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In This Issue

Program Report: Asset Pricing 1

Research Summaries
Strategic Asset Allocation: Portfolio Choice for Long-Term Investors 8
Capital Flows and Crises in Emerging Markets 12
Computer and the Internet 15
Globalization and Macroeconomics 18

NBER Profiles 24
Conferences 26
Bureau News 37
Bureau Books 48
Current Working Papers 49

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Program Report

Asset Pricing

John H. Cochrane*

As the name suggests, a large part of our effort in this program involves understanding the prices of financial assets — stocks, bonds, options, currencies, and derivatives. Why do prices move? Why do some assets give consistently higher returns than others? What are the underlying macroeconomic risks that balance low prices and attractive returns? Asset pricing researchers also study the economics of financial markets more generally, including the formation and design of securities and security markets, the nature of financial contracting and banking, the trading mechanisms in securities markets, and the regulation of markets and related issues. Asset pricing research is characterized by a lively interplay between theory, empirical work that evaluates theories, and empirical work that focuses on interesting facts.

New Factors, Time-Variation, and Macroeconomics

Average returns are higher and prices are lower for securities that pay off poorly in macroeconomic "bad times." Our central task is to find the correct measure of "bad times." A body of empirical and theoretical work now suggests a quite radical change in traditional views of this measure. First, something like a "recession factor" is important in addition to swings in the market as a whole. In fact, the bulk of cross-sectional variation in stock prices and average returns may be attributable to this additional risk factor rather than to a stock's tendency to move with the market as a whole. Second, mean returns, covariances, and risk premiums all vary through time; the variation is as large as typical values, and also has a suggestive business cycle pattern. Theory, application, and empirical work can be profoundly affected by this fact. For example, almost all variation in the cost of capital is caused by varying risk premiums, not interest rates. Much research on asset pricing

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fleshes out these points, and John Y. Campbell[1] and I[2] review this literature in depth.

Martin Lettau and Sydney Ludvigson[3] find that a conditional capital asset pricing model (CAPM) and a conditional consumption-based model can explain the cross-section of stock returns just as well as the Fama-French model which is based on size and book-to-market portfolios. In "bad times," measured by the consumption-to-wealth ratio, value stocks covary strongly with market return and with consumption growth. This covariance is absent in good times, which is why an unconditional CAPM or a consumption-based model does not work. This striking paper merges both the importance of a conditional approach and the search for additional "recession factors" that drive risk premiums.

Tano Santos and Pietro Veronesi[4] create an asset pricing model that prices a claim to dividends that is distinct from consumption. The dividend/consumption ratio (also interpreted as the ratio of human capital to market value) becomes a state variable that forecasts returns and drives variation in expected returns and covariances.

George M. Constantinides and Darrell Duffie[5] show that an increase in cross-sectional risk to labor income during market downturns can, in priniciple, explain all asset pricing puzzles. Alon Brav, Constantinides, and Christopher C. Geczy[6] take up the empirical challenge: does cross-sectional risk increase enough in market downturns to be the "recession factor"? They find some preliminary support, but document the troublesome noise in individual income and consumption data.

Campbell and I[7] focus on the subject of conditioning information. We

examine a model economy in which a *conditional* consumption-based model holds perfectly, but risk aversion varies over time. This model generates predictable returns. We find that the static CAPM is a better approximate model than the static consumption-based model, and that multifactor models beat the static CAPM in their artificial data. This calculation suggests the importance of including conditioning information in evaluating asset-pricing models.

Wayne E. Ferson and Campbell R. Harvey[8] test conditional asset pricing models. They check Merton's classic idea that bad news also indicates bad times, and thus that returns that are correlated with news variables should carry risk premiums. They find that such information variables are in fact important risk factors. This paper links the new factor question with the time-variation question nicely.

Owen Lamont[9] provides an intriguing new description of the relation between asset prices and macroeconomic events by constructing "economic tracking portfolios." While it is well known that the market as a whole is correlated with GDP and macroeconomic events, Lamont goes further and constructs portfolios that are correlated maximally with specific macroeconomic events and forecasts. He finds that using tracking portfolio returns as instruments for future economic variables substantially raises the estimated sensitivity of asset prices to news about those economic variables. Furthermore, the tracking portfolios can be used to partially hedge economic risks directly, without creating new securities as Steven J. Davis, Jeremy Nalewaik, and Paul Willen advocate.[10]

The high-tech econometric end of empirical asset pricing is similarly engaged with modeling time-varying conditioning information.[11]

Predictable Returns and the Value Effect

The fact, character, and interpretation of return predictability are still hotly debated. It appears that over the long run, stock returns "mean revert" — high prices relative to dividends, book value, and so on signal that subsequent returns will be low. In fact, this pattern may be thought of in reverse: high prospective returns mean that cash flows are discounted at a higher rate, which in turn lowers current prices. Thus, prices reveal changes in expected returns. This pattern holds across individual stocks — the "value effect" — as well as over time for the market as a whole. That is a sobering thought to holders of recently hot dot-com growth stocks (with very high price-to-anything ratios). In principle, this phenomenon can be explained by slow, business-cycle related variation in risks or risk aversion, but asset pricing researchers are actively exploring the nature of that risk or risk aversion.

Randolph Cohen, Polk, and Tuomo Vuolteenaho[12] examine whether firms that have high market prices relative to book value (Tobin's q) have higher expected cash flows, or lower expected returns. In contrast to the market as a whole, in which such variation is almost entirely driven by variation in risk premiums, Cohen, Polk, and Vuolteenaho find that half or more of the cross-sectional variation in market and book ratios is driven by variation in expected cash flows.

Diversified firms have lower value — lower market value and book value — than do apparently comparable single-segment firms or portfolios of single segment firms. This classic effect gets at the larger question of how and why value ratios can forecast returns. Lamont and Polk[13] break the diversification discount into two components: how much of the discount reflects lower subsequent cash flows, and how much represents a higher discount rate, revealed by higher subsequent returns. Interestingly, they find that only half of the diversification discount is attributable to lower profits, leaving half to be explained by higher discount rates and covariation of discount rates with profits. This finding may reflect riskier activities for the diversified firms; perhaps they diversified in order to undertake riskier activities. At any rate, Lamont and Polk show that the classic story of diversified firms simply wasting cash flow opportunities must be substantially revised, and that as elsewhere in finance, risk premiums must play a central role.

In a separate paper, Lamont and Polk[14] directly examine the classic question of whether diversification causes or is caused by lower value. They attack this causality question with a clever identification using the diversity of industry investment, and conclude that diversification does lower value.

Hyun-Han Shin and Rene M. Stulz[15] deconstruct the value effect into systematic and idiosyncratic components. They notice that prices for stocks with more systematic risk — a greater tendency to move up or down with the market as a whole — are *higher* relative to book value than the prices of stocks with more firm-specific risk (which are lower, relative to book value). The first fact runs opposite to the usual value effect that low returns follow high prices. Shin and Stulz argue that this result means that expected cash flows must be higher for riskier firms, and that growth stocks are more sensitive to market movements. Shin and Stulz suggest that this finding stems from the real option nature of equity: options on riskier projects are, with other variables held constant, more

valuable.

Jonathan Berk, Richard C. Green, and Vasant Naik[16] model these interactions between investment, growth options and firm value. Their model reproduces a number of facts, including the time-series and cross-sectional relationship between the book-to-market ratio and asset returns, and the inverse relationship between interest rates and the market risk premium.

Predictable Returns and Momentum

It appears that if you buy a portfolio of stocks that performed best in the last year, and short a portfolio of the worst performers, you will make money over a period of six months and perhaps a year. This is termed "momentum." This short-term effect goes in the opposite direction from the longer-term value or mean-reversion effect, in which past winners lose over the long run. Yet many researchers reconcile the two effects by thinking of a humped-shaped response function for stock values.

Momentum can be generated by the product of slight autocorrelation in returns magnified by their wide dispersion. Since the best tenth of stocks typically went up 80 percent last year, and the worst tenth went down 60 percent, just a mere continuation of this return can generate an expected return of a few percent for the long-short portfolio over the next few months or a year. Momentum thus is concentrated in holding short positions of small losing stocks at the end of the year. This suggests that an explanation is based on frictions, but this has not yet been proven. We could start looking for time-varying risk premiums, but positive short-order autocorrelation, even if small, is much harder to explain as a consequence of slow, business-cycle related variation in risks or risk aversion. Therefore, momentum is much more controversial. In short, momentum remains an anomaly.

Dong-Hyun Ahn, Jacob Boudoukh, Mathew Richardson, and Robert F. Whitelaw[17] show that liquid international equity index futures that can easily be shorted do not show the same momentum pattern as the underlying indexes. In this market, and they suggest in others, momentum in the indexes results from market microstructure effects rather than from irrational investors; it cannot be exploited for trading.

Jonathan Lewellen[18] notes that momentum can occur if a rise in one stock forecasts declines in other stocks, as well as the more traditional interpretation based on positive autocorrelation in individual returns. In fact, he finds that most momentum is driven by negative cross-correlation. This finding spells trouble for the view that momentum is caused by slow information diffusion about the prospects of a single firm.

Narasimhan Jegadeesh and Sheridan Titman[19] survey several explanations for momentum. They report that momentum continues out of its original sample and dismiss the argument that it simply reflects variation in unconditional means across assets in unconditional means (stocks that did better last year are likely to have higher unconditional means, and so do better next year).

Many anomalies, including size and momentum, are concentrated around the end of the year, suggesting that they may result from tax-induced trading. James M. Poterba and Scott J. Weisbenner[20] examine how specific changes in the tax code have affected the incentives for year-end trading. Their findings support the role of tax-loss trading in contributing to turn-of-the-year return patterns.

Harrison Hong, Terence Lim, and Jeremy C. Stein[21] show that momentum strategies work best in small stocks with limited analyst coverage. They also find an interesting asymmetry: the effect of analyst coverage is stronger for losers than for winners.

Crashes

Joseph Chen, Hong, and Stein[22] investigate the determinants of "crashes" which they define as asymmetries in the conditional distributions of stock returns. They find that the negative change in individual stocks and the market as a whole is most pronounced when there is an increase in trading volume over the prior six months and when there are positive returns over the prior 36 months. This interesting paper merges asset pricing researchers' interests in applying modern time-series econometrics to asset pricing data, going beyond traditional linear models of mean and variance, with their interest in "crashes" and information structures behind trading.

David Bates and Roger Craine[23] note that during the October 1987 crash, there were rumors that a major clearinghouse might fail. They assess the probabilities of this event, find it plausible, and suggest that the Federal Reserve's October 20 announcement that it stood ready to supply the necessary liquidity may have acted to eliminate this possibility.

Theory

An evolving strand of theoretical work explains the anomalous behavior of asset markets based on a combination of differences in information, or information processing, together with market frictions. Hong and Stein[24] develop a theory of stock-market crashes based on differences of opinion among investors that is then combined with constraints on short sales. Because they cannot sell short, bearish investors' opinions may not be reflected in market prices. However, if other previously bullish investors have a change of heart and bail out of the market, then the originally more-bearish group may become the marginal "support buyers." In this way,

more will be learned about their signals, and the accumulated bearish information tends to come out during market declines.

While asymmetric information has been the most reliable explanation of financial frictions for 30 years, Fernando Alvarez and Urban J. Jermann[25] have instead started to apply participation constraints (with symmetric information) as an explanatory factor. Insurance can't be perfect, because you cannot tax the lucky so much that they leave the system. Alvarez and Jermann study the quantitative implications of this type of model and find that it can generate a large equity premium and a large risk premium for long-term bonds.

Average returns are hard to measure since returns are so volatile. The standard formula $\sigma/\sqrt{T}$ for the uncertainty about a sample mean implies that even twenty to fifty years of data are not enough to nail down the average return on stocks. Therefore, the true probability distribution of returns may differ substantially from "rationally" expected probabilities, even with substantial historical experience. Lewellen and Jay Shanken[26] expand on this observation to construct a model based on learning that explains many apparent anomalies, including the predictability of returns and average returns far from the predictions of the CAPM. Kent D. Daniel, David Hirshleifer, and Avanidhar Subrahmanyam[27] construct a model that mixes rational and irrational investors to obtain some rational pricing mixed with anomalies.

