from the long economic expansion of the 1920s, which produced higher earnings and dividends. However, the rise in stock prices outstripped these fundamentals and was the product of structural changes in the economy, accompanied by a shift in corporate finance. A number of explanations have been offered for the crash, but it was the combined effects of a recession and very tight credit that brought it to an end.

McCallum investigates a monetary rule under which the monetary base is set to keep nominal GNP growing smoothly at a noninflationary rate. He uses quarterly U.S. data for 1922-41 to conduct counterfactual historical simulations with the rule and to estimate a small model of nominal GNP determination. McCallum's results indicate that nominal GNP would have been kept reasonably close to a steady 3 percent growth path from 1923-41 if the rule had been in effect. In that case, it is highly unlikely that real output and employment could have collapsed as they did during the 1930s.

In the discussion of new data, David Weir, Yale University, presented his series of government bond yields in France from 1752-93. Susan B. Carter, Smith College, and Richard Sutch, NBER and University of California at Berkeley, talked about micro level data they have derived from reports of state bureaus of labor statistics. Jeffrey A. Miron, NBER and University of Michigan, and Christina D. Romer described a new index of industrial production from 1884-1940 that they have developed.

Redish argues that the introduction of steam engines and the assistance of the Bank of England allowed England in the nineteenth century to establish a stable token coinage, which was a prerequisite for the success of the gold standard. In 1816, England official-

ly abandoned bimetallism and made silver coins into tokens that were only limited legal tender. Redish believes that earlier monetary authorities lacked the ability to introduce a token coinage that was a necessary complement to the monometallic gold standard. A successful token coinage must be costly to counterfeit and must be credibly backed to ensure that the tokens do not depreciate to their intrinsic value.

Bordo and Kydland show that the monetary rule followed before 1914 by a number of key countries, especially England and to a lesser extent the United States, was consistent with commitment to a long-run policy. Moreover, the experience of those major countries suggests that the gold standard was intended as a contingent rule. However, the experiences of other countries suggests that the gold standard was often viewed more as a desirable goal than an operational constraint.

Other participants at the miniconference were: Ben S. Bernanke, NBER and Princeton University; Michael Bernstein, University of California at San Diego; Oliver J. Blanchard, NBER and MIT; Charles W. Calomiris, Northwestern University; Geoffrey Carliner, NBER; Steven G. Cecchetti, NBER and Ohio State University; Todd Clark, University of Michigan; Alexander Field, Santa Clara University; Marvin Goodfriend, Federal Reserve Bank of Richmond; James Hamilton, University of Virginia; Carol Heim, University of Massachusetts at Amherst; Levis A. Kochin, University of Washington; Gail Makinen, Congressional Research Service; Daniel Raff, NBER and Harvard University; and Anna J. Schwartz, NBER.

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 Fall 1989 issue of the *Reporter* is September 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

**July 30–August 2, 1989**

Annual Meeting, American Agricultural Economics Association\*

**August 1, 1989**

Latin American Meeting, Econometric Society

**August 14–17, 1989**

Joint Statistical Meetings, American Statistical Association\*

**August 27–31, 1989**

Public Finance and Steady Economic Growth: 45th Conference of International Institute of Public Finance\*

**September 4–8, 1989**

European Meeting, Econometric Society

**September 13–15, 1989**

Conference on Mismatch and Labor Mobility, Center for Economic Policy Research

**September 14–15, 1989**

Panel Meeting on Economic Activity, Brookings Institution

**September 22–23, 1989**

Conference on Economics of Defense Procurement, NBER

**September 24–27, 1989**

31st Annual Meeting, National Association of Business Economists\*

**September 27–28, 1989**

4th Annual Conference on Business Forecasting, International Association of Business Forecasting\*

**October 4–7, 1989**

19th (Biannual) Conference, Center for International Research on Economic Tendency Surveys

**October 5–8, 1989**

International Atlantic Economic Conference, Atlantic Economic Society\*

**October 6–7, 1989**

Conference on Economic Growth, NBER

**October 8–11, 1989**

82nd Annual Conference, National Tax Association–Tax Institute of America\*

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

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## Conference Calendar

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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.**

**October 11, 1989**

Public Policy Options to Increase U.S. National Saving, American Council for Capital Formation\*

**October 13-14, 1989**

Conference on Strategic Trade, NBER

**October 17, 1989**

Round Table: Reducing the Risk of Economic Crisis, NBER

**October 19-20, 1989**

Conference on the United States and Japan in the 1990s, NBER

**October 26-27, 1989**

Program Meeting: Financial Markets and Monetary Economics, NBER

**November 3-4, 1989**

Conference on Research in Income and Wealth: International Economic Transactions, NBER

**November 14, 1989**

Conference on Tax Policy and the Economy, NBER

**November 16-17, 1989**

Program Meeting: Taxation, NBER

**November 17-18, 1989**

Carnegie-Rochester Public Policy Conference, Carnegie-Mellon University—University of Rochester

**November 19-21, 1989**

Annual Meeting, Southern Economic Association\*

**December 8-9, 1989**

Universities Research Conference: Labor Markets in the 1990s, NBER

**December 14-15, 1989**

Panel on Economic Activity: Microeconomics, Brookings Institution

**December 15-16, 1989**

Program Meeting: International Studies: "International Competitiveness," NBER

**December 28-30, 1989**

Annual Meeting, American Economic Association\*

**December 28-30, 1989**

North American Winter Meeting, Econometric Society\*

**January 4-6, 1990**

Mismatch and Labor Mobility, Center for Economic Policy Research

**January 7-8, 1990**

Conference on Corporate Finance, NBER, Tokyo Center for Economic Research, and Center for Economic Policy Research

**March 9-10, 1990**

5th Annual Macroeconomics Conference, NBER

**March 17-23, 1990**

International Atlantic Economic Conference, Atlantic Economic Association\*

**March 22-24, 1990**

Conference on Financial Crisis, NBER

**March 29-31, 1990**

3rd Annual InterAmerican Seminar on Economics, NBER

**March 29-31, 1990**

Annual Meeting, Midwest Economics Association\*

**April 5-6, 1990**

Panel on Economic Activity, Brookings Institution

**April 5-7, 1990**

Conference on Aging, NBER

**April 5-7, 1990**

1990 Annual Meeting, Eastern Finance Association\*

**April 12-14, 1990**

Conference on Economic Growth, NBER

**April 19-20, 1990**

Program Meeting: Taxation, NBER

**April 20-21, 1990**

Carnegie-Rochester Public Policy Conference, Carnegie-Mellon University—University of Rochester

**May 4-5, 1990**

Conference on Research in Income and Wealth: Measurement Issues in the Service Sector, NBER

**May 11-12, 1990**

Universities Research Conference, Financial Markets and Monetary Economics, NBER

**May 18-19, 1990**

Conference on Populist Economics in Latin America, NBER

**August 26-30, 1990**

46th Conference: Public Finance with Several Levels of Government, International Institute of Public Finance\*

**September 13-14, 1990**

Panel on Economic Activity, Brookings Institution

**September 23-26, 1990**

Annual Meeting, National Association of Business Economists\*

**October 18-20, 1990**

Annual Research Conference, Association for Public Policy Analysis and Management\*

**October 18-21, 1990**

Conference on American Economic Policy, NBER

**November 18-20, 1990**

Annual Meeting, Southern Economic Association\*

**December 28-30, 1990**

Annual Meeting, American Economic Association\*

**March 21-24, 1991**

Conference on Economic Crisis, NBER

**April 4-6, 1991**

Annual Meeting, Midwest Economic Association\*

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

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

## Labor Markets in the 1990s: A Call for Papers

On December 8 and 9, 1989, the National Bureau of Economic Research will hold a conference in Cambridge on Labor Markets in the 1990s. The program, being organized by Professor Robert H. Topel of the NBER and the University of Chicago, will consist of seven papers with two formal discussants for each paper. There will be no published proceedings, but the conference will be summarized in the *NBER Reporter*.

The conference will include a wide range of research on the evolution of modern labor markets. Appropriate topics include, but are not limited to: declining membership in unions and the future of collective bargaining; the impact of international trade on the labor market; the role of labor markets in economic development; labor market adjustments to immigration; income and wage inequality; black-white wage differentials; patterns of regional adjustment in wages and employment and their causes; the aging of the baby-boom generation; and the impact of declining birth cohort sizes on wages and employment.

In keeping with Bureau tradition, priority will be given to empirically oriented research. Theoretical research on substantive topics related to the conference theme is also welcome.

Papers will be selected on the basis of abstracts of about 500 words or, when possible, completed papers, with preference be given to papers by younger members of the profession. Any research not published at the time of the conference may be submitted. The deadline for submission of abstracts and papers is September 8, 1989. Authors chosen to present papers will be notified by October 2, 1989. Final drafts of papers must be received by the NBER on or before November 6, 1989. The NBER will pay expenses of those chosen to give papers at the conference.

Abstracts should be sent to Professor Robert H. Topel, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

## Labor Economists Meet

About 40 members and guests of the NBER's Program in Labor Studies met in Cambridge on April 14. Program Director Richard B. Freeman, of Harvard University, organized the following agenda:

George E. Johnson and John Bound, NBER and University of Michigan, "Changes in the Structure of Wages during the 1980s: An Evaluation of Alternative Explanations"

Lawrence F. Katz, NBER and Harvard University, and Ana L. Revenga, Harvard University, "The Changing Value of Higher Education: United States versus Japan"

Robert E. Lipsey, NBER and City University of New York (joint work with Irving B. Kravis, NBER and University of Pennsylvania), "The Effect of Multinational Firms' Foreign Operations on Their Domestic Employment" (NBER Working Paper No. 2760)

David Blanchflower, University of Surrey, and Andrew Oswald, London School of Economics, "The Wage Curve"

Between 1979 and 1987, there were three significant changes in the wage structure in the United States: the returns to schooling increased by about one-third; the wages of older relative to younger workers with relatively little education increased somewhat; and the wages of women relative to men rose by over 10 percent. Johnson and Bound investigate six possible explanations of these changes. They doubt that the principal cause of change was a shift in the structure of product demand brought about by foreign trade and other developments. They suggest that the dramatic movements in the wage structure over this period may have been caused by some combination of changes in production technology and changes in the quality of different labor groups.

Katz and Revenga examine movements in the structure of wages in the United States and Japan in the 1980s. They find that the earnings of college graduates have increased dramatically relative to those of less-educated workers in the United States since the late 1970s. Educational wage differentials for most demographic groups have increased slightly in Japan over the same period. Katz and Revenga find that larger shifts in product demand away from industries that have traditionally employed less-educated workers (particularly durable goods manufacturing) and a smaller increase in the relative supply of college graduates in the United States than in Japan both help to explain the much sharper increase in educational wage differentials in the United States.

Lipsey and Kravis find that the more a U.S. multinational firm produces abroad, the higher is the average skill level of its U.S. employees and the lower is its U.S. employment per dollar of output. They suggest that multinationals with more foreign operations have a greater opportunity to reallocate labor-intensive operations abroad, reducing demand for unskilled American workers. Firms tend to keep their skill-intensive operations at home, thus raising their average compensation levels. Even where no actual shift takes place, the growth of activity increases the demand for highly paid home office supervisors.

Blanchflower and Oswald examine the relationship between area and industry unemployment and real wage rates. Using several datasets on individuals and workplaces, they find that the level of real wages declines at first as unemployment rises, with some indication of a rise in wages at very high levels of unemployment. Their evidence contradicts interpretations of area unemployment based on compensating differentials.

## Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-1154 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. Please do not send cash. Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

1155. "The Information in the Term Structure: Some Further Results," by Frederic S. Mishkin, 1988 (NBER Working Paper No. 2575)
1156. "The Budget Deficit and the Dollar," by Martin Feldstein, 1986 (NBER Working Paper No. 1898)
1157. "Some Recent Developments in Labor Economics and Their Implications for Macroeconomics," by Lawrence F. Katz, 1988
1158. "Trade in Risky Assets," by Lars E. O. Svensson, 1988 (NBER Working Paper No. 2403)
1159. "Seasonality, Cost Shocks, and the Production-Smoothing Model of Inventories," by Jeffrey A. Miron and Stephen P. Zeldes, 1988 (NBER Working Paper No. 2360)
1160. "Returns to Seniority in Union and Nonunion Jobs: A New Look at the Evidence," by Katharine G. Abraham and Henry S. Farber, 1988 (NBER Working Paper No. 2368)
1161. "Pareto Inefficiency of Market Economies: Search and Efficiency Wage Models" by Bruce C. Greenwald and Joseph E. Stiglitz, 1988 (NBER Working Paper No. 2651)
1162. "The Mundell-Fleming Model a Quarter Century Later: A Unified Exposition," by Jacob A. Frenkel and Assaf Razin, 1987 (NBER Working Paper No. 2321)
1163. "Forward Discount Bias: Is It an Exchange Risk Premium?" by Kenneth A. Froot and Jeffrey A. Frankel, 1989 (NBER Working Paper No. 1963)
1164. "Foreign Trade Shocks and the Dynamics of High Inflation: Israel, 1978-85," by Leonardo Leiderman and Assaf Razin, 1988 (NBER Working Paper No. 2003)
1165. "Errors of Measurement in Output Deflators," by Frank R. Lichtenberg and Zvi Griliches, 1989 (NBER Working Paper No. 2000)
1166. "Buybacks, Exit Bonds, and the Optimality of Debt and Liquidity Relief," by Kenneth A. Froot, 1989 (NBER Working Paper No. 2675)
1167. "Development of the ECU Markets: Perspectives on Financial Innovation," by Richard M. Levich, 1987 (NBER Working Paper No. 2276)
1168. "Assessing Dynamic Efficiency: Theory and Evidence," by Andrew B. Abel, N. Gregory Mankiw, Lawrence H. Summers, and Richard J. Zeckhauser, 1989 (NBER Working Paper No. 2097)
1169. "A Viable Gold Standard Requires Flexible Monetary and Fiscal Policy," by Willem H. Buiter, 1989 (NBER Working Paper No. 1903)
1170. "Stock Prices, Earnings, and Expected Dividends," by John Y. Campbell and Robert J. Shiller, 1988 (NBER Working Paper No. 2511)
1171. "Tax Neutrality and Intangible Capital," by Don Fullerton and Andrew B. Lyon, 1988 (NBER Working Paper No. 2430)
1172. "Monetary Dynamics with Proportional Transaction Costs and Fixed Payment Periods," by Sanford J. Grossman, 1987 (NBER Working Paper No. 1663)
1173. "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors," by John Y. Campbell and Robert J. Shiller, 1989 (NBER Working Paper No. 2100)
1174. "Sectorial Wages and the Real Exchange Rate," by Joshua Aizenman and Jacob A. Frenkel, 1988 (NBER Working Paper No. 1801)
1175. "Interpreting Cointegrated Models," by John Y. Campbell and Robert J. Shiller, 1988 (NBER Working Paper No. 2568)
1176. "On the Mechanics of Economic Development," by Robert E. Lucas, Jr., 1988
1177. "The Contribution of A Monetary History of the United States, 1867-1960 to Monetary History," by Michael D. Bordo, 1989 (NBER Working Paper No. 2549)
1178. "Breach of Trust in Hostile Takeovers," by Andrei

Shleifer and Lawrence H. Summers, 1988 (NBER Working Paper No. 2342)

1179. "Are Cyclical Fluctuations in Productivity Due More to Supply Shocks or Demand Shocks?" by Matthew D. Shapiro, 1987 (NBER Working Paper No. 2147)
1180. "Stock Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test," by Andrew W. Lo and A. Craig MacKinlay, 1988 (NBER Working Paper No. 2168)
1181. "The Effect of Economic Events on Votes for President: 1984 Update," by Ray C. Fair, 1988 (NBER Working Paper No. 2222)
1182. "Monetary Policy without Quantity Variables," by Benjamin M. Friedman, 1988 (NBER Working Paper No. 2552)
1183. "Efficiency Wages and the Interindustry Wage Structure," by Alan B. Krueger and Lawrence H. Summers, 1988 (NBER Working Paper No. 1952)
1184. "Fiscal Policies and International Financial Markets," by Alan C. Stockman, 1988 (NBER Working Paper No. 1961)
1185. "Flexible Functional Forms and Global Curvature Conditions," by W. Erwin Diewert and Terence J. Wales, 1987 (NBER Technical Working Paper No. 40)
1186. "Monopoly Wealth and International Debt," by Jonathan Eaton, 1989 (NBER Working Paper No. 2485)
1187. "Earnings and Income Inequality in the United States," by McKinley L. Blackburn and David E. Bloom, 1987 (NBER Working Paper No. 2337)
1188. "Effect of Taxation with International Capital Mobility," by Joel B. Slemrod, 1988
1189. "Infant-Industry Protection Reconsidered: The Case of Informational Barriers to Entry," by Gene M. Grossman and Henrik Horn, 1988 (NBER Working Paper No. 2159)
1190. "Collective Bargaining Laws, Threat Effects, and the Determination of Police Compensation," by Casey Ichniowski, Richard B. Freeman, and Harrison Lauer, 1989 (NBER Working Paper No. 1578)
1191. "Macroeconomic Effects of Price Controls: The Role of Market Structure," by Elhanan Helpman, 1988 (NBER Working Paper No. 2434)
1192. "Lessons on Monetary Policy from the 1980s," by Benjamin M. Friedman, 1988 (NBER Working Paper No. 2551)

## Historical Factors and Long-Run Growth

The NBER has initiated a new Working Paper series in "Historical Factors and Long-Run Growth." These papers are a product of the NBER's Program in Development of the American Economy, directed by Robert W. Fogel of the University of Chicago. The research in this program typically looks backward, often using newly available primary sources of data in an attempt to explain economic growth and change. This new Working Paper series should be of interest to historians as well as to economists.

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## Bureau Books

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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.

## Trade Policies for International Competitiveness

*Trade Policies for International Competitiveness*, edited by Robert C. Feenstra, will be available from the University of Chicago Press this summer for \$35.

This NBER Conference Report includes seven papers that look at various ways that a country's policies can help its export or import-competing industries to maintain their market share. Tax policies that affect saving and investment, strategic policies targeted at specific industries, and the more conventional tariffs and non-tariff barriers are all discussed and evaluated. One chapter focuses on foreign direct investment, and another considers monopolistic pricing in international markets. The evidence presented is for the United States, Canada, and Japan, but applies to other industrial countries as well.

This volume will be a useful reference for policymakers, academics, and graduate students. Its editor, Feenstra, is a research associate in the NBER's Program in International Studies and an associate professor of economics at the University of California at Davis.

## CRIW Study of Saving and Investment

*The Measurement of Saving, Investment, and Wealth*, edited by Robert E. Lipsey and Helen Stone Tice, will be available from the University of Chicago Press this summer for \$85.

This volume is No. 52 in the NBER's Studies in Income and Wealth, the first of which was published in 1937. In the introduction, Lipsey and Tice describe the intellectual history of the series, and how the papers that follow fit the tradition. The major objectives of this book are to discuss ways to improve estimates of aggregate and sectorial saving and investment and to evaluate some of the new microdata on household wealth.

This volume is technical and designed especially for academic and government economists.

Lipsey is an NBER research associate, director of the Bureau's New York office, and a professor of economics at Queens College and the Graduate School and University Center, CUNY. Tice is assistant to the director of the Bureau of Economic Analysis, U.S. Department of Commerce.

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## Current Working Papers

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

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

## Historical Factors and Long-Run Growth

### Second Thoughts on the European Escape from Hunger: Famines, Price Elasticities, Entitlements, Chronic Malnutrition, and Mortality Rates

**Robert W. Fogel**

Historical Working Paper No. 1

May 1989

JEL Nos. 040, 110

This paper has six principal findings: 1) Crisis mortality accounted for less than 5 percent of total mortality in England prior to 1800; the elimination of crisis mortality accounted for just 15 percent of the decline in total mortality between the eighteenth and nineteenth centuries. 2) Using variations in wheat prices to measure variations in the food supply has led to gross overestimates of the variability of the food supply. 3) The famines that plagued England between 1500 and 1800 were man-made, the consequence of failures in the system of food distribution related to an extremely inelastic demand for food inventories, rather than to natural calamities or inadequate technology. 4) Not only did the government have the power to eliminate famines but, in fact, the food distribution policies of James I and Charles I succeeded in reducing the variability of annual wheat prices by over 70 percent. 5) A change in government policy could not have eliminated chronic malnutrition. Elimination of chronic malnutrition required technological changes that permitted the per capita consumption of food to increase by about 50 percent. 6) Improvements in average nutritional status appear to explain nearly all of the decline in mortality rates in England, France, and Sweden between 1775-1875 but only about half of the mortality decline since 1875.

### A State and Local Consumer Price Index for the United States in 1890

**Michael R. Haines**

Historical Working Paper No. 2

May 1989

JEL No. 042

This paper estimates a cost-of-living index for 39 states and the District of Columbia, as well as for 70 individual cities and towns, for 1890. It gives an overall index in addition to seven commodity subindexes (food, clothing, housing, fuel and lighting, furniture, liquor and tobacco, and other commodities). The cost of housing is provided for only 21 of the states and five of the



cities, however. Separate overall indexes are calculated with and without housing costs. For all of the prices except housing, the source is the Aldrich Report. Housing costs were derived from the 1889-90 U.S. Commissioner of Labor Survey and from the 1961 NBER work of Albert Rees on real wages in American manufacturing. These price indexes constitute simple fixed-weight Lespeyres indexes and are not "true" constant utility cost-of-living indexes.

### **The Trend in the Rate of Labor Force Participation of Older Men, 1870-1930: A Review of the Evidence**

**Roger L. Ransom and Richard Sutch**

Historical Working Paper No. 3

May 1989

JEL Nos. 042, 110

We present new evidence to support our earlier finding that there was no appreciable trend in the rate of retirement for American men between 1870 and 1930. The data suggest that Jon Moen's claim that retirement increased appreciably during this period is mistaken. We also examine point by point Moen's critique of our earlier paper and demonstrate that his doubts about our procedures are unfounded.

### **Economic and Geographic Mobility on the Farming Frontier: Evidence from Appanoose County, Iowa, 1850-70**

**David W. Galenson and Clayne L. Pope**

Historical Working Paper No. 4

May 1989

JEL Nos. 042, 110

This paper investigates the characteristics of the early settlers on the midwestern farming frontier, the correlates of their geographic mobility, and the determinants of their wealth. Using evidence drawn from the manuscripts of the federal censuses of 1850-70, we find that: average rates of growth of wealth over time were considerably above the national average; there is a steeper cross-sectional relationship between wealth and age than was found for populations drawn more broadly from throughout the United States at the same time; there is a substantial positive effect on wealth levels of early arrival on the frontier. These results suggest that very high levels of economic opportunity may have been a characteristic of the nineteenth-century farming.

## **NBER Working Papers**

### **Bounds on the Variances of Specification Errors in Models with Expectations**

**Steven N. Durlauf and Robert E. Hall**

Working Paper No. 2936

April 1989

JEL Nos. 212, 313, 131

Under rather general conditions, observed covariances place a useful lower bound on the variance of the misspecification or noise in models based on expectations. Such models are widely used for securities prices, exchange rates, consumption, and output. For a correctly specified model, the lower bound will be zero. We construct an optimal bound on model noise that captures the complete set of testable restrictions on an expectations-based model. Many specification tests for asset prices are easily interpreted as estimates of this lower bound. As a result, the power of different tests may be ranked according to the information restrictions employed in constructing noise estimates. Our results show that specification tests that use the history of lagged dependent variables usually are better able to uncover model noise than when based on information sets that exclude those variables.

### **Competitive Externalities and the Optimal Seigniorage**

**Joshua Aizenman**

Working Paper No. 2937

April 1989

JEL No. 400

This study analyzes the behavior of the inflation tax in an economy where, because of coordination failure, the inflation rate is not determined by a unique policymaker but rather by several competing decisionmakers. Each decisionmaker effectively can print more paper money via the central bank, which operates only as the printing agency of nominal balances. This market structure generates a competitive externality. A key result is that the "optimal" inflation rate depends positively on the competitive externality. I provide two examples of scenarios in which these externalities are relevant: first, the case in which the central bank is a powerless agent whose only responsibility is to print money upon demand by the ministers; second, a common currency area, where several countries operate in a monetary union. Alternatively, this may be the case of a country composed of several states or provinces, where the centralized government system is weak and local governments can use seigniorage to their advantage. The effect of competitive externalities is to increase the inflation rate to an extent that puts the economy on the wrong side of the inflation tax Laffer curve.

## **Toward a Theory of Rigidities**

**Bruce C. Greenwald and Joseph E. Stiglitz**

Working Paper No. 2938

April 1989

JEL No. 023

This paper presents a theory of rigidity or, more properly, inertia, in the responses of economic variables to changing environments. The theory rests on three fundamental assumptions: 1) that firms are risk averse; 2) that firms are uncertain of the impacts of changing decision variables; and 3) that this uncertainty increases with the size of deviations in decision variables from past level that is defined appropriately. Under these circumstances, an optimal portfolio of incremental adjustments in decision variables exists that: takes variance-minimizing adoptions to environmental change as a point of departure and then is weighted in favor of changes in variables whose effects are less uncertain. This implies that price and wage adjustments largely should incorporate expected inflation and, from that point, should be small relative to quantity adjustments; in most situations, the uncertainties associated with the consequences of quantity adjustment should be smaller than those associated with price adjustments.

## **Signaling, Wage Controls, and Monetary Disinflation Policy**

**Torsten Persson and Sweder J. G. van Wijnbergen**

Working Paper No. 2939

April 1989

Wage and price controls have a long and somewhat disreputable history, presumably because they are frequently used in many countries as short-run substitutes for measures with more lasting effects on the inflation rate. In 1985 and 1986, Argentina, Brazil, and Israel each used extensive wage-price controls as part of more comprehensive disinflation programs, often labeled "heretodox" stabilization programs. To date, the Israeli stabilization seems to have succeeded, while the Argentinean and Brazilian stabilizations clearly have ended in failure. This experience raises many questions. One view is that controlling one nominal variable, namely the money supply, is enough to bring down inflation if sound fiscal policies also are adopted. Therefore, wage and price controls should be avoided, because of their microeconomic costs. Controls clearly have microeconomic costs, but can they also have macroeconomic benefits? Under which circumstances do controls help in bringing down inflation, and when do they just suppress it temporarily? What is the required supporting role of fiscal and monetary policies while they are in place?

## **Capital Controls and the Real Exchange Rate**

**Sweder J. G. van Wijnbergen**

Working Paper No. 2940

April 1989

JEL No. 431

Using an intertemporal, two-country general equilibrium model, I demonstrate that international asymmetries in expenditure patterns determine the effects of capital controls on the real exchange rate. Taxes on capital imports lower world interest rates but raise home interest rates. These changes in interest rates bring about a change in the composition of world expenditure, with a shift of home expenditure from the present ("today") to the future ("tomorrow"), and a shift of foreign aggregate expenditure from tomorrow to today.

If the pattern of expenditure across commodities is the same at home and abroad, then the change in the composition of world expenditure has no effect on the (excess) demand for any particular commodity. Therefore, with identical expenditure patterns at home and abroad, the imposition of capital controls has no effect on the real exchange rate. However, when consumers have a preference for domestically produced goods, the shift in composition of world expenditure caused by interest rate changes implies a decline today in demand for home goods. In that case, capital controls lower the real exchange rate. Of course, in the second period the reverse happens. This result is mitigated when the country imposing capital controls is a large debtor.

## **Markup Behavior in Durable and Nondurable Manufacturing: A Production Theory Approach**

**Catherine G. Morrison**

Working Paper No. 2941

April 1989

JEL Nos. 600, 631, 640

This paper provides a framework based on production theory for measuring markups of price over marginal cost, and the effects on these markups of cost and demand characteristics. I measure price-to-marginal-cost ratios for various Canadian manufacturing industries and evaluate the impacts of capacity utilization, scale economies, changing prices of variable inputs, import competition, unemployment, and other cost and demand determinants using adjusted markup indexes and elasticities of the markup ratios. The measured price margins are within a reasonable range and tend to be countercyclical. Moreover, these measures suggest that profitability stemming from the potential to increase price over marginal cost primarily appears to arise from cost characteristics that determine scale economies.

## **How Strong Are Bequest Motives? Evidence Based on Estimates of the Demand for Life Insurance and Annuities**

**B. Douglas Bernheim**

Working Paper No. 2942

April 1989

JEL Nos. 320, 918

This paper presents new empirical evidence in support of the view that a significant fraction of total saving is motivated solely by the desire to leave bequests. Specifically, I find that Social Security annuity benefits significantly raise life insurance holdings and depress private annuity holdings among elderly individuals. These patterns indicate that the typical household would choose to maintain a positive fraction of its resources in bequeathable forms, even if insurance markets were perfect. Evidence on the relationship between insurance purchases and total resources reinforces this conclusion.

## **Adjustment and Income Distribution: A Counterfactual Analysis**

**François Bourguignon, William H. Branson,  
and Jaime de Melo**

Working Paper No. 2943

April 1989

JEL Nos. 112, 431

This paper presents a structural macrosimulation model to quantify the effects of alternative stabilization packages on the distribution of income and wealth. The model combines the explicit microeconomic optimizing behavior that is characteristic of computable general equilibrium models with the asset portfolio behavior of macroeconomic models in Tobin's tradition. This model has four main mechanisms by which policy changes affect the distribution of income and wealth. First, changes in factor rewards directly affect household income distribution. Second, changes in respective cost-of-living indexes affect household real incomes. Third, changes in real returns on financial assets affect household real incomes, since household incomes include income from financial holdings. Fourth, capital gains and losses affect household wealth distribution.

We carry out simulations with the model for a representative economy subject to the interest rate and terms-of-trade shocks of the early 1980s. The simulations suggest that a sharp contractionary package has a large adverse impact on the distribution of income. The resulting distributional shifts are likely to endanger the sustainability of the package, even though the distribution of income becomes more nearly equal when normal policies are resumed. By contrast, the targeted

programs of expenditure cuts advocated by the critics of contractionary packages result in a much less unequal distribution of income during the adjustment package, even though the distributional improvements of the targeted package are mostly reversed in the post-adjustment period. The simulations support the view that stabilization packages that do not have specific components targeted toward the poor will have a noticeable adverse effect on the distribution of income, which is likely to result in some form of permanent damage for those below the poverty line.

## **Relative Performance Evaluation for Chief Executive Officers**

**Robert S. Gibbons and Kevin J. Murphy**

Working Paper No. 2944

April 1989

Measured individual performance often depends on random factors that also affect the performances of other workers in the same firm, industry, or market. In these cases, relative performance evaluation (RPE) can provide incentives while partially insulating workers from the common uncertainty. Basing pay on relative performance, however, generates incentives to sabotage the measured performance of coworkers, to collude with coworkers and shirk, and to apply for jobs with inept coworkers. RPE contracts also are less desirable when the output of coworkers is expensive to measure or in the presence of production externalities, as in the case of team production.

This paper reviews the benefits and costs of RPE and tests for the presence of RPE in one occupation in which the benefits plausibly exceed the costs: chief executive officers (CEOs). In contrast to previous research, our empirical evidence strongly supports the RPE hypothesis: CEO pay revisions and retention probabilities are positively and significantly related to firm performance but are negatively and significantly related to industry and market performance, *ceteris paribus*. Our results also suggest that CEO performance is more likely to be evaluated relative to aggregate market movements than to industry movements.

## **Financial Market Imperfections and Productivity Growth**

**Bruce C. Greenwald and Joseph E. Stiglitz**

Working Paper No. 2945

April 1989

JEL No. 023

This paper examines the impact of imperfections in the financial market on long-term productivity growth.

It focuses on failures in markets for the sale of equity securities and hence on the failure of markets that help firms diversify the risks of real investment. The paper examines separately situations in which productivity growth is driven by learning-by-doing and where it results from the cumulative impact of explicit investments in technology by firms. In general, a multiplicity of steady-state growth paths exists with different growth rates along each path. The particular path followed by any single economy (and hence the growth rate of that economy) will depend significantly on policy interventions that mitigate effects of financial markets.

## **Mean Reversion and Consumption Smoothing**

**Fischer Black**

Working Paper No. 2946  
April 1989

A simple conventional model with additive separable utility and constant elasticity can explain mean reversion and consumption smoothing. The model uses the price of risk and wealth as state variables but has only one stochastic variable. The price of risk rises temporarily as wealth falls. I also distinguish between risk aversion and the consumption elasticity of marginal utility. I can use the model to match estimates of the average values of consumption volatility, wealth volatility, mean reversion, the growth rate of consumption, the real interest rate, and the market risk premium.

## **Equilibrium Exchange Rate Hedging**

**Fischer Black**

Working Paper No. 2947  
April 1989

In a one-period model in which each investor consumes a single good, and in which borrowing and lending are private and real, there is a universal constant that tells how much each investor hedges his foreign investments. The constant depends only on average risk tolerance across investors. The same constant applies to every real foreign investment held by every investor. Foreign investors are those with different consumption goods, not necessarily those who live in different countries. In equilibrium, the price of the world market portfolio will adjust so that the constant will be related to an average of world market risk premiums, an average of world market volatilities, and an average of exchange rate volatilities, where we take the averages

over all investors. The constant will not be related to exchange rate means or covariances. In the limiting case when exchange risk approaches zero, the constant will be equal to one minus the ratio of the variance of the world market return to its mean. Jensen's inequality, or "Siegel's paradox," makes investors want significant amounts of exchange rate risk in their portfolios. It also makes investors prefer a world with more exchange rate risk to a similar world with less exchange rate risk.

## **Wage Indexation and Time-Consistent Monetary Policy**

**Laurence Ball and Stephen G. Cecchetti**

Working Paper No. 2948  
April 1989  
JEL Nos. 023, 134, 311

This paper investigates the effects of wage indexation on the time-consistent level of inflation. Departing from previous work on time-consistent policy, we study a structural model of the economy. Indexation reduces the cost of inflation, which is inflationary, and steepens the Phillips curve, which is anti-inflationary. In most cases, the net effect is to raise inflation but also to raise welfare: the loss from higher inflation is outweighed by the gain from greater protection against inflation.

## **Long-Run Income and Interest Elasticities of Money Demand in the United States**

**Dennis Hoffman and Robert H. Rasche**

Working Paper No. 2949  
April 1989  
JEL No. 311

This study investigates the stability of long-run log-linear demand functions for narrowly defined monetary aggregates (M1, monetary base) in the United States during the post-World War II period. We cannot reject the hypotheses that the individual time series that appear in such equations (real M1, real monetary base, real personal income, and short-term and long-term nominal income rates) all have unit roots. The primary conclusion of this study is that with proper attention to the time-series properties of the available data, there is strong evidence in support of a stable equilibrium demand function for real balances in the post-World War II U.S. economy. We cannot reject the hypothesis of a unitary equilibrium real income elasticity (a velocity function). Further, the estimates of equilibrium interest elasticities are approximately  $-0.5$  to  $-0.6$  for real M1 and  $-0.4$  to  $-0.5$  for real monetary base.

The estimated interest elasticities are significantly different statistically depending on whether long-term or short-term interest rates are used, but the observed differences in these estimates are not of economic significance.

## **Real Exchange Rates in the Developing Countries: Concepts and Measurement**

**Sebastian Edwards**

Working Paper No. 2950  
April 1989

This paper deals with three important issues related to real exchange rates (RERs). First, it discusses the analytical concept of the RER, particularly emphasizing an operational definition for the equilibrium RER. Of course, once this concept is defined, we can begin to discuss what we mean by RER misalignment, or deviations of the actual RER from its equilibrium value.

Second, this paper deals with problems associated with measuring RERs. I analyze several proposals and discuss the more serious problems encountered when attempting to compute RERs in the developing countries.

Third, I analyze the actual behavior of RERs in a number of developing countries. Here I emphasize issues related to the behavior of alternative indexes and to the statistical properties of RERs. Additionally, I study the real consequences of increased RER volatility.

## **The Sources and Nature of Long-Term Memory in the Business Cycle**

**Joseph G. Haubrich and Andrew W. Lo**

Working Paper No. 2951  
April 1989  
JEL No. 131

This paper examines the stochastic properties of aggregate macroeconomic time series from the standpoint of fractionally integrated models and focuses on the persistence of economic shocks. We develop a simple macroeconomic model that exhibits long-term dependence, a consequence of aggregation in the presence of real business cycles. We derive the relationship between properties of fractionally integrated macroeconomic time series and those of microeconomic data and discuss how fiscal policy may alter their stochastic behavior. To implement these results empirically, we employ a test for fractionally integrated time series based on the Hurst-Mandelbrot rescaled range. This test is robust to short-term dependence and is applied

to quarterly and annual real GNP to determine the sources and nature of long-term dependence in the business cycle.