In an invasion from asset pricing to macroeconomics, I[28]show that nominal government debt really is an equity claim to future primary surpluses. Valuing such debt as we do equity, the price level can be determined with no monetary frictions whatsoever.

Robert J. Shiller,[29] continuing an important research program on the design of better risk sharing mechanisms, considers the optimal design of the insurance and risk sharing aspects of a Social Security system. Sensibly starting with a consideration of what barriers limit private risk sharing, he describes optimal government-sponsored systems.

Portfolios

The explosion of portfolio research continues. Luis M. Viceira[30] studies portfolios for investors with labor income risks. Where much previous research examined how portfolios should adapt to changing mean returns, George Chacko and Viceira[31] study how portfolios should adapt to periods of greater and lesser return volatility. Campbell and Viceira[32] note that the relevant "risk-free rate" for a long-horizon investor is an indexed perpetuity, a bond with quite long maturity. However, in the absence of indexed bonds, investors may prefer the inflation protection of short-term bonds if inflation is more variable than real interest rates. Campbell and Viceira find large welfare benefits from the introduction of long-term indexed bonds.

Louis K. C. Chan, Jason Karceski, and Josef Lakonishok[33] focus on the crucial question of how to measure covariances between stock returns in forming portfolios. This is an important problem; for example, some of the troubles of Long-Term Capital Management were reported to stem from inaccurate measures of covariance and thus a presumption that investments were much more diversified than they turned out to be. The authors' results support a covariance structure based on a few factors and a heuristic approach based on matching the benchmark's attributes.

Recently, datasets have become available that allow us to study the investment decisions of individual investors and institutions. This work dovetails with a renewed interest in heterogeneity in macroeconomics, finance, and the new portfolio theory more generally. Do investors behave as our models say they should?

William N. Goetzmann and Massimo Massa[34] examine individual accounts in an S&P 500 Index mutual fund to examine the trading and investment behavior of more than 91,000 investors. They identify positive feedback traders as well as contrarians whose activities are conditional on preceding day stock market moves. They find that more frequent traders are typically contrarians, while infrequent traders are more typically momentum investors. They also use the behavior of momentum and contrarian investors to build a measure of "market polarization" or dispersion of investors' beliefs.

James M. Poterba and Andrew Samwick[35] analyze portfolio data from the Surveys of Consumer Finances. They find that household portfolio allocations respond strongly to tax incentives. Households with high marginal tax rates hold more tax-advantaged assets including 401(k) plans and IRAs, corporate stock and tax-exempt bonds, and fewer corporate bonds and interest-bearing accounts. This work complements John B. Shoven and Clemens Sialm's[36] extension of portfolio theory to include tax effects.

Kenneth A. Froot, Paul G. J. O'Connell, and Mark S. Seasholes[37] explore the behavior of daily international portfolio flows into and out of 46 countries from 1994 through 1998, exploiting a dataset that includes over three million institutional trades. They present a number of interesting facts, including that flows are strongly influenced by past returns, investors seem to follow trends, and local stock prices are sensitive to foreign inflows. However, the authors reject the idea that this correlation reflects an information disadvantage on the part of international investors.

Connie Becker, Wayne Ferson, David Myers, and Michael Schill[38] examine the market timing attempts of a sample of 400 mutual funds. They find that funds behave like risk-averse investors who care about returns relative to a benchmark. The funds do time the market based on publicly available information, but seem to have no further market timing ability.

Means and Variances

Even so basic a fact as the average return on stocks over bonds is a subject of lively debate. Is the last century of good returns on U.S. stocks a fundamental fact, a constant of nature, or was it a lot of good luck? Philippe Jorion and William N. Goetzmann[39] make a strong case for luck. The United States has been the most successful capitalist system in the world; most other countries have been plagued by political upheaval, war, and financial crises. Yet this outcome was not predictable at the start of the century. Comparing the United States to 39 markets with histories going as far back as the 1920s, they find that the United States has the highest uninterrupted real rate of appreciation of all countries, at 4.3 percent annually from 1921 to 1996. For other countries, the median real appreciation rate was 0.8 percent. Perhaps the large equity premium reflects a large selection bias. I[40] also argue that much of the postwar stock return was luck, not unconditional mean.

Campbell, Lettau, Burton G. Malkiel, and Yexiao Xu[41] document the popular impression that stocks have become more volatile. There has been a noticeable increase in *firm-level* volatility, even while *market* volatility has declined, as G. William Schwert documents.[42] Therefore, correlations among individual stocks have declined, the explanatory power of a regression of individual stocks on the market has declined, and the number of stocks needed to achieve a given level of diversification has increased. This view is consistent with findings that betas — regression co-efficients of stocks on the market and other indexes — are declining. They note that the volatility measures move together countercyclically and help to predict GDP growth.

Peter F. Christoffersen and Francis X. Diebold[43] ask whether the burgeoning literature documenting changes in return volatility over time matters for portfolio problems and risk management. Using a model-free procedure, they find that the ability to forecast volatility decays quickly with the time horizon. Therefore, they conclude that although changes in volatility that can be forecast might be important for risk management at the short horizons that are relevant for trading desks for example, they may not be important for risk management more generally.

Term Structure of Interest Rates

Modeling of the term structure of interest rates is a continuing research activity. David Backus, Silverio Foresi, and Chris Telmer[44] present an easily readable integration of the daunting finance literature on the term structure of interest rates. Backus, Foresi, Abon Mozumdar, and Liuren Wu[45] show how popular linear ("affine") models—in which the expected change in interest rates, volatility, and risk premiums are linear functions of current interest rates—can be adapted to capture the fact that interest rate spreads forecast bond returns. Boudoukh and Richardson[46] construct a multifactor, nonlinear, continuous-time model of interest rate volatility.

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[1] *J. Y. Campbell, "Asset Pricing at the Millennium," NBER Working Paper No. 7589, March 2000 and* Journal of Finance, *August 2000; "Asset Prices, Consumption, and the Business Cycle," NBER Working Paper No. 6485, March 1998 and* The Handbook of Macroeconomics, *Vol. 1, J. B. Taylor and M. Woodford, eds. Amsterdam: North Holland Press, 1999, pp. 1231–1303.*

[2] *J. H. Cochrane, "New Facts in Finance," NBER Working Paper No. 7169, June 1999 and* Economic Perspectives, *Federal Reserve Bank of Chicago, 23 (3), pp. 36–58; "Where Is the Market Going? Uncertain Facts and Novel Theories," NBER Working Paper No. 6207, February 1998 and* Economic Perspectives, *Federal Reserve Bank of Chicago, 21 (6), November/December 1997.*

[3] *M. Lettau and S. Ludvigson, "Resurrecting the (C)CAPM: A Cross-Sectional Test When Risk Premiums Are Time-Varying," Federal Reserve Bank of New York unpublished paper, presented at the fall 1999 meeting of the NBER's Program on Asset Pricing.*

[4] *T. Santos and P. Veronesi, "Labor Income and Stock Returns," University of Chicago unpublished paper, presented at the summer 2000 meeting of the NBER's Program on Asset Pricing.*

[5] *G. M. Constantinides and Darrell Duffie, "Asset Pricing with Heterogeneous Consumers,"* Journal of Political Economy, *104 (2) (April 1996), pp. 219–40.*

[6] *A. Brav, G. M. Constantinides, and C. C. Geczy, "Asset Pricing with Heterogeneous Consumers and Limited Participation: Empirical Evidence," NBER Working Paper No. 7406, October 1999.*

[7] *J. Y. Campbell and J. H. Cochrane, "Explaining the Poor Performance of Consumption-Based Asset Pricing Models," NBER Working Paper No. 7237, July 1999; forthcoming in the* Journal of Finance.

[8] *W. E. Ferson and C. R. Harvey, "Conditioning Variables and the Cross-Section of Stock Returns," NBER Working Paper No. 7009, March 1999 and* Journal of Finance, *54 (1999), pp. 1325–60.*

[9] *O. Lamont, "Economic Tracking Portfolios," NBER Working Paper No. 7055, March 1999.*

[10] *S. J. Davis, J. Nalewaik, and P. Willen, "On the Gains to International Trade in Risky Financial Assets," NBER Working*

Paper No. 7796, July 2000.

11 *Y. H. Cho and R. F. Engle, "Time-Varying Betas and Asymmetric Effect of News: Empirical Analysis of Blue Chip Stocks," NBER Working Paper No. 7330, September 1999; R. F. Engle and S. Manganelli, "CAViaR: Conditional Value at Risk by Quantile Regression," NBER Working Paper No. 7341, September 1999; T. G. Andersen, T. Bollerslev, F. X. Diebold, and P. Labys, "Exchange Rate Returns Standardized by Realized Volatility Are (Nearly) Gaussian," NBER Working Paper No. 7488, January 2000.*

12 *R. Cohen, C. Polk, and T. Vuolteenaho, "The Value Spread," Northwestern University unpublished paper, presented at the summer 2000 meeting of the NBER's Program on Asset Pricing.*

13 *O. Lamont and C. Polk, "The Diversification Discount: Cash Flows versus Returns," NBER Working Paper No. 7396, October 1999.*

14 *O. Lamont and C. Polk, "Does Diversification Destroy Value? Evidence from Industry Shocks," NBER Working Paper No. 7803, July 2000.*

15 *H. H. Shin and R. M. Stulz, "Firm Value, Risk, and Growth Opportunities," NBER Working Paper No. 7808, July 2000.*

16 *J. Berk, R. C. Green, and V. Naik, "Optimal Investment, Growth Options, and Security Returns," NBER Working Paper No. 6627, June 1998; published in the* Journal of Finance, *54 (1999), pp. 1553–1608.*

17 *D. H. Ahn, J. Boudoukh, M. Richardson, and R. F. Whitelaw, "Behavioralize This! International Evidence on Autocorrelation Patterns of Stock Index and Futures Returns," NBER Working Paper No. 7214, July 1999.*

18 *J. Lewellen, "Momentum Profits and the Autocorrelation of Stock Returns," MIT Sloan School of Management unpublished paper, presented at the summer 2000 meeting of NBER's Program on Asset Pricing.*

19 *N. Jegadeesh and S. Titman, "Profitability of Momentum Strategies: An Evaluation of Alternative Explanations," NBER Working Paper No. 7159, June 1999; forthcoming in the* Journal of Finance.

20 *J. M. Poterba and S. J. Weisbenner, "Capital Gains Tax Rules, Tax Loss Trading, and Turn-of-the-Year Returns," NBER Working Paper No. 6616, June 1998; forthcoming in the* Journal of Finance.

21 *H. Hong, T. Lim, and J. C. Stein, "Bad News Travels Slowly: Size, Analyst Coverage and the Profitability of Momentum Strategies," NBER Working Paper No. 6553, May 1998.*

22 *J. Chen, H. Hong, J. C. Stein, "Forecasting Crashes: Trading Volume, Past Returns and Conditional Skewness in Stock Prices," NBER Working Paper No. 7687, May 2000.*

23 *D. Bates and R. Craine, "Valuing the Futures Market Clearinghouse's Default Exposure during the 1987 Crash," NBER Working Paper No. 6505, April 1998 and* Journal of Money, Credit and Banking, *31 (2) (1999), pp. 248–72.*

24 *H. Hong and J. C. Stein, "Differences of Opinion, Rational Arbitrage and Market Crashes," NBER Working Paper No. 7376, October 1999.*

25 *F. Alvarez and U. J. Jermann, "Quantitative Asset Pricing Implications of Endogenous Solvency Constraints," NBER Working Paper No. 6953, February 1999; F. Alvarez and U. J. Jermann, "Asset Pricing When Risk Sharing Is Limited by Default," NBER Working Paper No. 6476, March 1998.*

26 *J. Lewellen and J. Shanken, "Estimation Risk, Market Efficiency, and the Predictability of Returns," NBER Working Paper No. 7699, May 2000.*

27 *K. D. Daniel, D. Hirshleifer, and A. Subrahmanyam, "Covariance Risk, Mispricing, and the Cross Section of Security Returns," NBER Working Paper No. 7615, March 2000.*

28 *J. H. Cochrane, "Money as Stock: Price Level Determination with No Money Demand," NBER Working Paper No. 7498, January 2000.*

29 *R. J. Shiller, "Social Security and Institutions for Intergenerational, Intragenerational, and International Risk Sharing," NBER Working Paper No. 6641, July 1998.*

30 *L. M. Viceira, "Optimal Portfolio Choice for Long-Horizon Investors with Nontradable Labor Income," NBER Working Paper No. 7409, October 1999.*

31 *G. Chacko and L. M. Viceira, "Dynamic Consumption and Portfolio Choice with Stochastic Volatility in Incomplete Markets," NBER Working Paper No. 7377, October 1999.*

32 *J. Y. Campbell and L. M. Viceira, "Who Should Buy Long-Term Bonds?" NBER Working Paper No. 6801, November 1998; forthcoming in the* American Economic Review.