## **Experimental Assessment of the Effect of Vocational Training on Youthful Property Offenders**

**Joanna R. Baker, Pamela K. Lattimore,  
and Ann D. Witte**

Working Paper No. 2952  
May 1989  
JEL Nos. 822, 916

In this paper we report results that suggest that carefully integrated and implemented vocational training and reentry programs for youthful property offenders can reduce the rate at which such individuals are arrested after release. This result is important since most evaluations of programs for such offenders show no significant effects. The question has been, "Why have programs rarely been known to have significant effects on the behavior of offenders?" Our results suggest that the major reasons may be that programs evaluated to date have been weak and implementation poor. Even with substantial backing from correctional management, only 16 percent of the experimental group participated in all aspects of the Vocational Delivery System (VDS). Members of the experimental group were most likely to participate in early aspects of the VDS (for example, a three-week evaluation of vocational interests and aptitudes) than in later elements (for example, work with the Employment Security Commission to find a job). Even with relatively weak implementation, the experimental group subjects were significantly less likely to be arrested than control group subjects.

## **Birth, Death, and Taxes**

**Andrew B. Abel**

Working Paper No. 2953  
May 1989  
JEL No. 321

This paper analyzes the effects of lump-sum tax policy in an overlapping-generations model in which consumers have uncertain longevity. It extends previous analyses by considering the case in which private insurance arrangements are actuarially unfair. In addition, it considers the polar case of actuarially fair insurance and the polar case of no insurance. I derive a general condition for debt neutrality. This condition depends explicitly on the degree of actuarial unfairness in insurance and on the extent to which parents care about the utility of their children.

## **Stock Volatility and the Crash of '87**

**G. William Schwert**

Working Paper No. 2954

May 1989

JEL Nos. 313, 211

This paper analyzes the behavior of stock return volatility using daily data from 1885 through 1987. The October 1987 stock market crash was unusual in many ways relative to prior history. In particular, stock volatility jumped dramatically during and after the crash, but it returned to lower, more nearly normal levels quickly. I use data on implied volatilities from call option prices and estimates of volatility from futures contracts on stock indexes to confirm this result.

## **Alternative Models for Conditional Stock Volatility**

**Adrian R. Pagan and G. William Schwert**

Working Paper No. 2955

May 1989

JEL Nos. 211, 132, 131

This paper compares several statistical models for monthly stock return volatility. The focus is on U.S. data from 1834–1925 because the post-1926 data have been analyzed in more detail by others. Also, the Great Depression had levels of stock volatility that are inconsistent with stationary models for conditional heteroskedasticity. We show the importance of nonlinearities in stock return behavior that are not captured by conventional ARCH or GARCH models. We also show the nonstationarity of stock volatility, even over 1834–1925.

## **Heteroskedasticity in Stock Returns**

**G. William Schwert and Paul J. Seguin**

Working Paper No. 2956

May 1989

JEL Nos. 210, 313

We use predictions of aggregate stock return variances from daily data to estimate time-varying monthly variances for portfolios ranked by size. We propose and estimate a single factor model of heteroskedasticity for portfolio returns. This model implies time-varying betas. Then, we document implications of heteroskedasticity and time-varying betas for tests of the capital asset pricing model. Accounting for heteroskedasticity increases the evidence that risk-adjusted returns are related to firm size. We also estimate a constant correlation model. Portfolio volatilities predicted by this model are similar to those predicted by more complex multivariate generalized autoregressive conditional heteroskedasticity (GARCH) procedures.

## **Business Cycles, Financial Crises, and Stock Volatility**

**G. William Schwert**

Working Paper No. 2957

May 1989

JEL Nos. 313, 131

This paper shows that stock volatility increased during recessions and financial crises from 1834–1987. The evidence reinforces the notion that stock prices are an important business cycle indicator. Using two different statistical models for stock volatility, I show that volatility increases after major financial crises. Moreover, stock volatility decreases and stock prices rise before the Fed increases margin requirements. Thus, there is little reason to believe that public policies can control stock volatility. The evidence also supports observation by Black (1976) that stock volatility increases after stock prices fall.

## **Foreign Investment and Technology Transfer: A Simple Model**

**Jian-Ye Wang and Magnus Blomström**

Working Paper No. 2958

May 1989

JEL Nos. 440, 610, 620

This paper develops a model in which the international transfer of technology through foreign direct investment is an endogenized phenomenon of equilibrium, resulting from the strategic interaction between subsidiaries of multinational corporations (MNCs) and host country firms. The model explicitly recognizes two types of costs—the costs to the MNC of transferring technology to its subsidiaries and the learning costs of domestic firms—and treats the transfer of technology in the context of game theory. The learning efforts of host country firms are important in increasing the rate at which MNCs transfer technology. The paper also explores some of the reasons why investment in learning in host country firms may be less than optimal.

## **Tariffs with Private Information and Reputation**

**Richard Jensen and Marie C. Thursby**

Working Paper No. 2959

May 1989

When governments choose trade policy, they rarely have complete information. When decisions are made,

policymakers have only estimates of market responses and responses of foreign governments. In many realistic situations, even the policy objectives of other governments may not be known.

This paper examines the Bayesian-Nash equilibriums of several noncooperative tariff games with incomplete information. In the models, the home country has private information about whether its government has low or high tariffs. If the foreign government is uncertain about this in a one-shot game, its Nash equilibrium tariff will be lower (higher) than if it knew the home government had a low (high) tariff. In two multistage games, misleading behavior by the home government is an equilibrium strategy for sufficiently high discount factors. Whether the uncertainty is persistent or can be resolved is important for welfare results in the multistage setting. In the models examined, tariff rules do not necessarily dominate discretionary policy.

## **An Econometric Analysis of Nonsynchronous Trading**

**Andrew W. Lo and A. Craig MacKinlay**  
Working Paper No. 2960  
May 1989  
JEL No. 520

We develop a stochastic model of nonsynchronous asset prices based on sampling with random censoring. In addition to generalizing existing models of nontrading, our framework allows the explicit calculation of the effects of infrequent trading on the time-series properties of asset returns. There are empirically testable implications for the variances, autocorrelations, and cross-autocorrelations of returns to individual stocks as well as to portfolios. We construct estimators to quantify the magnitude of nontrading effects in commonly used stock returns databases and show the extent to which this phenomenon is responsible for the recent rejections of the random-walk hypothesis.

## **Markets and Development**

**Joseph E. Stiglitz**  
Working Paper No. 2961  
May 1989  
JEL No. 321

This paper explores the causes and consequences of the more important market failures that impede the

development of LDCs and explains why the nonmarket institutions that often ameliorate the effects of market failures in developed countries are less effective in doing so in LDCs. In particular, I focus on those market failures that arise from imperfect information (as in the capital market) or that are associated almost inevitably with the learning that must occur if the LDCs are to make the successful transition to being more developed. The consequences of learning-by-doing, localized learning, and learning-to-learn include imperfections of competition, multiple equilibriums, hysteresis, and the optimality of nonmyopic policies.

These market failures are markedly different from those that were the center of attention in earlier literature that led to arguments for government planning. Government interventions need to recognize the source of market failures; informational problems affect the government no less than they do the private sector. In some cases, interventions should be directed at making markets work more effectively; in other cases, the government may take a role in establishing nonmarket institutions to ameliorate the effects of market failure.

## **The Long-Run Impact on Federal Tax Revenues and Capital Allocation of a Cut in the Capital Gains Tax Rate**

**Patric H. Hendershott and Yun Hi Won**  
Working Paper No. 2962  
May 1989  
JEL No. 323

We run model simulations to obtain a range of realistic estimates of the long-run revenue impact of a cut in the capital gains tax rate to a maximum of 15 percent. The basic vehicle for the simulations is a slightly modified version of the Galper-Lucke-Toder (GLT) general equilibrium model. The key behavioral assumptions affecting the estimates are: 1) the portfolio and tangible capital reallocations implicit in the structure of the GLT model; 2) corporate payout responses based on recent empirical estimates; and 3) illustrative noncorporate recharacterizations of regular income as capital gains.

The essential message of this paper is that the strong emphasis in the literature on the realization response to a cut in the capital gains tax rate has been appropriate. The effects on payout/recharacterization and portfolio redistribution/reallocation do not appear to be large. Moreover, the portfolio responses, within the context of the GLT model, act to raise tax revenues (substitution of taxable business capital for taxfree household and state and local capital), not lower them as has been conjectured. Thus these responses offset the payout/recharacterization effects, leaving the realization response basically as the total response. Of course, future research could modify this finding.



## **Crumbling Pillar? Declining Union Density in Japan**

**Richard B. Freeman and Marcus E. Rebick**

Working Paper No. 2963

May 1989

This paper seeks to understand the recent decline in union density in Japan from 35 percent in 1975 to 28 percent in 1987. We analyze this decline in terms of the changing proportion of workers in high and low unionization groups and the changes in density within those groups. Then using a stock-flow relationship, we look at how the organizing rate of new unions affects the overall density. A regression model assesses our interpretation of changes in Japanese density.

Our principal findings are: 1) Structural shifts in the composition of employment and in the demographics of the work force account for only a modest proportion of the drop in Japanese density. As in the United States, most changes in density occur within industries and among defined demographic groups of workers. 2) Much of the decline in density is associated with the inability of Japanese unions to organize new establishments. We attribute this in part to lowered worker interest and stiffened management opposition to unionism following the oil shock buttressed by unfavorable changes in the political and legal environment for collective bargaining and for union organization, and in part to other management actions, such as creating additional pseudomanagerial posts for older male workers.

## **Nonneutral Taxation and the Efficiency Gains of the 1986 Tax Reform Act—A New Look**

**Jane G. Gravelle**

Working Paper No. 2964

May 1989

The Tax Reform Act of 1986 considerably altered the differentials between taxes on corporate and noncorporate capital. Conventional wisdom, relying on various incarnations of the Harberger model, suggests rather small efficiency effects from these changes in corporate tax wedges. But the Harberger models appear to greatly understate the efficiency effects of changes in the corporate tax wedge because they do not admit production of the same good by both corporate and noncorporate firms.

A new model that allows corporate and noncorporate firms to coexist within the same industry suggests a significant efficiency gain from the Tax Reform Act.

The model predicts that the new law reduced excess burden by at least \$31 billion and eliminated about half of the total distortion from nonneutral taxation. Most of this gain occurs because the Tax Reform Act, while keeping the aggregate effective tax rate constant, considerably narrowed these differentials in industries in which there is substantial noncorporate production.

## **Trade Liberalization in General Equilibrium: Intertemporal and Interindustry Effects**

**Barry J. Eichengreen and Lawrence H. Goulder**

Working Paper No. 2965

May 1989

JEL Nos. 430, 441

This paper uses a dynamic computable general equilibrium model to simulate the effects of unilateral reductions by the United States in tariffs and "voluntary" export restraints (VERs). We consider 50 percent cuts in tariffs and in ad valorem VER equivalents, separately and in combination. The model features intertemporal optimization by households and firms, explicit adjustment dynamics, an integrated treatment of the current and capital accounts of the balance of payments, and industry disaggregation. We find that: 1) VERs are considerably more significant than tariffs in terms of the magnitude of the macroeconomic effects induced by their reduction; 2) while VER reductions enhance domestic welfare, unilateral tariff cuts reduce domestic welfare (as a consequence of U.S. monopsony power and associated adverse terms-of-trade effects); 3) international capital movements critically regulate the responses of the United States and foreign economies to these trade initiatives and produce significant differences between short and long-run effects; and 4) effects differ substantially across industries. Together, these findings indicate that simulation analyses that disregard international capital movements, adjustment dynamics, and industry differences may generate seriously misleading results.

## **Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz**

**Christina D. Romer and David H. Romer**

Working Paper No. 2966

May 1989

JEL Nos. 131, 311, 042

This paper uses the historical record to isolate episodes in which there were large monetary disturbances not caused by output fluctuations. It then tests

whether these monetary changes have important real effects. The central part of the paper is a study of post-war U.S. monetary history. We identify six periods in which the Federal Reserve in effect decided to attempt to create a recession to reduce inflation. We find that a shift to anti-inflationary policy led, on average, to a rise in the unemployment rate of two percentage points, and that this effect is highly statistically significant and robust to a variety of changes in specification.

We reach three other major conclusions. First, the real effects of these monetary disturbances are highly persistent. Second, the six shocks that we identify account for a considerable fraction of postwar economic fluctuations. Third, evidence from the interwar era also suggests that monetary disturbances have large real effects.