33 *L. K. C. Chan, J. Karceski, and J. Lakonishok, "On Portfolio Optimization: Forecasting Covariances and Choosing the Risk Model," NBER Working Paper No. 7039, March 1999.*

34 *W. N. Goetzmann and M. Massa, "Daily Momentum and Contrarian Behavior of Index Fund Investors," NBER Working Paper No. 7567, February 2000.*

35 *J. M. Poterba and A. Samwick, "Taxation and Household Portfolio Composition: U.S. Evidence from the 1980s and 1990s," NBER Working Paper No. 7392, October 1999.*

36 *J. B. Shoven and C. Sialm, "Asset Location in Tax-Deferred and Conventional Savings Accounts," NBER Working Paper No. 7192, June 1999.*

37 *K. A. Froot, P. G. J. O'Connell, and M. S. Seasholes, "The Portfolio Flows of International Investors, I" NBER Working Paper No. 6687, August 1998.*

38 *C. Becker, W. Ferson, D. Myers, and M. Schill, "Conditional Market Timing with Benchmark Investors," NBER Working Paper No. 6434, February 1998.*

39 *P. Jorion and W. N. Goetzmann, "A Century of Global Stock Markets," NBER Working Paper No. 7565, February 2000.*

40 *Ibid.*

41 *J. Y. Campbell, M. Lettau, B. G. Malkiel, and Y. Xu, "Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk," NBER Working Paper No. 7590, March 2000; forthcoming in the* Journal of Finance.

42 *G. W. Schwert, "Stock Market Volatility: Ten Years after the Crash," NBER Working Paper No. 6381, January 1998.*

43 *P. F. Christoffersen and F. X. Diebold, "How Relevant Is Volatility Forecasting for Financial Risk Management?" NBER Working Paper No. 6844, December 1998 and* Review of Economics and Statistics, *82 (2000), pp. 12–23.*

44 *D. Backus, S. Foresi, and C. Telmer, "Discrete-Time Models of Bond Pricing," NBER Working Paper No. 6736, September 1998; forthcoming in the* Journal of Financial Economics.

45 *D. Backus, S. Foresi, A. Mozumdar, and L. Wu, "Predictable Changes in Yields and Forward Rates," NBER Working Paper No. 6379, January 1998.*

46 *J. Boudoukh and M. Richardson, "A Multifactor, Nonlinear, Continuous-Time Model of Interest Rate Volatility," NBER Working Paper No. 7213, July 1999.*

Research Summaries

Strategic Asset Allocation: Portfolio Choice for Long-Term Investors

John Y. Campbell*

Academic finance has had a remarkable impact on many financial services. Yet, financial planners offering portfolio advice to long-term investors have received curiously little guidance from academic financial economists.

Mean-variance analysis, developed almost 50 years ago by Harry Markowitz,[1] has provided a basic paradigm for portfolio choice. This approach usefully emphasizes the ability of diversification to reduce risk, but it ignores several critically important factors. Most notably, the analysis is static; it assumes that investors care only about risks to wealth one period ahead. However, many investors — both individuals and institutions, including charitable foundations or universities — seek to finance a stream of consumption over a long lifetime. In addition, mean-variance analysis treats financial wealth in isolation from income. Long-term investors typically receive a stream of income and use it, along with financial wealth, to support their consumption.

Robert Merton showed 30 years ago that the solution to a long-term portfolio choice problem can be very different from the solution to a short-term problem.[2] In particular, if investment opportunities vary over time, then long-term investors care about shocks to investment opportunities — the productivity of wealth — as well as shocks to wealth itself. They may seek to hedge their exposures to wealth productivity shocks, and this gives rise to intertemporal hedging demands for financial assets. Michael Brennan, Eduardo Schwartz, and Ronald Lagnado[3] have coined the phrase "strategic asset allocation" to describe this far-sighted response to time-varying investment opportunities.

Unfortunately, Merton's intertemporal model is hard to solve. Until recently, solutions to the model were available only in those trivial cases in which it reduces to the static model. Therefore, the Merton model has not become a usable empirical paradigm, has not displaced the Markowitz model, and has had minimal influence on financial planners and their clients. This situation has begun to change recently as a result of advances in both analytical and numerical methods. A new empirical paradigm is emerging. Interestingly, this paradigm both supports and qualifies traditional rules of thumb used by financial planners. It also sheds new light on important issues of public policy such as the design of the Social Security system.

Who Should Buy Long-Term Bonds?

An important difficulty with mean-variance analysis becomes clear when one considers the classic problem of allocating a portfolio among three broad asset classes: stocks, bonds, and money market funds ("cash"). One of the most famous results in mean-variance analysis is James Tobin's mutual fund theorem of portfolio choice, according to which all investors should combine cash with a single portfolio or "mutual fund" of risky assets.[4]

The mutual fund theorem directs all investors, conservative or aggressive, to hold the *same* portfolio of stocks and bonds, mixing the portfolio with more or less cash depending on the investor's aversion to risk. Thus, if an aggressive investor holds 80 percent stocks and 20 percent bonds, a conservative investor should maintain the same 4:1 ratio of stocks to bonds at a lower scale, perhaps 40 percent equities and 10 percent bonds, with 50 percent of the portfolio in cash. This is quite different from the way conservative investors actually behave and are advised to behave by financial planners. In practice, conservative investors favor bonds relative to equities so that a conservative portfolio might consist of 40 percent equities, 40 percent bonds, and 20 percent cash. Investors and financial planners do not seem to take mean-variance analysis seriously.

Furthermore, it is hard to explain — using mean-variance analysis — why any investors hold large positions in bonds. Mean-variance analysis treats cash as the riskless asset, and treats bonds merely as another risky asset like stocks. Bonds are valued only for their potential contribution to the short-run excess return, relative to risk, of a diversified risky portfolio. This view tends to relegate bonds to a minor supporting role in the recommended portfolio, since

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excess bond returns historically have been fairly low and bond returns have been highly variable in the short run. From 1970–96, for example, the average excess return on long-term U.S. Treasury bonds over three-month Treasury bills was less than 2 percent, while the standard deviation of this return was almost 11 percent. The ratio of average excess return to standard deviation (the short-term reward-risk ratio or "Sharpe ratio") for bonds was only 0.18. Over the same period, the U.S. equity market had an average excess return of almost 6 percent and a standard deviation of 17 percent, implying a Sharpe ratio that was almost twice as high at 0.34. The comparison looks even less favorable for bonds if one studies the early postwar period of slowly rising inflation or the very recent period of spectacular stock returns.

A long-horizon analysis treats bonds very differently and assigns them a much more important role in the optimal portfolio. For long-term investors, money market investments are *not* riskless because they must be rolled over at uncertain future interest rates. Just as borrowers have come to appreciate that short-term debt carries a risk of having to refinance at high rates during a financial crisis, so long-term investors must appreciate that short-term investments carry the risk of having to reinvest at low real rates in the future. For long-term investors, an inflation-indexed long-term bond is actually less risky than cash. Such a bond does not have a stable market value in the short term, but it delivers a predictable stream of real income and thus supports a stable standard of living in the long term.

Luis M. Viceira and I[5] recently completed an empirical analysis of optimal portfolio choice for long-term investors. Using a statistical model of nominal interest rates, real interest rates, inflation, and stock prices, we calculated optimal portfolios for long-lived investors with varying attitudes toward risk. We concluded that aggressive investors should hold portfolios with almost 100 percent equity, but that more conservative investors should shift largely into bonds, putting a modest allocation into cash. (A larger cash position can be justified as a contingency reserve to meet unexpected consumption needs, but we do not attempt to model this sort of cash demand.)

The conventional wisdom of financial planners holds up well under this analysis: buyers of long-term bonds should be conservative long-term investors, or such institutions as pension funds acting on their behalf. There is one important qualification, however. Our analysis looks at data from 1983–96, during which time monetary policy successfully contained inflation. If we consider historical data from the entire postwar period of 1952–96, then we estimate a much larger risk of inflation, which could erode the real value of long-term nominal bonds. When there is a significant risk of inflation, nominal bonds are far less appealing because they are not good substitutes for inflation-indexed bonds and are not in any sense riskless for long-term investors. Conservative long-term investors who are concerned about the possible return of inflation should hold U.S. Treasury inflation-indexed bonds instead.

Is the Stock Market Safer for Long-Term Investors?

Traditionally, equities have been regarded as risky assets. They may be attractive because of their high average returns, but these returns represent compensation for risk; thus equities should be treated with caution by all but the most aggressive investors. However, in recent years it has become commonplace to argue that equities are actually relatively safe assets for certain investors to hold for the long term. An extreme version of this revisionist view is promoted by James Glassman and Kevin Hassett,[6] who argue that stocks are actually just as safe as bonds or Treasury bills, and that investors will bid stock prices up to unprecedented levels as they come to realize this.

The revisionist view that stocks are safe assets is not based on any reduction in their short-term volatility. The volatility of market index returns has moved up and down — most recently up, after an unusually quiet period in the mid-1990s — but it shows no downward trend. Rather, the revisionist view is based on evidence that stock returns are less volatile, relative to bond or bill returns, when they are measured over long holding periods.

This sort of evidence has been presented by Jeremy Siegel,[7] who uses it to promote an aggressive strategy of buying and holding equities. Looking at U.S. data over a period of almost 200 years (1802–1997), Siegel compares the range of variation of real returns on stocks, long-term bonds, and Treasury bills. In their best single year, stocks delivered a real return of 67 percent, while in their worst single year they returned negative 39 percent, for a range of 106 percent. The one-year range for bonds is far smaller at 57 percent, and the one-year range for Treasury bills is still smaller at 40 percent. A similar pattern emerges if one compares standard deviations of annual real returns as measures of risk. In the 1802–1997 data, the standard deviation of the annual return is 18 percent for stocks, 9 percent for bonds, and 6 percent for bills. For an investor with a one-year holding period, stocks appear to be considerably riskier than fixed-income investments.

The picture is very different for long holding periods of a decade or more. The average annualized real stock return over the best decade between 1802 and 1997 was 17 percent, while the average return over the worst decade was negative 4 percent, for a range of 21 percent. The ranges for bonds and bills over a decade are 18 percent and 17 percent, respectively. Over 20-year periods, the ranges for all three assets are almost identical at 12 percent, and over 30-year periods the range is actually smaller for stocks at 8 percent than it is for bonds and bills at 9 percent. Standard deviations of real returns follow the same pattern when measured over long holding periods; over 20-year periods they are roughly equal, and over 30-year periods they are lower for stocks than for bonds or bills. It would appear that stocks are no riskier than bonds and bills for long-term investors who can hold their positions for at least a decade. Similar patterns are visible in some international markets, although reliable long-term data are harder to come by overseas.[8]

These findings create a puzzle. How can short-term stock market risk largely disappear at long horizons? Where does the risk go? The revisionists devote little attention to this question, but it turns out that the answer is important and it undermines the revisionist case for aggressive investment in equities.

Mathematically, there can be a difference between the short-term risk and the long-term risk of an asset only if its expected return varies over time. With constant expected returns, the annualized standard deviation over a long holding period (N years) is the standard deviation over one year divided by the square root of N. Thus, with constant expected returns, the annualized standard deviations of all assets would shrink along with the square root of the holding period, but they would shrink together; we would not see the standard deviation of stock returns shrinking more rapidly than the standard deviations of bond and bill returns. Evidence for reduced relative risk of stocks at long horizons is therefore indirect evidence for predictable variation in stock returns.

The type of return variation that reduces long-term risk is known as mean-reversion. If unusually good stock returns today lower the expectation of returns in the future, then bull markets tend to be followed by corrections and bear markets tend to be followed by recoveries; stock prices revert toward a long-run average or mean, and stocks are said to be mean-reverting. Under these circumstances, stock market risk declines more rapidly with the investment horizon than the square-root rule would imply.

Siegel's risk measurements provide indirect evidence for mean-reversion, but more direct evidence is also available. One approach is to look at a smoothed P/E ratio for the S&P 500 Index. The smoothed P/E ratio divides current price by an average of earnings over the past decade, in order to eliminate the effects of temporary earnings declines that occur in recessions. There is a very strong negative relationship between smoothed P/E and subsequent long-term growth in real stock prices; years with high initial P/E ratios — such as 1929 or 1966 — tend to have poor average returns over the next decade, while years with low initial P/E ratios, such as 1918 or 1982, tend to have high average returns over the next decade.[9]

In joint work with Viceira, I have calculated the stock holdings that are optimal for investors with constant risk aversion when stocks are mean-reverting. It turns out that for conservative long-term investors, the optimal policy involves a higher allocation to stocks on average, as recommended by Siegel, but the allocation depends on past returns. At a time like the present, when past returns have been high and mean-reversion implies low future returns, the allocation may be no higher — it may even be lower — than would be implied by a traditional short-term analysis assuming a constant equity premium.[10]

Many investors today are attracted to the stock market by the prospect of high returns combined with low long-term risk. These investors are trying to have their cake and eat it too. If expected stock returns are constant over time, then one can hope to earn high stock returns in the future similar to the high returns of the past. But in such a case, stocks are much riskier than bonds in the long term, just as they are in the short term. If stocks mean-revert instead, then they are relatively safe assets for long-term investors; but in that case, future returns are likely to be meager, because mean-reversion unwinds the spectacular stock market run-up of the past decade.

Investing for Retirement

Even if the stock market does not mean-revert, it may be appropriate for young investors to hold riskier portfolios than older investors because the young typically rely more on income and less on financial wealth to support their consumption. Consider an investor who knows her income in advance with perfect certainty and can borrow and lend freely at the riskless interest rate. For this investor, the present value of labor income, discounted at the riskless rate, is equivalent to a position in a riskless asset. Her financial portfolio thus should be tilted toward risky assets to offset this position.[11] Risk in labor income will reduce the magnitude of this tilt toward risky assets, but not reverse it if there is no correlation between labor income risk and investment risk.[12] Only

investors who have volatile labor income that is highly correlated with stock returns, such as investment bankers and executives who are compensated largely through executive stock options, should tilt their portfolios toward safe assets.

A typical investor starts her working life with a small income and very little financial wealth. In early adulthood, income tends to grow fairly rapidly, but people accumulate little wealth since they anticipate higher income in the future and use their current income to support current consumption. In early middle age, asset holdings begin to increase rapidly as investors save for retirement, while current labor income flattens out, and the approach of retirement reduces the discounted value of future labor income. Thus, the discounted value of future income, relative to financial wealth, follows a hump shape over the life cycle. It rises at the very start of a person's career, then peaks fairly early, and declines as retirement approaches. This pattern implies that fairly young investors should have the strongest desire to take stock market risk.

Joao F. Cocco, Francisco J. Gomes, Pascal J. Maenhout, and I[13] have explored the magnitude of these effects in a life-cycle model calibrated to U.S. data on individual income and aggregate asset returns. We model income as having a deterministic component with a hump shape over working life, and a random component with both permanent and temporary shocks. Permanent shocks to income can be correlated with stock returns. We use household data from the Panel Study of Income Dynamics to estimate the income process for households with different levels of education (college, high school, or no high school diploma) and different employment status (regular employment or self-employment, sector of employment). We find that households with higher education levels experience smaller temporary income shocks but larger permanent shocks: career risk as opposed to layoff risk. Most household income shocks are correlated only weakly with stock returns, even if we allow for a lag in the effect of the stock market on income. Thus, we estimate that young households should hold more stocks than older households.

In practice, households choose their portfolios subject to various types of constraints. It is extremely difficult for most households to borrow against their future labor income, and it is also difficult for most households to borrow to finance a leveraged position in the stock market. George M. Constantinides, John B. Donaldson, and Rajnish Mehra[14] recently have argued that this fact helps to explain the large historical returns to stocks: young adults are the natural holders of stocks, but they are constrained from taking as much equity risk as they would like. This forces middle-aged investors to take up the slack, which they do only at depressed stock prices that imply high average stock returns.

If financial constraints indeed restrict the investment policies of many households, then government policy may be able to help or hurt households by affecting the severity of the constraints. Cocco, Gomes, Maenhout, and I use our model to evaluate proposals to reform Social Security by investing Social Security funds in the stock market. Such proposals increase the equity exposure of constrained young households and may also allow for a reduction in payroll tax rates, thus increasing the consumption of constrained young households. If we assume that households save optimally given the constraints they face, then reform will benefit households through both channels. If we assume instead that households do not save adequately on their own, then increased equity exposure will still be beneficial, but it would be a mistake to reduce payroll taxes.

Challenges for Future Research

I have described several factors that may lead long-term investors to choose different portfolio strategies from short-term investors, including changing real interest rates, mean-reversion in stock returns, and labor income.[15] Other factors also can be important, notably taxation and uncertainty about the processes driving interest rates, stock returns, and income. These factors have not yet been integrated in a single empirically usable model, but the construction of such a model is now a realistic ambition. This offers the exciting prospect that financial economists will be able at last to offer relevant and scientifically grounded investment advice.

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[1] *H. Markowitz, "Portfolio Selection,"* Journal of Finance, *7 (1952), pp. 77–91.*

[2] *R. Merton, "Lifetime Portfolio Selection under Uncertainty: The Continuous Time Case,"* Review of Economics and Statistics, *51 (1969), pp. 247–57; "Optimum Consumption and Portfolio Rules in a Continuous-Time Model,"* Journal of Economic Theory, *3 (1971), pp. 373–413; "An Intertemporal Capital Asset Pricing Model,"* Econometrica, *41 (1973), pp. 86–87.*

[3] *M. Brennan, E. Schwartz, and R. Lagnado, "Strategic Asset Allocation,"* Journal of Economic Dynamics and Control, *21 (1997), pp. 1377–1403.*

[4] *J. Tobin, "Liquidity Preference as Behavior Towards Risk,"* Review of Economic Studies, *25 (1958), pp. 68–85.*

[5] *J. Y. Campbell and L. M. Viceira, "Who Should Buy Long-Term Bonds?," NBER Working Paper No. 6801, November 1998; forthcoming in* American Economic Review.

[6] *J. Glassman and K. Hassett,* Dow 36,000, *New York: Times Books, 1999.*

[7] *J. Siegel,* Stocks for the Long Run, *2nd ed., New York: McGraw-Hill, 1998.*

[8] *Comparative international evidence on stock and bond market performance is reported in J. Y. Campbell, "Asset Prices, Consumption, and the Business Cycle," Ch. 19 in* Handbook of Macroeconomics *Vol. 1, J. Taylor and M. Woodford, eds., Amsterdam: North-Holland, 1999.*

[9] *J. Y. Campbell and R. Shiller, "Valuation Ratios and the Long-Run Stock Market Outlook,"* Journal of Portfolio Management *(Winter 1998), pp. 11–26. Earlier work on mean-reversion includes E. Fama and K. French, "Permanent and Temporary Components of Stock Prices,"* Journal of Political Economy, *96 (1988), pp. 246–73 and "Dividend Yields and Expected Stock Returns,"* Journal of Financial Economics, *22 (1988), pp. 3–27; J. Campbell and R. Shiller, "Stock Prices, Earnings, and Expected Dividends,"* Journal of Finance, *43 (1988), pp. 661–76; J. Poterba and L. Summers, "Mean-Reversion in Stock Returns: Evidence and Implications,"* Journal of Financial Economics, *22 (1988), pp. 27–60.*

[10] *J. Y. Campbell and L. M. Viceira, "Consumption and Portfolio Decisions When Expected Returns Are Time Varying,"* Quarterly Journal of Economics, *(May 1999), pp. 433–95. This paper assumes that interest rates are constant. Similar results are reported in J. Y. Campbell, Y. L. Chan, and L. M. Viceira, "A Multivariate Model of Strategic Asset Allocation," a forthcoming NBER Working Paper, for a model with time-varying interest rates. An obvious concern about the portfolio rules developed in these papers is that they require all investors to buy or sell stocks simultaneously, which is not possible in general equilibrium. One possible resolution of this problem is that most investors have attitudes toward risk that are not stable but shift over time, as proposed by J. Y. Campbell and J. H. Cochrane, "Habit Formation: A Consumption-Based Explanation of Aggregate Stock Market Behavior,"* Journal of Political Economy, *107 (1999), pp. 205–51.*

[11] *Z. Bodie, R. Merton, and W. Samuelson, "Labor Supply Flexibility and Portfolio Choice in a Life-Cycle Model,"* Journal of Economic Dynamics and Control, *16 (1991), pp. 427–49. These authors emphasize that the tilt toward risky financial investments is strengthened if investors are able to adjust their labor supply, work harder, or delay retirement in response to poor returns on risky assets.*

[12] *L. M. Viceira, "Optimal Portfolio Choice for Long-Horizon Investors with Nontradable Labor Income," NBER Working Paper No. 7409, October 1999; forthcoming in the* Journal of Finance.

[13] *J. Y. Campbell, J. F. Cocco, F. J. Gomes, and P. J. Maenhout, "Investing Retirement Wealth: A Life-Cycle Model," NBER Working Paper No. 7029, March 1999; forthcoming in* Risk Aspects of Investment-Based Social Security Reform, *J. Y. Campbell and M. Feldstein, eds., from University of Chicago Press. This paper relies heavily on the specification developed in J. F. Cocco, F. J. Gomes, and P. J. Maenhout, "Consumption and Portfolio Choice over the Life Cycle," unpublished paper, Harvard University, 1998.*

[14] *G. M. Constantinides, J. B. Donaldson, and R. Mehra, "Junior Can't Borrow: A New Perspective on the Equity Premium Puzzle," NBER Working Paper No. 6617, June 1998.*

[15] *Luis M. Viceira and I are currently writing a book that reviews these factors in greater detail,* Strategic Asset Allocation: Portfolio Choice for Long-Term Investors, *forthcoming from Oxford University Press.*

Capital Flows and Crises in Emerging Markets

Michael P. Dooley*

Private capital flows to developing countries have been characterized by surges of inflows followed by financial crises. Explanations for this volatility can be found in the behavior and expectations of investors. However, the challenge is to look for less obvious explanations. In particular, is there a framework that can inform us about the apparently very different events, such as the 1982 debt crisis in Latin America and the 1998 crisis in Russia, without appealing to destabilizing investor behavior? Only ten years ago most "academics" were convinced that crises could be explained by conflicts between exchange rate policies and fiscal policies of emerging market governments. This view has been demolished by the apparent absence of such conflicts preceding recent crises in Asia.

My research strategy has been to propose alternative policy conflicts while retaining the assumption that private financial markets are inherently stable. The foundation of this approach is the well-known moral hazard problem. The idea is that the behavior of private debtors and creditors is influenced by the expectation that, in some circumstances, creditors will be able to sell their claims to a government on terms that are favorable relative to market prices at the time of the sale.

The capital inflow/crisis sequence based on moral hazard can be summarized as follows:[1] the availability of free insurance raises the expected yield on a set of liabilities issued by residents for a predictable time period. The yield differential relative to international returns generates a private gross capital inflow (a sale of domestic liabilities to nonresidents)

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that continues until the day of attack. When the government's marketable assets are matched by its contingent insurance liabilities, the expected yield on domestic liabilities falls below international rates, and investors sell the insured assets to the government, exhausting its assets.