## **Labor Market Dynamics When Unemployment Is a Worker Discipline Device**

**Miles S. Kimball**

Working Paper No. 2967

May 1989

JEL No. 824

Efficiency wage models based on effort elicitation have important implications for labor market dynamics. These models have a wide array of discontinuous sunspot equilibriums driven by extraneous variables, in addition to well-behaved equilibriums characterized by continuous, slowly adjusting patterns of employment. Many aspects of actual labor markets can be replicated by these models. For example, the longer-run movements in employment that they predict allow macroeconomic evidence for a large labor supply elasticity to be reconciled with panel data evidence for a small labor supply elasticity. Many testable, but as yet untested, predictions about labor market dynamics also can be generated.

## **Layoffs and Lemons**

**Robert S. Gibbons and Lawrence F. Katz**

Working Paper No. 2968

May 1989

This paper analyzes an asymmetric-information model of layoffs in which the current employer is better

informed about workers' abilities than prospective employers are. The key feature of the model is that, when firms have discretion about whom to lay off, the market infers that laid-off workers are of low ability. Since no such negative inference should be attached to workers displaced in a plant closing, our model predicts that post-displacement wages will be higher for those displaced by plant closings than for those displaced by layoffs. Our model also predicts that the average post-displacement unemployment spell will be shorter for those displaced by plant closings than for those displaced by layoffs.

Our empirical work uses data from the Displaced Workers Supplements in the January 1984 and 1986 Current Population Surveys. We find evidence (both on reemployment wages and on post-displacement duration of unemployment) that is consistent with the idea that laid-off workers are viewed less favorably in the market than those losing jobs in plant closings. Our findings are much stronger for workers laid off from jobs where employers have discretion over whom to lay off.

## **High Tech Firms in Israeli Industry**

**Arie Bregman, Melvyn A. Fuss, and Haim Regev**

Working Paper No. 2969

May 1989

JEL Nos. 226, 621

This study characterizes and analyzes high technology industrial firms in Israel. We are able to advance beyond previous empirical studies of high technology because we have access to a unique individual firm dataset: a sample of 670 establishments in Israel for 1982. We have not only basic production data at the individual firm level but also each firm's capital stock revalued to 1982 dollars. We construct a technology index from three technological indicators: substantial R and D investment; a high proportion of the work force consisting of engineers and technicians; and a high proportion of the capital stock being of recent vintages. We use this technology index to classify firms. We find the highest concentration of high tech firms in electronics and transport equipment industries, and the lowest in textiles and clothing. High tech firms appear to be more productive, to pay higher wages, and to earn higher rates of return. Part of the higher wages to high tech workers accrue in the form of rents: workers in these firms expropriate a portion of monopoly profits, a phenomenon that does not appear to be the case for low tech firms.

## **Growth and Welfare in a Small Open Economy**

**Gene M. Grossman and Elhanan Helpman**

Working Paper No. 2970

May 1989

JEL Nos. 422, 111, 621

We construct a model of growth based on endogenous technological change in a small open economy. Entrepreneurs develop new intermediate products whenever the present value of potential profits exceeds the cost of R and D. Diversity of intermediates contributes to total factor productivity in the production of final goods. The economy produces two such final goods and trades them at exogenously given world prices.

We then study the welfare implications of R and D subsidies and commercial policy. There is an optimal subsidy to R and D that speeds growth relative to the market-determined rate. The optimal subsidy achieves the first-best rate of growth, but not the first-best level of welfare. Small tariffs and export subsidies also affect both growth and welfare. Growth may increase or decrease, depending upon which sector is promoted by the trade policy. But an increase in the growth rate is neither necessary nor sufficient for a trade policy to improve welfare. Finally, we compare tariffs and quotas, when the latter give rise to rent-seeking behavior. The diversion of resources from innovative activities to rent seeking can have dire implications for growth and welfare.

## **History versus Expectations**

**Paul R. Krugman**

Working Paper No. 2971

May 1989

JEL No. 400

In models with external economies, there are often two or more long-run equilibriums. Which equilibrium is chosen? Much of the literature presumes that "history" sets initial conditions that determine the outcome, but an alternative view stresses the role of "expectations," that is, of self-fulfilling prophecies. This paper uses a simple trade model with both external economies and adjustment costs to show how the parameters of the economy determine the relative importance of history versus expectations in determining equilibrium.

## **Is Bilateralism Bad?**

**Paul R. Krugman**

Working Paper No. 2972

May 1989

JEL No. 400

In the 1980s the process of trade liberalization through multilateral negotiation seems to have run aground. In its place there have been a number of bilateral and regional moves toward liberalization. There has been some concern that these local deals, by undermining the multilateral process, actually may reduce world trade and welfare.

This paper develops a simple model of the effects of regional trading blocs and shows that consolidation of the world into a smaller number of such blocs indeed may reduce welfare, even when each bloc acts to maximize the welfare of its members. For all plausible parameter values, world welfare is minimized when there are three trading blocs. More complex versions of the model offer softer results but still validate concern over the effects of bilateral and regional trade deals.

## **Research and Development as an Investment**

**Bronwyn H. Hall and Fumio Hayashi**

Working Paper No. 2973

May 1989

JEL Nos. 621, 522, 212

About 20 percent of the gross investment expenditures of U.S. manufacturing firms is expenditures on research and development. Like investment in physical capital, R and D responds to news about future prospects of the firm, such as profitability, technological opportunities, or changes in factor prices. Using data from a panel of large U.S. manufacturing firms that was developed within the Productivity Program of the NBER, we investigate the differential responses of these two types of investment to changes in the value of the firm's assets as perceived by financial markets and the interaction of these responses.

In order to study this topic empirically, we develop a stochastic dynamic programming model of a firm with two types of capital (physical and knowledge capital) that are used to produce profits. The model distinguishes between the accumulation of the two kinds of capital: expenditures on the physical capital stock are incurred one or more years before the capital actually becomes productive, whereas R and D capital is produced jointly as a function of current expenditure and the past technological position of the firm. We consider two individ-

ual firm-specific shocks: one to the overall profitability of the firm and one to the "productivity" of R and D. In the empirical estimates, we find that these two shocks account for about 20 percent of the total variance in net investment, 15 percent of the variance in the firm-level R and D-to-capital ratio, but only about 5 percent of the annual rates of return. The profitability shock is well described by a moving average process of order three, while the technology shock process is more nearly permanent: first-order autoregressive with parameter near unity.

## **Patents, Appropriate Technology, and North-South Trade**

**Ishac Diwan and Dani Rodrik**

Working Paper No. 2974

May 1989

JEL No. 420

We consider the differential incentives of the North and South to provide patent protection to innovating firms in the North. The two regions are assumed to have a different distribution of preferences over the range of exploitable technologies. Because of the scarcity of R and D resources, the two regions are in potential competition with each other to encourage the development of technologies most suited to their needs. This provides a motive for the South to provide patent protection even when it constitutes a small share of the world market and hence has strong incentives to ride free. A benevolent global planner will set equal rates of patent protection only when it weights the welfare of the two regions equally.

We find that the comparative statics of the Nash equilibrium exhibit considerable ambiguity. Numerical simulations show that: 1) when the technological preferences of the two countries become more similar, the level of patent protection provided by the South is reduced; and 2) when the relative market size of the South is increased, the South enhances its patent protection. In both cases, the level of northern patents is relatively insensitive.

## **Dividends, Capital Gains, and the Corporate Veil: Evidence from Britain, Canada, and the United States**

**James M. Poterba**

Working Paper No. 2975

May 1989

JEL Nos. 323, 521

This paper investigates the effects on the level of aggregate consumption of increased cash dividend

payout and of "forced realizations" of capital gains in corporate control transactions. The results suggest that investors respond differently to cash receipts from firms and to accruing capital gains. Consistent but weak evidence for the United States, Great Britain, and Canada suggests that higher tax rates on dividends lower consumption. This is consistent with such tax rates increasing corporate saving, while households fail to pierce the corporate veil completely and therefore reduce their consumption. Time-series evidence from the United States and the United Kingdom also suggests that "forced realizations" of capital gains in takeovers may spur consumption, indicating a relatively unexplored link between corporate financial decisions and aggregate consumption.

## **Macroeconomic Implications of Production Bunching: Factor Demand Linkages**

**Russell Cooper and John C. Haltiwanger**

Working Paper No. 2976

May 1989

JEL Nos. 023, 131

The literature on inventory holdings stresses their role in smoothing production when costs are convex. Existing empirical evidence suggests that output is more variable than consumption so that production smoothing apparently is *not* present. One way of explaining this finding is to allow for nonconvex technologies. In this paper we investigate some macroeconomic implications of the proposition that at least some firms in the economy produce with nonconvex technologies.

We begin our analysis by studying a simple Robinson Crusoe economy with a single, storable good that is produced with a nonconvex technology. The single agent can produce a finite amount of output simply by incurring a fixed production cost. We demonstrate that the efficient solution to this problem will entail periods of production followed by periods of inactivity: that is, production will be bunched rather than smoothed. More importantly, inventories will be used to smooth consumption relative to this production path. Still, as long as the agent discounts the future, or inventories depreciate over time, consumption will not be totally smooth. Instead, consumption will be highest in periods of production. Thus, the nonconvex technology will induce fluctuations in both production and consumption.

Using this analysis as a starting point, we consider the implications of a nonconvex technology in one sector of the economy for the behavior of other sectors through intersectoral technological linkages for both centralized and decentralized economies. For the centralized setting, the extent to which nonconvexities spill over to other sectors depends on the degree to which intermediate and final goods can be inventoried

and the nature of the technological interaction between factors. For the decentralized economy, the production of inputs that are strategic complements (substitutes) will be synchronized (staggered). Thus the presence of strategic complementarities (as in imperfectly competitive markets) will imply that nonconvexities will have aggregate implications.

## **When Are Contrarian Profits Due to Stock Market Overreaction?**

**Andrew W. Lo and A. Craig MacKinlay**

Working Paper No. 2977

May 1989

JEL No. 520

The profitability of contrarian investment strategies need not be the result of stock market overreaction. Even if returns on individual securities are temporally independent, portfolio strategies that attempt to exploit return reversals still may earn positive expected profits. This is because of the effects of cross-autocovariances from which contrarian strategies inadvertently benefit. We provide an informal taxonomy of return-generating processes that yield positive (and negative) expected profits under a particular contrarian portfolio strategy and use this taxonomy to reconcile the empirical findings of weak negative autocorrelation for returns on individual stocks with the strong positive autocorrelation of portfolio returns. We present empirical evidence against overreaction as the primary source of contrarian profits and show the presence of important lead-lag relationships across securities.

## **Measuring Nontariff Trade Policies**

**Robert E. Baldwin**

Working Paper No. 2978

May 1989

JEL No. 420

This paper evaluates various nontariff trade measures (NTMs) to determine which might best facilitate a reduction in the trade-distorting effects of such policies through multilateral negotiations. I analyze measures of price impact, quantity impact, frequency, and welfare. My general conclusion is that reasonable measures of nontariff policies exist, which are useful for assessing relative sectorial protection across countries and monitoring changes in protection and subsidization levels over time. Tariff and subsidy equivalents, preferably determined by directly comparing distorted and nondistorted prices, are the most useful forms of measurement. They focus on the price-distorting effects

of NTMs and are also familiar to both public and private officials. However, other types of measures can be valuable in supplementing the information obtained from tariff and subsidy equivalents.

## **Incentives, Information, and Organizational Design**

**Joseph E. Stiglitz**

Working Paper No. 2979

May 1989

JEL No. 053

This paper explores the interaction among incentives, information, and organizational design. I argue that the virtues of the market economy do not lie so much in the vision of competition and decentralization embodied in the Arrow-Debreu model, or the Lange-Lerner-Taylor analysis of market socialism. Rather they lie in those more recent models that analyze competition as contests (Nalebuff-Stiglitz, Lazear-Rosen) and decentralization as a structure of decisionmaking, in environments in which imperfect information is dispersed among numerous individuals (humans are fallible) and accordingly, some method of aggregation has to be found. The traditional model exaggerates the virtues of the market: whenever markets are incomplete and information is imperfect, market allocations are almost never constrained to be Pareto efficient. It also understates its virtues: the ability to solve the problems of selection, incentives, and information-gathering and aggregation that are the core problems in organizational design. I show how this alternative perspective provides insights into the role of time in resource allocation. For example, there are patent (R and D) races as well as races to be the first to enter a market. This explains, for instance, why most economies abandon reliance on market mechanisms in times of economic crisis, such as wars.