The idea that moral hazard plays some role in recent financial crises is now widely accepted. However, the possibility that it has been the primary cause of crises remains controversial. My interpretation of the evidence is that the moral hazard approach provides a good basis for understanding and, to some extent, for predicting all of the financial crises that have overtaken developing countries during the past 30 years.

Collateral and Capital Inflows

Why do nonresidents lend to sovereign governments when the ability to collect is so much in doubt? I have suggested that creditor and debtor governments' willingness and ability to liquidate (not just to service) private debt is necessary for private capital inflows. Three "fundamentals" must be present in order to generate a capital inflow/crisis sequence. First, a government must have marketable assets and lines of credit available to support new debt. Collateral consists of assets it can sell (usually international reserve assets) or the right to borrow against future tax receipts at nonmarket rates. This will usually take the form of credit lines from creditor governments and international organizations. One important assumption is that, at the time of a crisis, the debtor government cannot borrow against future tax receipts from a subset of private creditors in order to liquidate the claims of other private creditors. I argue later in this article that private debt contracts are designed to make this "resolution" of a crisis impossible. Second, the government's commitment to exhaust these net reserves to pay off implicit or explicit insurance contracts must be credible. That is, it must be consistent with the government's incentives and ability to mobilize and exhaust its assets *after* the attack begins. Third, investors must have access to transactions that produce insured losses. That is, they must be able to appropriate the government's assets. For example, governments might instruct banks owned or controlled by the government to lend to firms that do not earn the competitive rate of interest in order to promote exports or employment or to subsidize constituents. More directly, the managers of a bank might book a new loan at more than its market value and invest the difference offshore.[2] A properly functioning regulatory framework is designed to make appropriation unprofitable.

Historical Examples of Capital Inflows

The capital inflow to developing countries that ended in the 1982 debt crisis was the first modern example of an insurance-based inflow/crisis sequence.[3] Following the first oil shock, governments of industrial countries decided that private financial intermediaries would be more efficient than governments at recycling investments from oil producers to developing countries. The private intermediaries of choice were large commercial banks chartered in industrial countries. My interpretation of this episode is that bankers understood the risks they were taking but also knew they were too big to fail and expected their own governments to insure their claims on developing countries.

The inflows ended when the stock of implicit claims on insurance exceeded the expected stock of collateral. In 1982 a dramatic rise in U.S. interest rates generated an immediate increase in the contractual value of floating rate debt of developing countries. The willingness and ability of creditor governments to fill the gap between the contractual value of debt and expected payments by debtors was called into question. The role of insurance in this episode has been obscured by the fact that creditor governments defaulted on their implicit liabilities. Conservative governments in the United States, Germany, and the United Kingdom were not inclined to liquidate their banks' claims on governments of developing countries. My interpretation of this outcome is that the 1982 reversal of capital inflows was both a crisis and default. In the next section I attempt to set out why the default was so costly and difficult to resolve.

After 1990, collateral again supported capital inflows to developing countries. For middle-income-developing countries with substantial stocks of external debt the missing fundamental from 1982 through 1989 was a stock of marketable assets to support a credible insurance commitment. After 1989, falling interest rates generated capital gains for debtor countries by reducing the value of floating rate debt. At the same time, stabilization programs supported by the International Monetary Fund, privatization, fiscal reform, and trade liberalization allowed Latin governments to accumulate assets and access to official lines of credit. My coauthors and I warned that these changes in the abilities of debtor governments to insure new capital inflows could again support rapid capital inflows and a new round of crises.[4]

For emerging markets in Asia, the binding constraint on capital inflows was not the value of collateral. Instead, these countries had very effectively limited capital inflows by closing their markets to nonresident

investors. Liberalization made domestic liabilities available to foreign investors. It also made appropriation profitable because the existing regulatory framework was not adapted to deal with international capital flows.[5] In an interesting historical parallel to the 1970s, credible insurers, in this case emerging market governments in Asia, decided to liberalize capital markets in order to increase the efficiency of credit allocation.

The Crisis Phase

Crises come when liabilities equal assets. Yet, as discussed above, the magnitude of both these aggregates is uncertain, and expectations are subject to change. The trigger for crisis can be anything that suddenly pushes the expected value of liabilities over the expected value of assets. Thus, the timing of crises is uncertain ex ante but explainable ex post.

For the insurance story to be plausible, there does have to be enough collateral to make expectations of an exchange plausible. For the six countries that have had crises in recent years, rescue packages and reserves covered about two-thirds of the entire gross private capital inflow after 1989.[6] On average, therefore, investors had to expect to recover only 36 percent of the value of their investments to break even. Depending on the measure of liabilities at risk, insurance was either a very important or a decisive factor ex post in allowing private investors to liquidate their claims on emerging markets. It seems quite reasonable to assume that expected insurance was an important factor in generating the capital inflows in the first place.

Private investors will not expect to participate in the asset exchange unless they are a threat to governments at the time of crisis. Hence, investors have to predict how governments' preferences and constraints shape their treatment of various private creditors. One of the interesting implications of this approach is that investors' place in line for the government assets is endogenous.[7] The same credit or creditor will be treated differently depending on the structure of the country's debt and the relative power of other creditors to impose costs on governments. The clear implication is that the structure of debt associated with previous crises will not be informative about the timing or likelihood of future crises. Finally, there are some creditors who are never bailed out — equity holders are a good example — but this does not reduce the usefulness of the model. The insurance theory would suggest that these types of claims pay very high returns in order to compensate for their expected junior status in the event of a crisis. In fact, the rates of return on equities in emerging markets prior to crises seem to be consistent with this expectation. A common negative shock to governments' net assets could truncate this process and generate a number of crises at the same time. Thus, a change in a common insurance fundamental might account for a bunching of crises. The crisis in Russia, for example, may have spread to Brazil because both countries had large stocks of domestic currency debt held by nonresidents. Russia's example that such positions were at risk led to a sensible move to reduce similar exposure in Brazil.

Default and Stagnation

Why has default been so painful? In a recent paper[8] I argue that the link between financial crises and losses in real output is provided by international debt contracts that are structured to make strategic default unattractive to the sovereign debtor. The mechanism that accomplishes this is the design of contracts that are costly to renegotiate. The inability to renegotiate debt, in turn, guarantees a time interval during which residents of the country in default find it difficult to borrow from one another or from nonresidents.[9] Since renegotiation cannot be conditioned by the reason for default, contracts designed to discourage strategic default will impose unnecessary output losses following unavoidable defaults.

International debt contracts are costly to renegotiate because all of the country's creditors must agree. The important coordination problem is not among banks or bondholders but between private creditors, official creditors, and holders of domestic debt.[10] After a sovereign default there is a high probability that the debt will be restructured again. At the time of a future restructuring, the share of the new debt claimed will be determined by the principal value of the existing claims. If one class of creditors accepts a reduction in the contractual value of its claims, then its share of the new debt issued relative to other creditor groups will be reduced. In the limiting case, it is perfectly rational for creditors to demand average prices from other creditors or the debtor in reducing marginal debt.[11] Since every creditor must be at the table and write down debt simultaneously, such negotiations will be very difficult and costly.

Conclusions

Private international capital flows to and from developing countries are an important and poorly understood component of the international monetary system. Clearly, emerging market countries' best, and perhaps only, hope for developing efficient financial systems is to join the very competitive and efficient capital markets available to residents of industrial countries. But my reading of their recent attempts to do so suggests that market participants are also very

good at exploiting opportunities for appropriating governments' assets. The cost of transferring wealth from taxpayers to investors has been considerable, but it pales in comparison to the costs in terms of economic stagnation when investors miscalculate the willingness or ability of governments to deliver on their implicit guarantees.

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1 *See M. P. Dooley, "Financial Sector Reforms, Economic Growth, and Stability: Experiences in Selected Asian and Latin American Countries," in* Economic Development Institute Seminar Series, *S. Faruqi, ed. Washington, D.C.: World Bank, 1994; M. P. Dooley, "Are Capital Inflows to Developing Countries a Vote for or against Economic Policy Reforms?," in* The Asian Financial Crisis: Causes, Contagion and Consequences, *P. R. Agenor, M. Miller, D. Vines, and A. Weber, eds. New York: Cambridge University Press, 2000; M. P. Dooley, "A Model of Crises in Emerging Markets," NBER Working Paper No. 6300, December 1997, and* The Economic Journal *(January 2000), pp. 256–72.*

2 *For a discussion of the role of capital flight prior to recent crises in Asia, see M. P. Dooley "Indonesia: Is the Light at the End of the Tunnel Oncoming Traffic?," in* Global Emerging Markets, *Deutsche Bank, June 1998.*

3 *See M. P. Dooley, "A Retrospective on the Debt Crisis," NBER Working Paper No. 4963, July 1995, and in* Exchange Rate Policy and Interdependence, *P. Kenan, ed. Princeton, NJ: Princeton University Press, 1995.*

4 *For an empirical analysis of market prices of sovereign debt and a warning that new capital inflows might again end in crisis, see M. P. Dooley, E. Fernandez-Arias, and K. M. Kletzer, "Is the Debt Crisis History? Recent Capital Inflows to Developing Countries," NBER Working Paper No. 4792, July 1994, and* World Bank Economic Review, *10 (1) (January 1996), pp. 27–50.*

5 *See M. P. Dooley, M. D. Chinn, and S. Shrestha, "Latin America and East Asia in the Context of an Insurance Model of Currency Crises," NBER Working Paper No. 7091, April 1999, and* Journal of International Money and Finance, *18 (1999), pp. 659–81. For a case study on the failure of regulation in Korea, see M. P. Dooley and I. Shin, "Private Inflows When Crises Are Anticipated," in* Financial Crises in Emerging Markets, *R. Glick R. Moreno, and M. M. Spiegel, eds., forthcoming from Cambridge University Press.*

6 *For data on assets and liabilities, see M. P. Dooley, "A Model of Crises in Emerging Markets," NBER Working Paper No. 6300, December 1997, and* The Economic Journal *(January 2000), p. 261.*

7 *See M. P. Dooley and M. R. Stone, "Endogenous Creditor Seniority and External Debt Values,"* IMF Staff Papers, *40 (2) (June 1993), pp. 395–413.*

8 *M. P. Dooley " Can Output Losses Following International Financial Crises Be Avoided?," NBER Working Paper No. 7531, February 2000.*

9 *See M. P. Dooley, "Market Valuation of External Debt," Finance and Development, 24 (March 1987), pp. 6–9.*

10 *See M. P. Dooley, R. Haas, and S. Symansky, "A Note on Burden Sharing among Creditors,"* IMF Staff Papers, *40 (March 1993), pp. 226–32.*

11 *For an overview of the problems associated with restructuring debt, see M. P. Dooley and M. Corden, "Issues in the Debt Strategy," in* Analytical Issues in Debt, *J. A. Frenkel, M. P. Dooley, and P. Wickham eds. International Monetary Fund, 1989. See also M. P. Dooley and E. Helpman, "Tax Credits for Debt Reduction: A Proposal,"* Journal of International Economics, *32, (1) (February 1992), pp. 165–77; M. P. Dooley and L. E. O. Svensson, "Policy Inconsistency and External Debt Service,"* Journal of International Money and Finance, *13 (August 1994), pp. 364–74.*

Computers and the Internet

Shane M. Greenstein*

The "commercialization of the Internet" is shorthand for three nearly simultaneous events: the removal of restrictions by the National Science Foundation (NSF) over use of the Internet for commercial purposes; the browser wars initiated by the founding of Netscape; and the rapid entry of tens of thousands of firms into commercial ventures using technologies that employ the suite of TCP/IP (Transmission Control Protocol/ Internet Protocol) standards. These events were the culmination of years of work at NSF to transfer the Internet into commercial hands from its exclusive use for research activity in government-funded laboratories and universities.

Now, sufficient time has passed to begin to evaluate how the market performed after commercialization. In fact, actual events have surpassed the forecasts of the most optimistic managers at NSF. Was this because of mere good fortune or something systematic with lessons for the market today? Other government-managed technologies typically face vexing technical and commercial challenges that prevent them from diffusing quickly, if at all. Can we draw lessons from this episode for the commercialization of other government-managed technologies, or even for the commercialization of other Internet activities?

As a window on these questions, I have examined the Internet access market and one set of actors:

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Internet Service Providers (ISPs). ISPs provide Internet access for most of the households and business users in the country, usually for a fee or, more recently, in exchange for advertising. Depending on the user facilities — whether a business or personal residence — access can involve dial-up to a local or a toll-free number at different speeds, or direct access to the user's server via one of several high-speed access technologies. The largest ISP in the United States today is America Online, to which approximately half the households in the United States subscribe. There also are many national ISPs with recognizable names, such as AT&T Worldnet, MCI WorldCom/UUNet, Mindspring/Earthlink, and PSINet, as well as thousands of smaller regional ISPs that provide service to businesses and households.

The Internet access market has several features that make it an interesting case to examine. Facilities for similar activity existed prior to commercialization, but there was reason to expect problems during migration into commercial use. The Internet appeared to possess idiosyncratic technical features and uneconomic operational procedures that made it unsuitable in other settings. Exclusive use of the Internet by academics and researchers fostered cautious predictions that unanticipated problems would abound and that commercial demand might not materialize. However, in sharp contrast to cautious expectations, the ISP market displayed three extraordinary features.

First, this market grew rapidly, attracting thousands of entrants and many users, and quickly achieved mass-market status. Second, firms offering ISP service became nearly geographically pervasive, a pattern of diffusion rarely found in new infrastructure markets. Third, firms did not settle on a standard menu of services to offer, indicative of new commercial opportunities and a lack of consensus about the optimal business model for this opportunity. These patterns underlay a number of puzzles and questions.

Concern over the potential need to redefine universal service to account for Internet-related services and other combinations of communication and computing, for example, have motivated me and others to study the geographic spread of commercial ISPs. In two papers, Thomas Downes and I[1] characterize the location of over 40,000 access points of presence — local phone numbers offered by commercial ISPs — in 1997 and 1998. In these studies, we establish that the U.S. commercial ISP market is comprised of thousands of small, geographically dispersed local markets for Internet access. There is no single structure that characterizes the ISP market across the country. Nor should we expect this heterogeneity to disappear.

Further, over 90 percent of the U.S. population has access to a competitive local ISP market. Approximately 5 percent of the U.S. population lives in areas with no access to any providers, and approximately 5 percent lives on the margin between easy access and no access. These percentages reflect increased access over time.

Third, whether significant differences exist between the experiences of Internet users in urban and rural settings depends on the extent to which national and local firms provide similar services. National firms primarily serve urban areas and compete with regional and local firms. Local and regional firms primarily serve rural areas and less densely populated areas.

To understand the diffusion of Internet technology, it is important to analyze how the technology is commercialized. The Internet is not a single invention, diffusing across time and space without changing form. Instead, it is a suite of communication technologies, protocols, and standards for networking between computers. This suite is not valuable by itself. It obtains economic value in combination with complementary invention, investment, and equipment. How do vendors construct viable and ongoing economic entities in an evolving and technically intensive marketplace such as this?

Explaining the variety of approaches that firms take to developing new services in technology-intensive markets has long been a topic of discussion in the economics of technology, industrial organization, and economic growth. In this vein, two of my papers[2] deal with the service offerings of ISPs. I present data on the services of ISPs in the summer of 1998, by which time the Internet access industry had undergone its first wave of entry and many ISPs had begun to offer services other than basic access. These papers develop and apply a code that classifies these services and establish that there is significant heterogeneity across ISPs in the propensity to offer services, including networking, hosting, and web design. Indeed, an unconditional urban/rural difference exists in ISP service.

Most of the explained variance in ISP behavior arises from firm-specific factors, though. Firm-specific determinants — including a firm's geographic scope, its investments, and its focus on nontechnical users — are pivotal to the offering of nonbasic services. Location-specific determinants, such as urbanization and the presence of professionals, seem to be less important.

Furthermore, new services tend to cluster together at firms and to be available more frequently in high-

density areas. This outcome is partly influenced by economics of scope between old and new services. More generally, the firm-specific factors that are associated with new services, such as firm size and a focus on satisfying market demand by unsophisticated users, are disproportionately found in ISPs located in urban areas.

Finally, I[3] address the question of why commercialization went so well. Aside from defying expectations about government-managed technologies, this market has three traits — rapid growth, geographic pervasiveness, and the absence of settlement — that do not inherently go together in most markets. The presence of restructuring also should have interfered with rapid growth and geographic expansion.

Nonetheless, commercialization did not give rise to many of the anticipated technical and operational challenges. For a variety of economic reasons, entrepreneurs quickly learned that the Internet access business was commercially feasible. ISPs began offering commercial service after making only incremental changes to familiar operating procedures borrowed from the academic setting. It was technically easy to collect revenue at what used to be the gateway functions of academic modem pools. Moreover, the academic model of Internet access migrated into commercial operation without any additional new equipment suppliers.

Furthermore, Internet access was malleable as a technology and as an economic unit. While commercialization did give rise to the restructuring of Internet access to suit commercial users, the restructuring did not stand in the way of diffusion, nor did it interfere with the initial growth of demand.

Privatizing Internet access also fostered customizing Internet access technology to a wide variety of locations, circumstances, and users. As it turned out, the predominant business model was feasible on a small scale, and thus at low levels of demand. This meant that the technology was commercially viable at low densities of population, whether it was part of a national branded service or a local geographically concentrated service. Thus, privatization transferred the operation of the technology to a new set of decisionmakers who had new ideas about what could be done with it. Since experimentation was not costly, the technology perhaps could be adapted in new uses, new locations, new market settings, new applications, and in conjunction with other lines of business. While many attempts at adapting it failed, a large number of them also succeeded. These successes went well beyond what anyone would have forecast by simply examining the limited uses for the technology by noncommercial users prior to 1992.

Finally, the NSF was lucky in a particular way. It enabled the commercialization of the Internet access industry at a propitious moment, the time of the growth of an enormous new technological opportunity: the World Wide Web. This invention of ISPs motivated further experimentation to take advantage of the new Web opportunity, which, as it turned out, thrived under market-oriented and decentralized decisionmaking.

Many open questions remain in this industry. What principles should economists use for measuring services in this industry? In the future, I would like to examine ISP pricing behavior and structural changes in their portfolio of services. Studies of these activities and changes should provide a window on how Internet technology has to be packaged to provide value to commercial users.

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[1] *T. Downes and S. Greenstein, "Do Commercial ISPs Provide Universal Access?," in* Competition, Regulation, and Convergence: Current Trends in Telecommunications Policy Research, *S. Gillett and I. Vogelsang, eds. Mahwah, NJ: Lawrence Erlbaum Associates, 1999, pp. 195–212; "Universal Access and Local Commercial Internet Markets," working paper, June 2000.*

[2] *S. Greenstein, "Commercialization of the Internet: The Interaction of Public Policy and Private Actions," in* Innovation, Policy, and the Economy, *A. Jaffe, J. Lerner, and S. Stern, eds. Cambridge, MA: MIT Press, 2000 (also found at http://www.nber.org/books/innovation/index.html); and "Building and Delivering the Virtual World: Commercializing Services for Internet Access," NBER Working Paper No. 7690, May 2000.*

[3] *S. Greenstein, "Empirical Evidence on Commercial Internet Access Providers' Propensity to Offer New Services," in* Select Papers from the 26th Annual Telecommunications Policy Research Conference, *B. Compaign and I. Vogelsang, eds. Cambridge, MA: MIT Press, 2000.*

Globalization and Macroeconomics

Maurice Obstfeld*

Although the U.S. economy has become increasingly open over the postwar period, by standard measures the United States remains surprisingly insular. For example, the ratio of U.S international trade to GDP, which stood at only 4.6 percent in 1960, by 1999 was 12.2 percent, nearly three times higher. Still, this is small in absolute terms relative to the trade shares of most smaller economies.[1]

Despite the seeming insularity of the U.S. economy, global considerations have been prominent determinants of American economic policy in recent years. The effect of international trade on the U.S. wage distribution is a key issue in our domestic debates over further trade liberalization and the World Trade Organization. Growing global competition in the financial services industry has progressively undermined the web of financial restrictions that Congress enacted during the Great Depression. Correspondingly, concern for the stability of world capital markets has played a central role in some Federal Reserve actions, including decisions over interest rates.

Since the earliest days of systematic economic analysis, economists have sought to understand how the openness of economies affects their responses to disturbances occurring both at home and abroad. Indeed, the 1999 Nobel Memorial Prize in Economics was presented to Robert A. Mundell in large part for his pioneering studies of the links among economic policy, monetary arrangements, and the degrees of international capital and labor mobility. My recent research concentrates on four sets of questions in international macroeconomics. First, how integrated are world markets, and what does the degree of integration imply for macroeconomic phenomenons? Second, how can we model the open economy in a way that is useful for guiding policy? Third, what are the implications for international monetary arrangements? Fourth, what forces have promoted international economic integration, specifically the integration of capital markets?

Global Economic Integration

Over the past 50 years, technological and political changes have steadily chipped away at the barriers separating nations. As a result, the world is a much smaller place now than it was just after World War II. Labor mobility among nations generally remains low, a fact central to national decisions about exchange rate systems (see below). But along other dimensions, cross-border economic flows have increased dramatically. How far short of the ideal of a single, integrated global marketplace for goods, services, and capital is the world's collection of individual national markets now?

In a broad overview of the integration of world capital markets, I document the conflicting messages sent by different measures of international capital mobility.[2] While the markets for some assets appear to be tightly integrated — for example, the prices of similar nominally risk-free securities are now closely arbitraged without capital-account controls and political risks — other indicators of capital mobility suggest that significant segmentation remains. For example, investors still display an extreme home bias in their choice of equity holdings. Currently, American investors hold around 12 percent of their equity wealth in foreign stock markets, up sharply from a few years back, but still hard to rationalize within standard models of rational risk-averse agents. Related to the home equity bias is a second puzzle: movements in national per capita consumption appear broadly unrelated to movements in world per capita consumption. This is in contrast to the predictions of benchmark models of efficient international risk sharing.[3]

A third capital-market puzzle, the "Feldstein-Horioka puzzle," is that countries' average saving and investment rates appear closely linked over long periods. Although the magnitude of the saving-investment correlation has declined over time among industrial countries, it remains far higher than the corresponding correlation for subnational regions. Thus, despite the likelihood of independent shifts in national saving behavior and investment opportunities, countries' current account balances, which measure their net accumulations of foreign assets, are surprisingly small.[4]

While attempts to assess the integration of national asset markets have tended to yield conflicting results, attempts to measure the international integration of goods markets yield a much clearer verdict. Despite the trend of postwar trade liberalization and much technological progress, national goods markets appear to remain remarkably isolated from global influences over the medium term. There are big cross-border discrepancies even in the prices of very similar tradable goods, and changes

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in nominal exchange rates are associated with commensurate and very persistent changes not only in real exchange rates (defined as relative national price levels), but in the relative prices of similar tradable products. However, the feedback of these exchange rate-induced relative price changes into the real economy is extremely slow and difficult to detect in the short run; there often appears to be a high-frequency "disconnect" between exchange rates and the real economy.[5] The measured half-lives for disturbances to real exchange rates can be as high as four years. Moreover, there is now considerable evidence that producers of differentiated goods "price to market"; that is, they engage in third-degree price discrimination across consumers in different countries and, in particular, fail to offset nominal exchange rate movements through equal price adjustments.[6]

Alan M. Taylor and I, using disaggregated data on consumer prices, estimate a "threshold autoregressive" model in which the costs of international trade discourage arbitrage within a "band of inaction" whose width depends on the magnitude of the costs. We argue that the measured persistence of international price differentials is consistent with a rapid elimination of price discrepancies in excess of trade costs. Standard autoregressive estimates may confound an absence of mean reversion when there are small price discrepancies with more rapid band-reversion in the face of large discrepancies.[7]

A distinct piece of evidence on the segmentation of goods markets comes from studies of the home bias in international trade. Even after controlling for distance, per capita income, and other trade determinants suggested by gravity models of trade, there appears to be an inexplicable and large tendency for regions within countries to trade much more with each other than with residents of foreign countries.[8]

In recent work, Kenneth S. Rogoff and I suggest a reconciliation of the puzzling evidence on the integration of national goods and asset markets. Using simple models, we show that the presence of plausibly sized costs of international trade *in goods markets* can go remarkably far in explaining a series of international macroeconomic anomalies, in asset markets *as well* as in goods markets.[9] The international trade costs we have in mind include transport costs, tariffs, and nontariff trade barriers, as well as any costs that may be associated with international payments, exchange rate volatility, different regulatory environments, national business practices, and so on.