## **Why Haven't Debtor Countries Formed a Cartel?**

**Raquel Fernandez and Jacob Glazer**

Working Paper No. 2980

May 1989

JEL Nos. 026, 433

We ask whether there are strategies whereby countries can sustain a cartel, or collusive behavior, when

bargaining with a bank over the amount of debt to be repaid. We show that despite the existence of economies to scale in bargaining—if commitment were possible, the countries would benefit from joint bargaining—a debtors' cartel will not emerge in equilibrium (in the absence of credible commitment mechanisms). A unique subgame-perfect equilibrium exists in which the bank is effectively able to isolate each country and extract from each the same payoff that it would obtain in the absence of economies to scale. Consequently, a country would be better off if another country declared default. We also show that if two countries of unequal size are bargaining with a bank, in equilibrium a decrease in the size of the smaller country implies a greater payoff to the large country although the payoff to the small country is invariant.

## **Sovereign-Debt Renegotiations Revisited**

**Raquel Fernandez and Robert W. Rosenthal**

Working Paper No. 2981

May 1989

JEL Nos. 026, 433

The literature on sovereign debt often has assumed implicitly that all the power in the bargaining game between debtor and creditor lies with the creditor. An earlier paper provided a game-theoretic basis for this contention, in that all the subgame-perfect equilibriums of the game modeled have an extreme form in which the game's surplus is captured by the creditor. Here we analyze two related games. Equilibriums in which the debtor captures some of the surplus exist in one of them but not the other. We examine the roles of various assumptions in all three games.

## **New Classicals and Keynesians, or the Good Guys and the Bad Guys**

**Robert J. Barro**

Working Paper No. 2982

May 1989

JEL Nos. 023, 130, 110

Old-style Keynesian models relied on sticky prices or wages to explain unemployment and to argue for

demand-side macroeconomic policies. This approach increasingly relied on a Phillips-curve view of the world and therefore lost considerable prestige with the events of the 1970s. The new classical macroeconomics began at about that time and focused initially on the apparent real effects of monetary disturbances. Despite initial successes, this analysis ultimately was unsatisfactory as an explanation for an important role of money in business fluctuations. Nevertheless, the approach achieved important methodological advances, such as rational expectations and new methods of policy evaluation. Subsequent research by new classicals has deemphasized monetary shocks and focused instead on real business cycle models and theories of endogenous economic growth. These areas appear promising at this time. Another development is the so-called new Keynesian economics, which includes long-term contracts, menu costs, efficiency wages and insider-outsider theories, and macroeconomic models with imperfect competition. Although some of these ideas may prove helpful as elements in real business cycle models, my main conclusion is that the new Keynesian economics has not been successful in rehabilitating the Keynesian approach.

## **Changes in the Structure of Wages during the 1980s: An Evaluation of Alternative Explanations**

**John Bound and George E. Johnson**

Working Paper No. 2983

May 1989

JEL No. 824

Between 1979 and 1987 there were three significant changes in the wage structure in the United States. The pecuniary returns to schooling increased by about one-third; the wages of older relative to younger workers with relatively low education increased to some extent; and the wages of women relative to men rose by almost 10 percent. It is important for policy purposes to know *why* these changes occurred and whether they are temporary or permanent. This paper investigates several alternative explanations of these wage structure phenomena, including the most popular ones—that their principal causes were: shifts in the structure of product demand; skilled-labor-saving technological change; and changes in the incidence and level of rents received by lower-skilled workers. Our reading of the evidence suggests that the major cause of the dramatic movements in the wage structure during the 1980s may have been some combination of changes in both production technology and the average relative nonobserved quality of different labor groups.

## Long-Term Memory in Stock Market Prices

**Andrew W. Lo**

Working Paper No. 2984

May 1989

JEL No. 520

This paper develops a test for long-run memory that is robust to short-range dependence. It is a simple extension of Mandelbrot's "range over standard deviation" (R/S) statistic, for which the relative asymptotic sampling theory is derived via functional central limit theory. This test is applied to daily, weekly, monthly, and annual stock returns indexes over several different time periods. Contrary to previous findings, there is no evidence of long-range dependence in any of the indexes over any sample period or subperiod once short-term autocorrelations are taken into account. Illustrative Monte Carlo experiments indicate that the modified R/S test has power against at least two specific models of long-run memory, suggesting that stochastic models of short-range dependence may capture the time-series behavior of stock returns adequately.

## Index of U.S. Stock Prices from 1802 to 1987

**G. William Schwert**

Working Paper No. 2985

May 1989

JEL Nos. 042, 227, 313

I compare monthly stock returns from Smith and Cole (1935), Macaulay (1938), and Cowles (1939) with the returns to the CRSP value and equal-weighted portfolios of New York Stock Exchange (NYSE) stocks. I also compare daily stock returns from Dow Jones (1972) and Standard & Poors (1986) with the returns to the CRSP value and equal-weighted portfolios of NYSE and American Stock Exchange stocks. After analyzing the effects of dividends, nonsynchronous trading, and time-averaging, I splice the best indexes and derive monthly data from 1802–1987 (2227 observations) and daily data from 1885–1987 (28,884 observations).

## The Macroeconomics of Populism in America

**Rudiger Dornbusch and Sebastian Edwards**

Working Paper No. 2986

May 1989

JEL No. 430

Macroeconomic populism emphasizes growth and income distribution and deemphasizes the risks of in-

flation and deficit finance, external constraints, and the reaction of economic agents to aggressive non-market policies. Our paper shows that policy experiences in different countries and periods share common features, including the initial conditions, the motivation for policies, the argument that the country's conditions are different, and the ultimate collapse. We describe Chile under Allende and Peru under Garcia, not to assert conservative economics, but rather to warn that populist policies ultimately fail; when they fail, it is always at a frightening cost to the very groups who were supposed to be favored. Our central thesis is that the *macroeconomics* of various experiences is much the same, even if the politics differ greatly.

## Why Do Multinational Firms Seek Out Joint Ventures?

**Magnus Blomström and Mario Zejan**

Working Paper No. 2987

May 1989

JEL Nos. 440, 610

Using a model of dichotomous choice, we distinguish the characteristics of Swedish multinational firms that seek out joint ventures from those that do not. Firms with little experience of foreign production and with highly diversified product lines are most likely to share equity. In general, multinational firms that have the most to offer the developing countries are reluctant to enter into joint venture agreements. Therefore, imposing joint venture status on multinationals may prevent the inflow of advanced technologies.

## Sleep and the Allocation of Time

**Jeff E. Biddle and Daniel S. Hamermesh**

Working Paper No. 2988

May 1989

JEL Nos. 821, 841

Sleep is subject to choice and affected by the same economic variables that affect other uses of time. Using aggregated data for 12 countries, a cross-section of microeconomic data, and a panel of households, we demonstrate that increases in time spent in the labor market reduce sleep time. Each additional hour of market work reduces sleep by roughly 10 minutes (and waking nonmarket time by 50 minutes). The total time available for work and leisure thus is itself subject to



choice. Interestingly, too, otherwise identical women sleep significantly less than men (even though the average woman sleeps slightly more).

We develop a theory of the demand for sleep that differs from standard models. It assumes that sleep affects wages through its impact on labor market productivity. Estimates of a system of demand equations demonstrate that higher wage rates reduce sleep time among men, an effect that is entirely offset by the positive effect of wages on waking nonmarket time. Among women, the wage effect on waking nonmarket time is negative and small, but the effect on sleep is negative and quite large. These results, and the model they are based on, allow a more subtle interpretation of standard results in the labor supply literature.

### **Municipal Construction Spending: An Empirical Examination**

**Douglas Holtz-Eakin and Harvey S. Rosen**

Working Paper No. 2989

May 1989

JEL No. 324

Despite widespread concern and discussion, there is no consensus about the causes of the "infrastructure crisis." We investigate several models of the determination of local public capital expenditures. Using Euler equation methods, we find that construction spending may be determined by unconstrained, forward-looking municipal planning. We also find that the stochastic structure of revenue and grant flows is important in determining construction spending. Only *unanticipated* changes in a community's resources alter its demand for structures. An unanticipated increase in resources of one dollar increases current construction spending by about 5.5 cents.

### **Did ACRS Really Cause Stock Prices to Fall?**

**Andrew B. Lyon**

Working Paper No. 2990

May 1989

JEL No. 323

This paper asks whether the introduction of the Accelerated Cost Recovery System (ACRS) in 1981 reduced stock prices by reducing the value of existing capital and whether these depreciation changes benefited firms by increasing the return from new investment. I evaluate stock returns during the period surrounding enactment of this legislation with data on capital stock and investment for over 800 firms. Neither the ACRS nor depreciation changes appear to determine cross-sectional differences in returns during this period.

### **Why Do World War Veterans Earn More Than Nonveterans?**

**Joshua D. Angrist and Alan B. Krueger**

Working Paper No. 2991

May 1989

JEL No. 824

Veterans of World War II are believed to earn more than nonveterans of the same age. Theoretical justifications for this wage premium include the subsidization of education and training and preference for veterans in hiring. In this paper, we propose and test an alternative view: that the observed premium for World War II veterans reflects the fact that men with higher earnings potential were more likely to have been selected into the armed forces. We develop an empirical strategy that allows estimation of the effects of veteran status while controlling for correlation with unobserved earnings potential. The estimation is based on the fact that from 1942 to 1947, priority for conscription was determined in chronological order of birth. Information on individuals' dates of birth therefore may be used to construct instruments for veteran status. Empirical results from the 1960, 1979, and 1980 Censuses, along with two other microdatasets, support a conclusion that World War II veterans earn no more than comparable nonveterans, and may well earn less. These results suggest that OLS estimates of the World War II veteran premium are severely biased by nonrandom selection into military service, and that the civilian labor market experiences of veterans of World War II were not very different from the experiences of veterans of the Vietnam era.

### **The Sources of Fluctuations in Aggregate Inventories and GNP**

**Kenneth D. West**

Working Paper No. 2992

June 1989

JEL No. 131

How did cost and demand shocks interact to cause fluctuations in aggregate GNP and inventories in the United States between 1947 and 1986? Cost shocks appear to be the predominant source of fluctuations in inventories and are largely responsible for the fact that GNP is more variable than final sales. Cost and demand shocks are roughly equally important for GNP. However, these estimates are imprecise. With a different, but plausible, value for a certain target inventory-sales ratio, cost shocks are less important than demand shocks for GNP fluctuations.

## **Unraveling the Productivity Growth Slowdown in the United States, Canada, and Japan: The Effects of Subequilibrium, Scale Economies, and Markups**

**Catherine J. Morrison**  
Working Paper No. 2993  
June 1989  
JEL Nos. 600, 620

Measures of productivity growth typically include in the productivity "residual" the impacts of subequilibrium from fixity of factors, costs of adjustment, returns to scale, and markups. This paper proposes a general two-part framework for adjusting the residual measure to take these impacts into account. First, I correct errors in computing the weights on output and quasi-fixed input growth in traditional measures for both primal- and cost-side measures. Then I use the deviation of revenues from costs to decompose the full primal measure and identify the differential influences of technical change, utilization functions, scale economies, and price margins. I use this framework empirically for the U.S., Japanese, and Canadian manufacturing sectors, with an econometric model that allows explicit incorporation and measurement of these influences. The adjusted measures show that a significant amount of cyclical and secular change in measured productivity growth can be attributed to production characteristics other than technical change, particularly scale economies.

## **Corporate Savings and Shareholder Consumption**

**Kevin Hassett and Alan J. Auerbach**  
Working Paper No. 2994  
June 1989  
JEL Nos. 320, 520

This paper reexamines the implications of changing corporate savings, testing for the presence of a "corporate veil." We argue that previous tests for such a veil have lacked proper focus, identifying influences of corporate saving on private saving that are entirely consistent with a complete piercing of the corporate veil.

We formulate two tests. Based on the first test, we find that wealth-neutral changes in corporate dividend policy do not significantly affect aggregate consumption. This suggests that no corporate veil exists. Second, we find the aggregate consumption response to changes in corporate wealth to be close to zero. This is consistent with the presence of a veil, but also with heterogeneity in the population with respect to consumption behavior.