For example, costs of trade can give rise to large incipient international differentials in real interest rates. These would dampen the current account imbalances that countries desire, notwithstanding perfect cross-border arbitrage of the nominal returns on riskless assets. Similarly, trade costs impair the international sharing of consumption risks. That effect can greatly reduce the motive to hold foreign assets, thereby promoting a large home equity bias. In the paper, we also argue that realistic trade costs (unrelated to distance) can generate substantial biases in commodity trade, while also helping to resolve the low consumption correlations puzzle and the puzzles of international goods pricing.

Of course, my work with Rogoff does not argue either that asset markets are perfect in reality or that there are no distortions intrinsic to international asset trade. The point is simply that without assuming that international asset markets are markedly less efficient than domestic ones, one can still go surprisingly far in resolving international asset market anomalies based on the costs of international goods trade. Even with low costs of international asset transactions — high international capital mobility — distortions in goods markets can seriously impair the functions of capital markets.

The New Open Economy Macroeconomics

A full resolution of the international goods pricing puzzles requires, alongside trade costs, the presence of nominal rigidities in the prices of goods and labor. The point of departure for the classic work of Mundell and J. Marcus Fleming on open-economy macroeconomics was a marriage of Keynesian price stickiness to high-speed international interest rate arbitrage. Since the 1960s when the modern global capital market was born, that perspective has proved extremely fruitful both for policy analysis and for the exploration of positive issues, such as the sources of exchange rate volatility.

However, the Mundell-Fleming model and its offshoots fail to capture a number of economic relationships that are critical to understanding open-economy dynamics in a world of capital mobility. For example, the models lack any basis for incorporating actors' intertemporal constraints or decision processes, thereby making impossible rigorous welfare calculations or an analysis of current accounts and government deficits.

During the 1970s and 1980s, researchers developed an intertemporal analysis of the current account and global interdependence. Important as the advance was, the initial generation of intertemporal models was simplified by assuming flexible nominal prices in product and labor markets. [10] That compromise left them ill-equipped to address the important shorter-run business cycle issues that preoccupied Mundell and Fleming. However, building on closed-economy New Keynesian approaches to macroeco-

nomics and on international trade models with imperfect competition, a new approach to open-economy macroeconomics recently has succeeded in incorporating nominal rigidities into fully dynamic models.

In early work in this vein, Rogoff and I incorporated sticky product prices into a two-country macroeconomic model with monopolistic producers and intertemporally maximizing consumers. That framework enabled us not only to investigate the dynamic effects of macroeconomic shocks, but also to conduct a rigorous welfare analysis of the repercussions of those shocks, both in the originating country and abroad. One important consequence of that work was to throw doubt on earlier ad hoc models of international policy optimization. Those models assumed that national welfare was related to a laundry list of endogenous macro outcomes (the terms of trade, output, inflation, current account — basically, whatever suited the needs of the moment). In the framework that Rogoff and I developed, the basic interrelations among such endogenous variables, and their joint ultimate effect on national welfare, are clarified.[11]

In subsequent work, Rogoff and I adapt the new open economy macroeconomics framework to an explicitly stochastic setting. Our model allows one to solve explicitly not only for equilibrium first moments of endogenous variables, but for their equilibrium variances and covariances.[12] That extension opens up a range of new applications. Among them are the effects of policy variability on exchange rate levels and risk premiums; the effects of variability on the levels of preset nominal prices and, hence, on resource allocation; and the exact welfare analysis of macroeconomic policy rules and exchange rate regimes.[13] Within such stochastic models, one can finally hope to address some of the fundamental welfare costs of exchange-rate variability that underlie Mundell's celebrated concept of the optimum currency area, but that have eluded formal modeling until recently. Already a number of interesting extensions of the stochastic new open-economy macro model exist, including pricing to market and its implications for policy regimes.[14]

Related dynamic frameworks based on models with microfoundations, sticky prices, and monopolistic competition have been used recently to assess monetary policy rules in domestic (closed-economy) settings. Parallel open-economy welfare analyses are now beginning to emerge. While much work still lies ahead, we can now hope to evaluate international monetary arrangements at the same level of rigor that is applied already to understanding the long-run effects of tax policies.

Choosing Exchange Rate Regime: Flexibility and Credibility

While the new open-economy macroeconomics provides a firmer foundation for intertemporal policy analysis than the earlier Mundell-Fleming approach, it does not overturn (except in special and implausible models) a central insight that was at the core of Mundell's analysis of the optimum currency area. When prices are sticky and labor is internationally immobile, country-specific shocks can be weathered most easily if the exchange rate is flexible. Indeed, if region-specific shocks are sufficiently variable and large within a candidate currency area, then the flexibility benefits from retaining region-specific currencies may outweigh the allocation costs of having several currencies, rather than one, trading at uncertain mutual exchange rates.

One important factor omitted from the Mundellian calculus has come to the fore in recent international monetary experience: the credibility of domestic monetary institutions and of the exchange rate regime. Depending on the circumstances, credibility can be a two-edged sword, cutting in favor of either floating or fixed exchange rates.

Even when a country announces and maintains a par value for its currency's exchange rate, circumstances normally will arise in which the country wishes it could change the exchange rate. The country will do so, devaluing or revaluing its currency, if the short-run benefits outweigh whatever costs the government perceives from reneging on its previous promise to maintain the currency at par. Indeed, in the face of severe adverse country-specific shocks and under capital mobility, speculative expectations of devaluation can raise domestic interest rates sharply, thereby making devaluation more probable and possibly hastening its occurrence.

This credibility problem of pegged exchange rates makes the exchange rate less predictable and may imply welfare benefits far below those that a credibly fixed exchange rate might confer. Furthermore, without some high-cost commitment mechanism to bind policymakers to the fixed exchange rate, the arrangement could be unstable, absent strict and effective controls on capital flows. This latter prediction seemed exotic when I first suggested it in the mid-1980s,[15] but the experience of the 1990s — including the European currency crises of 1992–3, the Latin American "Tequila" crisis of 1994, and the worldwide financial crises of 1997–8 — have driven many observers to the same conclusion. In fact, relatively few countries have succeeded in maintaining a fixed exchange rate even for a period of five years.[16]

Some of my recent work, inspired by the European and Tequila crises, has modeled mechanisms through

which investor expectations can interact with the political and economic objectives of policymakers, yielding multiple equilibriums in which speculation against a currency can result in a realignment that would not have occurred otherwise.[17] The 1997–8 crisis, especially as it unfolded in Asia, led to a veritable explosion of research on alternative models of currency crisis. Many of the resulting papers modeled crises as shifts from benign to malign equilibriums.[18]

Governments of the major currency areas developed fairly strong monetary policy institutions (such as independent central banks) after the inflationary excesses of the 1970s. They seem to have concluded that, despite inexplicable exchange rate volatility, the quicker and less painful adjustment that exchange rate flexibility allows far outweighs the putative gains from fixed exchange rates — gains that, in any case, would be sharply reduced by the inherently low credibility of exchange rate commitments.[19] The governments of such smaller countries as Australia, Canada, and New Zealand have reached this conclusion too, and the practice of floating is becoming more widespread even in the developing world, as Mexico's recent experience illustrates.

Still, there are more than a few cases in which the difficulty of building credible domestic policy institutions is such that high inflation can be controlled only through some extreme commitment mechanism centered on a fixed exchange rate. Argentina, in the wake of hyperinflation in 1991, wrote into its constitution a currency board system under which all base money is backed by foreign reserves and domestic pesos are convertible into dollars at a 1:1 rate. In cases like Argentina's, the credibility of the exchange rate commitment is greatly enhanced by political consensus based on a widespread fear of lapsing into the monetary instability of the past. Paradoxically, countries with strong domestic monetary institutions might lack the ability to credibly fix their exchange rates, in part because the alternative to fixed rates is not unthinkable. But even the currency boards have been tested by speculators and, in some cases, have come close to shattering. Perhaps the ultimate sacrifice of policy autonomy in the interest of credibility is to adopt a foreign currency altogether, as in Ecuador's recent decision to "dollarize" its economy.

By adopting a shared currency, the eleven founding members of the European Economic and Monetary Union (EMU), soon to be joined by Greece, have eliminated the credibility problem of mutually pegged exchange rates. After the currency instability of 1992–3, prospective euro zone members were able to make a relatively smooth transition to the common currency in large part because of their countries' overarching political objective of maintaining stable exchange rates so as to qualify for the first wave of EMU in January 1999.[20] Low labor mobility within Europe — indeed, locational and occupational mobility even within individual EMU members are surprisingly low — implies that these countries do not form an optimum Mundellian currency area.[21] Thus, it is no surprise that in the initial two years of the euro, individual EMU members have experienced a wide range of macroeconomic conditions that certainly would have warranted divergent interest rates and exchange rate changes under country-specific monetary policies. While the political costs of exiting the EMU probably are prohibitive, it remains to be seen whether the non-EMU members of the European Union — Denmark, Sweden, and the United Kingdom — will find the political advantages of joining decisive. In purely economic terms, it is hard to argue that they have suffered much (if at all) from their retention of national currencies.

In my work on monetary regimes, I argue that strong domestic monetary institutions — institutions that largely overcome dynamic consistency problems — make fixed exchange rates much less attractive. One might still ask whether some form of international monetary coordination mechanism is helpful at the stage where countries put into place their domestic institutions. After all, if a policy institution is designed simply to address domestic problems, might its creation not involve spillover effects abroad that could be internalized through coordinated institution-building by several countries? Perhaps surprisingly, there seems to be little scope for such coordination, as Rogoff and I show.[22] The more effective national monetary policy rules are in eliminating economic inefficiencies, the closer those rules will be to what a benevolent world monetary authority would choose. Our preliminary numerical experiments suggest that the welfare differences between coordinated and uncoordinated (Nash equilibrium) rules are tiny indeed.

Whither Globalization?

Even if the world's economies, including its richest ones, are far from full economic integration, the clear trend is toward increasingly closer integration of goods and asset markets. Is that trend likely to continue? My own research in this area focuses on the asset-market side of globalization.

A major reason countries have pursued capital account liberalization is the prospect of economic efficiency gains analogous to those that free trade in goods and services delivers. Conversely, controls on international capital movement are difficult and costly to enforce for any period of time and have become progressively

harder to maintain as international product trade has expanded. While capital-account liberalization in principle has distributive effects similar to those of trade liberalization, the political opposition to freer trade in capital has not (at least in recent decades) been nearly as visible as opposition to freer trade in goods. Here, too, attempts to reach international agreement have suffered setbacks.

Potential gains to global trade in assets come from a number of sources, including a better allocation of the world's savings and more effective risksharing among countries. Harold Cole and I made an early attempt to quantify the potential benefits from the international sharing of consumption risks. We found them to be quite small, generally well below 1 percent of GDP per year.[23] In subsequent work, I applied individual preferences that separate attitudes toward risk from those toward intertemporal substitution, and, more importantly, I allowed for settings in which risk diversification can affect investment and growth.[24] These changes, especially the second one, can magnify the potential gains from international portfolio diversification, sometimes manyfold.