## **Tying, Foreclosure, and Exclusion**

**Michael D. Whinston**  
Working Paper No. 2995  
June 1989  
JEL No. 610

Tied sales have a long history of scrutiny under the antitrust laws of the United States. The primary basis for the condemnation of this practice has been the court's belief in what has come to be known as the "leverage theory" of tying: that is, tying provides a mechanism whereby a firm with monopoly power in one market can use the leverage provided by this power to foreclose sales in, and thereby monopolize, a second market. In recent years, however, the leverage theory has come under heavy attack. In this paper, I reconsider the leverage hypothesis. I argue that, in an important sense, the models used by the critics of the leverage theory—all of which assume that the tied good market has a competitive, constant returns-to-scale structure—are incapable of addressing the central concern of the leverage theory, that tying can be used profitably to change the market structure of the tied good market. I then demonstrate that when the tied good market has an oligopolistic structure, tying can indeed serve as a mechanism for leveraging market power through the foreclosure of tied market rivals' sales.

## **Optimal Taxation with Costly Enforcement and Evasion**

**Louis Kaplow**  
Working Paper No. 2996  
June 1989  
JEL No. 323

This paper analyzes the relationship between optimal taxation, in which the literature considers raising revenue with minimum distortion, and optimal tax enforcement, in which much of the literature emphasizes raising revenue at the least cost. A central question concerns the extent to which revenue should be raised through higher tax rates, which distort behavior, or greater enforcement, which distorts behavior because it raises marginal effective tax rates and also entails direct resource costs. I demonstrate that, under each of several assumptions about evasion and enforcement, some expenditure on enforcement is optimal despite its resource cost, its distortionary effect, and the availability of other revenue sources that have no enforcement costs. I derive rules for optimal tax rates and enforcement expenditures, which also indicate the marginal cost of government funds and optimal enforcement priorities for a tax collection agency.

## **Self-Reported versus Objective Measures of Health in Retirement Models**

**John Bound**

Working Paper No. 2997

June 1989

JEL Nos. 813, 913, 915, 918

Estimates of labor supply are sensitive to the measures of health used. When self-reported measures are used, health seems to play a larger role, and economic factors a smaller one, than when more objective measures are used. While most authors have interpreted these results as an indication of the biases inherent in using self-reported measures, there are also reasons to be suspicious of estimates based on more objective measures. In this paper, I construct a statistical model incorporating both self-reported and objective measures of health. I use the model to show the potential biases involved in using either measure of health, or in using one to instrument the other. When outside information on the validity of self-reported measures of health is incorporated into the model, estimates suggest that the self-reported measures of health perform better than many have believed.

## **Stochastic Process Switching: Some Simple Solutions**

**Kenneth A. Froot and Maurice Obstfeld**

Working Paper No. 2998

June 1989

JEL No. 431

When changes in the economic policy regime occur stochastically, asset prices will reflect the possibility of such shifts. In this paper, we apply techniques of regulated Brownian motion to obtain closed-form analytic price solutions when policy reaction functions are subject to prospective changes. We focus on the case in which the authorities promise to peg a currency's exchange rate once it reaches a predetermined future level. We also show how an open-ended commitment to exchange rate targeting may lead to multiple equilibriums.

## **Policy Uncertainty and Private Investment in Developing Countries**

**Dani Rodrik**

Working Paper No. 2999

June 1989

JEL No. 110

A resurgence in private investment is necessary for sustainable recovery in heavily indebted developing

countries. Policy reforms in these countries present a serious dilemma, especially when they include structural and microeconomic features. On the one hand, for the new policies to be successful, entrepreneurs, workers, and farmers must respond to the signals generated by the reform. On the other hand, rational behavior by the private sector calls for withholding investment until much of the residual uncertainty regarding the eventual success of the reform is eliminated. This paper shows that even moderate amounts of policy uncertainty can act as a hefty tax on investment, and that otherwise sensible reforms may prove damaging if they induce doubts as to their permanence. I develop a simple model to link policy uncertainty to the private investment response.

## **Do Managerial Objectives Drive Bad Acquisitions?**

**Randall Mørck, Andrei Shleifer, and Robert W. Vishny**

Working Paper No. 3000

June 1989

JEL Nos. 512, 611

For a sample of 327 U.S. acquisitions between 1975 and 1987, this paper documents three forces that systematically reduce the return of bidding firms on announcement day. The returns to bidding shareholders are lower: 1) when their firm diversifies; 2) when it buys a rapidly growing target; and 3) when the performance of its managers has been poor before the acquisition. These results are consistent with the proposition that managerial, rather than shareholders', objectives drive bad acquisitions.

## **Data-Snooping Biases in Tests of Financial Asset Pricing Models**

**Andrew W. Lo and A. Craig MacKinlay**

Working Paper No. 3001

June 1989

JEL Nos. 520

We investigate the extent to which tests of financial asset pricing models may be biased by using properties of the data to construct the test statistics. Specifically, we focus on tests using returns to portfolios of common stock in which portfolios are constructed by sorting on some empirically motivated characteristic of the securities such as market value of equity. We

present both analytical calculations and Monte Carlo simulations that show the effects of this type of data-snooping to be substantial. Even when the sorting characteristic is only marginally correlated with individual security statistics, 5 percent tests based on sorted portfolio returns may reject with probability one under the null hypothesis. This bias is shown to worsen as the number of securities increases given a fixed number of portfolios, and as the number of portfolios decreases given a fixed number of securities. We provide an empirical example that illustrates the practical relevance of these biases.

## **The Impact of a Ban on Legalized Abortion on Adolescent Childbearing in New York City**

**Theodore J. Joyce and Naci H. Mocan**  
Working Paper No. 3002  
June 1989  
JEL No. 841

This paper attempts to forecast the change in adolescent childbearing among New York City residents following a ban on legalized abortion. With monthly data on the number of births to white and black adolescents from January 1963 to December 1987, we use an interrupted time-series analysis to estimate the change in adolescent childbearing that followed the liberalization of the New York state abortion law in 1970. We find that the level of births to black adolescents living in New York City fell 18.7 percent between 1970 and 1971, or by approximately 142 births per month. The level of white births fell 14.1 percent or by approximately 111 births per month. We then applied the absolute value of the percentage changes in births between 1970 and 1971 to the forecasted number of monthly births in 1988 and 1989. If legal abortion had been inaccessible to New York City adolescents beginning on January 1, 1988, there would have been 2143 black and 1067 white unintended births to teenagers in the first two years of the ban. Our results suggest that a prohibition on legalized abortion would have a substantial increase in adolescent childbearing across the United States, although the magnitude of the change would vary according to local conditions.

## **The Euromarkets After 1992**

**Richard M. Levich**  
Working Paper No. 3003  
June 1989  
JEL No. 430

Over the last three decades, differential national regulation together with increasing capital mobility have

given rise to tremendous growth in the Eurocurrency markets. In this paper, I analyze whether the effect of announced plans of the European Commission to remove barriers to capital flows (in July 1990) and to harmonize other financial regulations (by the end of 1992) on the Euromarkets.

This paper revolves around the concept of the Net Regulatory Burden (NRB). Three variables will play a crucial role for the development of the Euromarkets after 1992: 1) reserve requirements on bank deposits; 2) taxation of residents and nonresidents on interest income, dividends, and capital gains; and 3) disclosure of interest and dividends to tax authorities. There is presently considerable variation in these factors across Europe. Competitive pressures should lead to a convergence of regulation, but national sovereignty leaves open the possibility of some divergence of the NRB across European countries and in comparison with other financial centers, such as Switzerland. These differences in NRB will play a key role in determining the location and size of Euromarkets after 1992.

## **Building Blocks of Market-Clearing Business Cycle Models**

**Kevin M. Murphy, Andrei Shleifer,**  
and **Robert W. Vishny**  
Working Paper No. 3004  
June 1989  
JEL No. 131

We compare "real business cycle" models with increasing-returns models of economic fluctuations. In these models, business cycles are driven by productivity changes resulting either from technology shocks or from movements along the increasing-returns production function. We stress four crucial building blocks that give both types of models hope of fitting the data: durability of goods; specialized labor; imperfect credit; and elastic labor supply. We also present new evidence on comovement of outputs and labor inputs across sectors and on the behavior of relative prices over the business cycle. We conclude that the increasing-returns model is easier to reconcile with the data than the real business cycle model.

## **Legal Advice About Acts Already Committed**

**Louis Kaplow and Steven Shavell**  
Working Paper No. 3005  
June 1989  
JEL Nos. 026, 916

Much legal advice is provided after individuals have committed acts—when they come before a tribunal—

rather than when they decide how to act. This paper considers the effects and social desirability of such legal advice. We emphasize that legal advice tends to reduce expected sanctions, which may encourage acts that are subject to sanctions. However, there is no a priori basis for believing that this is socially undesirable because, among other reasons, it may be possible to raise the level of sanctions high enough to offset their dilution because of legal advice. In addition, legal advice does not generally improve the effectiveness of the legal system through its influence on the information presented to tribunals.

## **Government Relief for Risk Associated with Government Action**

**Louis Kaplow**

Working Paper No. 3006

June 1989

JEL Nos. 026, 323, 916

Uncertainty concerning future government policy is a significant source of risk. Government action—tax reform, deregulation, judicial decisions, budgetary shifts—produces gains and losses for those who had invested under preexisting rules. I examine the effects of government relief—compensation, grandfathering, phase-ins—on ex ante incentives and risk bearing in a model that considers private insurance. I demonstrate that government relief is inefficient, even when private insurance is subject to moral hazard, because relief shields individuals from some of the effects of their actions.

## **Incentives and Government Relief for Risk**

**Louis Kaplow**

Working Paper No. 3007

June 1989

JEL Nos. 026, 323, 911

Government relief is offered for a wide range of risks: natural disaster, economic dislocation, sickness, and injury. This paper explores the effect of such relief on incentives and on the allocation of risk in a model with private insurance. I show that government relief is inefficient, even when its level is less than the private insurance coverage that individuals otherwise would have purchased and even when private insurance coverage is incomplete because of problems of moral hazard.

## **The Optimal Probability and Magnitude of Fines for Acts That Are Definitely Undesirable**

**Louis Kaplow**

Working Paper No. 3008

June 1989

JEL No. 916

Even when society wishes to deter all acts of some type, such as tax evasion or many common crimes, the benefits from deterrence are often insufficient to justify the expenditures on enforcement that would be required to deter everyone. However, if some individuals are not deterred, they will bear risk when fines are employed as a sanction. As a result, it may be optimal to reduce total risk-bearing costs by reducing the number of individuals who bear any risk. This can be accomplished by increasing enforcement above the level that would be justified based only on the benefits of deterrence and the direct costs of enforcement. It also may be optimal to reduce the risk borne by those who act by employing fines below the maximum feasible level. The latter possibility constitutes one instance in which the well-known implication of Becker's analysis—that it is optimal to employ extreme sanctions for all offenses—is invalid.

## **Inflation Insurance**

**Zvi Bodie**

Working Paper No. 3009

June 1989

JEL No. 520

A contract to insure one dollar against inflation is equivalent to a European call option on the consumer price index (CPI). When there is no deductible, this call option is equivalent to a forward contract on the CPI. Its price is the difference between the prices of a zero coupon real bond and a zero coupon nominal bond, both free of default risk. Provided that the risk-free real rate of interest is positive, the price of such an inflation insurance policy first rises and then falls with time to maturity. It is a decreasing function of the real interest rate and an increasing function of both the expected rate of inflation and the real risk premium on nominal bonds.

When a deductible is introduced, the insurance policy no longer can be priced like a CPI forward contract.

The option feature has its greatest value when the deductible is close to the forward rate of inflation, defined as the difference between the risk-free nominal and real interest rates. Such inflation insurance contracts are priced using the model developed by Black-Merton-Scholes. Pricing an inflation insurance policy with a cap requires only a minor modification of the model.

The approach presented in this paper permits fairly precise quantification of the cost of implementing proposals to index pension benefits for inflation. It also gives us a way of estimating the savings to the Social Security system that would result from introducing a deductible.

### **Reforming Conforming Loan Limits: The Impact on Thrift Earnings and Taxpayer Outlays**

**Patric H. Hendershott and James D. Shilling**

Working Paper No. 3010

June 1989

JEL Nos. 313, 323

In recent years, the conforming loan limit has risen rapidly (62 percent from 1985-9 versus a 10 percent rise in the price of a constant-quality new house) and has assumed significant importance to homebuyers and portfolio lenders. Fannie Mae and Freddie Mac have become the price-setters for conforming fixed rate mortgages (FRMs), and the yield being set appears to be 30 basis points below what it otherwise would be. The lower yield raises the old issue of over-investment in housing, but its most important effect is on thrifts who now earn 30 basis points less on FRM investments under the conforming limit and who have difficulty originating adjustable rate mortgages. Moreover, given other thrift problems, taxpayers apparently will end up directly funding the interest income lost because of low yields on conforming FRMs.

In this paper, we calculate the impact on thrift interest income of two redefinitions of conforming loans: 1) making all refinancings conforming; and 2) lowering the loan limit to the loan ceiling for FHA/VA loans (which was, in fact, the conforming limit prior to 1975). Each of these redefinitions makes sense from a public policy perspective. Thrifts would have earned nearly \$700 million more in 1987 if both redefinitions had been in place at the beginning of 1986. This would have amounted to a 23 percent increase in the industry net operating income (income excluding profits or losses from the sale of assets) and a corresponding increase in return to equity. By the early 1990s, the income gain from these changes, had they been put in place in early 1986, would likely be over a billion dollars—certainly a noticeable saving for taxpayers.

### **The Lender of Last Resort: Some Historical Insights**

**Michael D. Bordo**

Working Paper No. 3011

June 1989

JEL Nos. 311, 041

This paper discusses the role for a lender of last resort (LLR) in preventing banking panics, then briefly considers classical and more recent concepts of the LLR. I examine historical evidence for the United States and other countries on bailouts, the incidence of banking panics and LLR actions, and the record of alternative LLR arrangements in the United States, Scotland, and Canada.

### **Bonuses, Overtime, and Employment: Korea versus Japan**

**Takatoshi Ito**

Working Paper No. 3012

June 1989

JEL Nos. 824, 833

This paper examines bonus and wage behavior in Korea. I find that both bonuses and wages in Korea respond to economic conditions much more than their counterparts in Japan do. This may reflect the fact that the Korean labor market is much closer to a spot market than to a long-term contract (lifetime employment) market. Hence, the bonus/wage ratio apparently is insensitive to economic conditions in Korea, unlike in Japan (Freeman and Weitzman). When the "overtime" component of the wage is examined separately, I find, it responds to economic conditions less than bonuses but more than base wages.

### **Multinational Corporations, Transfer Prices, and Taxes: Evidence from the U.S. Petroleum Industry**

**Jean-Thomas Bernard and Robert J. Weiner**

Working Paper No. 3013

June 1989

JEL Nos. 442, 323, 632

Economic research on transfer pricing by multinational corporations has emphasized theoretical modeling and institutional description. This paper pre-

sents the first systematic empirical analysis of transfer prices, using data from the petroleum industry. On the basis of oil imported into the United States over 1973–84, we test two propositions: 1) Are prices set by integrated companies for their internal transfers different from those prevailing in arm's-length (that is, inter-company) trade, when other variables, such as oil quality, are controlled for? 2) Do average effective corporate income tax rates explain observed patterns of transfer pricing?

We conclude that transfer and arm's-length prices differ significantly for oil originating in some, but not all, countries. When multiplied by the relevant import volumes, these differences are relatively small. The revenue transferred through deviations from arm's-length prices represent 2 percent or less of the value of the crude oil imported by multinational companies each year.

We also find that the observed differences between arm's-length and transfer prices are not explained easily by average effective tax rates in exporting countries. Our results provide little support for the claim that multinational petroleum companies set their transfer prices to evade taxes. We offer several hypotheses to explain our findings.

### **Increasing Returns, Durables, and Economic Fluctuations**

**Kevin M. Murphy, Andrei Shleifer, and Robert W. Vishny**  
Working Paper No. 3014  
June 1989  
JEL No. 131

We describe an economy where a durable good is produced with an increasing returns-to-scale technology. Equilibriums in this economy take the form of business cycles in which consumption fluctuates too much and is too low on average. A two-sector version of this economy with imperfect credit and labor inputs in different sectors move together. The model is consistent with a broad range of evidence on economic fluctuations.

### **Risk Neutrality and the Two-Tier Foreign Exchange Market: Evidence from Belgium**

**Robert P. Flood and Nancy P. Marion**  
Working Paper No. 3015  
June 1989

Most of the literature on two-tier exchange markets is built around models in which domestic policy can

exert a powerful influence on the spread between the current account exchange rate and the capital account exchange rate. We show that if optimizing agents are risk neutral, domestic policy has no significant influence on the spread. Our work with Belgian data suggests that a risk-neutral specification for Belgian residents acting in the two-tier market is hard to reject. We also find evidence that domestic variables do not affect the Belgian spread.

### **Strategic Use of Antidumping Law to Enforce Tacit International Collusion**

**Robert W. Staiger and Frank A. Wolak**  
Working Paper No. 3016  
June 1989  
JEL Nos. 411, 422

We consider the impact of domestic antidumping law in a two-country partial equilibrium model in which domestic and foreign firms tacitly collude in the domestic market. Firms engage in an infinitely repeated game, with each period composed of a two-stage game. In the first stage, each firm chooses capacity before stochastic domestic demand is realized. In the second stage, after demand is realized, each firm sets price.

We show that the introduction of domestic antidumping law typically leads to the filing of antidumping suits by the domestic industry in low-demand states, and to more successful collusion and greater market share for domestic firms during periods of low demand as a result. This occurs in spite of the fact that antidumping duties are never actually imposed. That is, the entire effect of antidumping law comes in the form of a threat to punish foreign firms with a duty *if* they should "misbehave." Such a threat is made credible by filing a suit and, because it is credible, never has to be implemented. We conclude that the trade-restricting effects of antidumping law may have little to do with whether duties are actually imposed.

### **Arbitrage and the Savings Behavior of State Governments**

**Gilbert E. Metcalf**  
Working Paper No. 3017  
June 1989  
JEL Nos. 320, 324

The federal tax code creates strong incentives for tax arbitrage activity on the part of state governments.



This arbitrage activity is illegal and previous research typically has assumed that the constraint against arbitrage activity is binding.

This paper explicitly tests this proposition by considering whether financial asset holdings increase as the yield spread between taxable and tax-exempt securities rises. Using a dataset on 40 state governments over a seven-year period, I find that there is a significant response to changes in the yield spread. One implication of these results is that the Tax Reform Act of 1986, which made even greater efforts to curb arbitrage activity, is likely to be ineffective.

## **Issues and Results from Research on the Elderly**

**Michael D. Hurd**

Working Paper No. 3018

June 1989

### **I: Economic Status**

This paper presents background material on demographic change, living arrangements, income growth, and labor force participation of the elderly. It also describes research on economic status, including: adjustments to observed income to bring it closer to a welfare measure (the objective is to determine whether the elderly are better off than the nonelderly); the distribution of income among the elderly—in particular, the extent and causes of the high poverty level of elderly widows; wealth holdings, especially sources of wealth; and the importance of public programs.

### **II: Retirement**

A substantial portion of the research on retirement has aimed at explaining the large drop in the labor force participation rate of elderly males. The explanations center on Social Security, pensions, and private wealth. Although all three surely have had some effect, the research is not well enough advanced to estimate the contribution of each with confidence.

### **III: Consumption and Saving**

The impetus for much of the research on consumption and saving by the elderly was the finding that wealth seems to increase with age, contradicting a prediction of the life-cycle hypothesis of consumption. This discussion concentrates on how panel data have been used to test predictions of the life-cycle hypothesis and studies the role of saving for bequests. Housing turnover is particularly important because housing equity is such a large fraction of the wealth of the elderly.

## **Strategic Investment in a Debt Bargaining Framework**

**Joshua Aizenman and Eduardo R. Borensztein**

Working Paper No. 3019

June 1989

JEL No. 400

This paper analyzes the strategic role of investment from a debtor country's perspective. In this framework, if the debtor country is unable to meet debt obligations, then a bargaining regime determines the amount of debt repayment. In the context of a two-country real trade model, debt repayment is equal to the trade surplus of the debtor. The outcome of the bargaining game therefore will be dependent (among other things) on the level of production in the debtor country. This paper shows that productive investment may increase or decrease the bargaining power of the debtor country. This ambiguity appears to be fairly robust.

## **Market Work, Wages, and Men's Health**

**Robert H. Haveman, Mark Stone, and Barbara Wolfe**

Working Paper No. 3020

June 1989

In this paper, we investigate the complex interrelationships among worktime, wages, and health that are identified in the Grossman model of the demand for health. We specify a three-equation simultaneous model designed to capture the time-dependent character of these interrelationships, and we estimate the model using eight years of panel data on 882 males aged 22 to 71.

Using our data, we estimate simpler models with more restrictive assumptions commonly found in the literature and find substantial differences between these estimates and those from the simultaneous model. For example, the positive relationship between worktime and health found in other studies disappears when we account for the relevant simultaneities. Our estimates also suggest that worktime spent in environmentally adverse conditions is inversely related to health status, while job-related physical exercise retards health deterioration.

## **Changes in the Structure of Wages: The United States versus Japan**

**Lawrence F. Katz and Ana L. Revenga**

Working Paper No. 3021

July 1989

This paper examines changes in wage differentials by educational attainment and experience in the Unit-

ed States and Japan since the early 1970s. While educational earnings differentials have expanded dramatically in the United States in the 1980s, in Japan the college wage premium has increased only slightly. In contrast to the large expansion in experience differentials for high school males in the United States, in Japan from 1979 to 1987 the wages of male new entrants have risen relative to more experienced workers for both high school and college graduates. Macroeconomic factors (increased openness, trade deficits, and labor market slack) and changes in institutional structures (the decline in unionization) are likely to have amplified each other in contributing to an unprecedented decline in real and relative earnings of young less-skilled males in the United States in the 1980s. Further, we find that a sharp deceleration in the rate of growth of college graduates as a fraction of the labor force in the United States helps to account for the much larger increase in the college wage premium in the United States than in Japan in the 1980s.

### **The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behavior**

**Frank R. Lichtenberg and Donald Siegel**

Working Paper No. 3022

June 1989

JEL Nos. 226, 521, 611, 621, 631, 825

We investigate the economic effects of leveraged buyouts (LBOs) using large longitudinal establishment and firm-level Census Bureau datasets linked to a list of LBOs compiled from public data sources. About 5 percent, or 1100, of the manufacturing plants in the sample were involved in LBOs during 1981-6. We find that plants involved in LBOs had significantly higher rates of total factor productivity (TFP) growth than other plants in the same industry. The productivity impact of LBOs is much larger than our previous estimates of the productivity impact of ownership changes in general. *Management* buyouts appear to have a particularly strong positive effect on TFP.

Labor and capital employed tend to decline (relative to the industry average) after the buyout, but at a slower rate than they did before the buyout. The ratio of non-production to production labor cost declines sharply, and production worker wage rates increase, following LBOs. LBOs are production-labor-using, nonproduction-labor-saving, organizational innovations. Plants involved in management buyouts (but not in other LBOs) are less likely to close subsequently than other plants. The average R and D-intensity of firms involved in LBOs increased at least as much from 1978 to 1986 as did the average R and D-intensity of all firms responding to the NSF/Census survey of industrial R and D.

### **Trade and Protection in Vertically Related Markets**

**Barbara J. Spencer and Ronald W. Jones**

Working Paper No. 3023

June 1989

JEL No. 411

A domestic firm is partially dependent on a foreign vertically integrated supplier for a key intermediate product when both firms are Cournot competitors in the market for the final product. The foreign supplier generally charges its domestic rival a price for the input that exceeds the independent monopoly level, and vertical foreclosure may occur. Domestic policies applied to the vertically related products can increase domestic welfare by reducing the price and increasing the availability of imported supplies of the input. Vertical integration in the foreign supplier has significant implications for all three domestic policies considered: a tariff or subsidy on imports of both products and a domestic production subsidy. The foreign vertically integrated firm tends to reduce its price for the input in response to an import tariff on the final product, whereas a simple monopoly supplier would respond by increasing its export price. Also, domestic cost conditions for the production of the input can critically affect the desirability of a tax as opposed to a subsidy on intermediate imports.

### **Collateral, Rationing, and Government Intervention in Credit Markets**

**William G. Gale**

Working Paper No. 3024

July 1989

This paper analyzes the effects of government intervention in credit markets when lenders use collateral, interest, and the probability of granting a loan as potential screening devices. I examine equilibria with and without rationing. The principal theme is that credit policies operate through their effect on the incentive compatibility constraint, which inhibits high-risk borrowers from mimicking the behavior of low-risk borrowers. Any policy that loosens (tightens) the constraint raises (reduces) efficiency.

Most government credit programs explicitly attempt to fund investors who cannot obtain private financing. In the model presented in this paper, these subsidies increase the extent of rationing and reduce efficiency. In contrast, policies that subsidize the nonrationed borrowers, or all borrowers, enhance efficiency and reduce the extent of rationing.

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