Free international capital mobility can compromise national sovereignty over economic policies, however. One symptom of this is what Alan M. Taylor and I have labeled the "trilemma" of the exchange rate (a proposition recently associated with Mundell's work, but actually familiar much earlier to writers such as John Maynard Keynes). Countries can choose at most two items from the following list of three: free mobility of capital, a fixed exchange rate, and a monetary policy oriented toward domestic goals. Taylor and I argue that the widespread use of floating exchange rates has, in fact, promoted capital account liberalization by permitting countries to pursue domestically oriented monetary policies even in the presence of free cross-border asset transactions. Of course, where countries have adopted fixed rates, either to banish a legacy of economic policy abuse (Argentina) or in the interest of political goals (EMU), we see capital mobility, but a renunciation of active monetary policy.[25] This is a different choice from among the three possible options that the trilemma offers. Either way, most countries are moving to options that involve open capital markets.

Another realm in which capital mobility may threaten national sovereignty is that of tax policy. If capital can flee high-tax jurisdictions, then tax competition will force capital taxes downward, and countries will be driven to rely increasingly on taxes on labor. In the extreme, governments could find themselves unable to provide the services and infrastructure that their electorates desire without imposing a crushing fiscal burden on workers.[26] In my own work, I argue that we remain quite far from this extreme outcome, and, if we should draw much closer, international coordination of capital income taxation would be a far superior approach to restricting capital movements.[27]

This is not to say that there are no problems intrinsic to a globalized capital market in a world of sovereign nations — far from it. Globalization is like a powerful new medicine, one that offers immense possible benefits but must be used with caution because of the possible side effects. Domestic financial stability is endangered when countries open up their capital markets without adequate institutional safeguards against excessive risk taking. That lesson was underscored by the Asian crisis of 1997–8. By extension, connections between national markets and inconsistencies among the many different national supervisory regimes can create conditions in which a global crisis may occur (as we also saw in 1997–8). Attempts are under way to address these structural flaws, and the future of the global capital market ultimately will depend on their success.

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1 *The customary definition of "trade," in the present context, is the average of exports and imports.*

2 *See M. Obstfeld, "International Capital Mobility in the 1990s," in* Understanding Interdependence: The Macroeconomic of the Open Economy, *P. B. Kenen, ed. Princeton, NJ: Princeton University Press, 1995.*

3 *On the recent behavior of the home equity bias, see M. Obstfeld and K. S. Rogoff, "Perspectives on OECD Economic Integration: Implications for U.S. Current Account Adjustment," paper presented at the Federal Reserve Bank of Kansas City annual policy symposium, Jackson Hole, Wyoming, August 24–6, 2000. (This paper is at http://elsa.berkeley.edu/~obstfeld/index.html) Direct evidence on the low degree of international consumption risksharing is presented in M. Obstfeld, "Are Industrial-Country Consumption Risks Globally Diversified?," in* Capital Mobility: The Impact on Consumption, Investment, and Growth, *L. Leiderman and A. Razin, eds. Cambridge, UK: Cambridge University Press, 1994. For a recent survey of literature on both home equity bias and limited international consumption correlations, see K. Lewis, "Trying to Explain the Home Bias in Equities and Consumption,"* Journal of Economic Literature, *37 (June 1999), pp. 571–608.*

4 *The "Feldstein-Horioka coefficient," which is the result of a cross-section regression of domestic investment rates on national saving rates, is now not too far off from the value prevailing under the pre-1914 gold standard. (Of course, data inadequacies and the nature of the pre-1914 country sample warrant great caution in making comparisons over time.) See M. T. Jones and M. Obstfeld, "Saving, Investment, and Gold: A Reassessment of Historical Current Account Data," NBER Working Paper No. 6103, July 1997, and in* Money, Capital Mobility, and Trade: Essays in Honor of Robert A. Mundell, *G. A. Calvo, R. Dornbusch, and M. Obstfeld, eds. Cambridge, MA: MIT Press, 2000.*

5 *The disconnect is apparently reduced in conditions of very high inflation, when nominal exchange rate changes indeed*

feed through to consumer prices very quickly. But the high correlation between real and nominal exchange rates seems to reassert itself once inflation has been tamed. See M. Obstfeld, "Open-Economy Macroeconomics: Developments in Theory and Policy," NBER Working Paper No. 6319, June 1999, and Scandinavian Journal of Economics, *100 (January 1998), pp. 247–75.*

[6] *For a survey on international price discrepancies, see K. S. Rogoff, "The Purchasing Power Parity Puzzle,"* Journal of Economic Literature, *34 (June 1996), pp. 647–68. An insightful evaluation of the evidence on international pricing to market is given by P. K. Goldberg and M. M. Knetter, "Goods Prices and Exchange Rates: What Have We Learned?," NBER Working Paper No. 5862, December 1996; and* Journal of Economic Literature, *35 (September 1997), pp. 1243–72.*

[7] *See M. Obstfeld and A. M. Taylor, "Nonlinear Aspects of Goods-Market Arbitrage and Adjustment: Heckscher's Commodity Points Revisited," NBER Working Paper No. 6053, June 1997, and* Journal of the Japanese and International Economies, *11 (December 1997), pp. 441–79. See also A. M. Taylor, "Potential Pitfalls for the Purchasing-Power-Parity Puzzle? Sampling and Specification Biases in Mean-Reversion Tests of the Law of One Price," NBER Working Paper No. 7577, March 2000, and* Econometrica, *forthcoming.*

[8] *A survey is offered by J. F. Helliwell,* How Much Do National Borders Matter? *Washington, D.C.: Brookings Institution, 1998.*

[9] *See M. Obstfeld and K. S. Rogoff, "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?," NBER Working Paper No. 7777, July 2000, and in* NBER Macroeconomics Annual 2000, *B. S. Bernanke and K. S. Rogoff, eds. Cambridge, MA: MIT Press, 2000.*

[10] *The literature is surveyed in M. Obstfeld and K. S. Rogoff, "The Intertemporal Approach to the Current Account," NBER Working Paper No. 4893, April 1996, and in* Handbook of International Economics, *Volume 3, G. M Grossman and K. S. Rogoff, eds. Amsterdam: Elsevier Science Publishers, 1995.*

[11] *M. Obstfeld and K. S. Rogoff, "Exchange Rate Dynamics Redux," NBER Working Paper No. 4693, March 1996, and* Journal of Political Economy, *103 (June 1995), pp. 624–60. See also M. Obstfeld and K. S. Rogoff,* Foundations of International Macroeconomics. *Cambridge, MA: MIT Press, 1996.*

[12] *The original paper is M. Obstfeld and K. S. Rogoff, "Risk and Exchange Rates," NBER Working Paper No. 6694, August 1998.*

[13] *Some of these applications are illustrated in M. Obstfeld and K. S. Rogoff, "New Directions for Stochastic Open-Economy Models," NBER Working Paper No. 7313, August 1999, and* Journal of International Economics, *50 (February 2000), pp. 117–53.*

[14] *See, for example, M. B. Devereux and C. Engel, "Monetary Policy in the Open Economy Revisited: Price Setting and Exchange Rate Flexibility," NBER Working Paper No. 7665, April 2000*

[15] *See M. Obstfeld, "Floating Exchange Rates: Experience and Prospects," NBER Reprint No. 792, December 1986, and* Brookings Papers on Economic Activity, *2 (1985), pp. 369–450.*

[16] *For evidence and discussion, see M. Obstfeld and K. S. Rogoff, "The Mirage of Fixed Exchange Rates," NBER Working Paper No. 5191, July 1995, and* Journal of Economic Perspectives, *9 (Fall 1995), pp. 73–96. Argentina now must be added to the select club of long-term fixers that Rogoff and I identified in that paper, but Thailand's exchange rate, surprisingly still fixed in 1995, crumbled in 1997—with repercussions that soon were felt worldwide.*

[17] *See M. Obstfeld, "The Logic of Currency Crises," NBER Working Paper No. 4640, September 1994, and* Cahiers Économiques et Monétaires *(Paris: Banque de France), 43 (1994), pp. 189–213; "Models of Currency Crises with Self-Fulfilling Features," NBER Working Paper No. 5285, February 1997, and* European Economic Review, *40 (April 1996), pp. 1037–47; and "Destabilizing Effects of Exchange Rate Escape Clauses," NBER Working Paper No. 3603, February 1998, and* Journal of International Economics, *43 (August 1997), pp. 61–77.*

[18] *Some of the mechanisms at work in Asia are described in M. Obstfeld "The Global Capital Market: Benefactor or Menace,?" NBER Working Paper No. 6559, May 1998, and* Journal of Economic Perspectives, *12 (Fall 1998), pp. 9–30. See also my panel discussion contribution in* Beyond Shocks: What Causes Business Cycles? *Boston: Federal Reserve Bank of Boston, 1998.*

[19] *For a more detailed assessment of floating exchange rates in practice, see M. Obstfeld, "International Currency Experience: New Lessons and Lessons Relearned,"* Brookings Papers on Economic Activity, *1 (1995), pp. 119–220.*

[20] *For discussions of the transition, see M. Obstfeld, "Europe's Gamble,"* Brookings Papers on Economic Activity, *2 (1997), pp. 241–317; "A Strategy for Launching the Euro," NBER Working Paper No. 6233, March 1999, and* European Economic Review, *42 (June 1998), pp. 975–1007; and "EMU: Ready or Not?," NBER Working Paper No. 6682, August 1999, and in* Princeton Essays in International Finance *209, July 1998.*

[21] *For a more detailed discussion of economic adjustment in Europe, see M. Obstfeld and G. Peri, "Regional Nonadjustment and Fiscal Policy," NBER Working Paper No. 6431, June 1999, and* Economic Policy, *26 (April 1998), pp. 205–59; reprinted in* Intranational Economics, *E. van Wincoop and G. D. Hess, eds. Cambridge, UK: Cambridge University Press, 2000.*

[22] *M. Obstfeld and K. S. Rogoff, "Do We Really Need a New International Monetary Compact?," NBER Working Paper No. 7864, August 2000.*

[23] *H. Cole and M. Obstfeld, "Commodity Trade and International Risksharing: How Much Do Financial Markets Matter?,"* Journal of Monetary Economics, *28 (August 1991), pp. 3–24.*

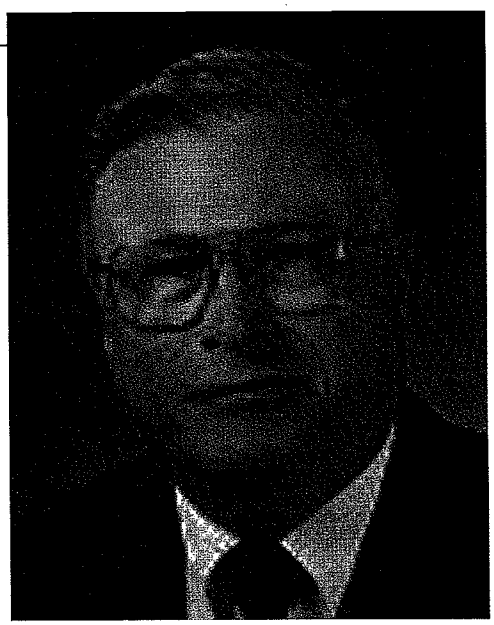
[24] *M. Obstfeld, "Evaluating Risky Consumption Paths: The Role of Intertemporal Substitutability,"* European Economic Review, *38 (August 1994), pp. 1471–86; and "Risk Taking, Global Diversification, and Growth,"* American Economic Review, *84 (December 1994), pp. 1310–29.*

[25] *M. Obstfeld and A. M.Taylor, "The Great Depression as a Watershed: International Capital Mobility over the Long Run," NBER Working Paper No. 5960, May 1999, and in* The Defining Moment: The Great Depression and the American Economy in the Twentieth Century, *M. Bordo, C. Goldin, and E. White, eds. Chicago: University of Chicago Press, 1998.*

[26] *For a prominent exposition of this scenario, see D. Rodrik,* Has Globalization Gone Too Far? *Washington, D.C.: Institute of International Economics, 1997.*

[27] *See M. Obstfeld, "The Global Capital Market: Benefactor or Menace?," op. cit.*

NBER Profile: *Michael P. Dooley*



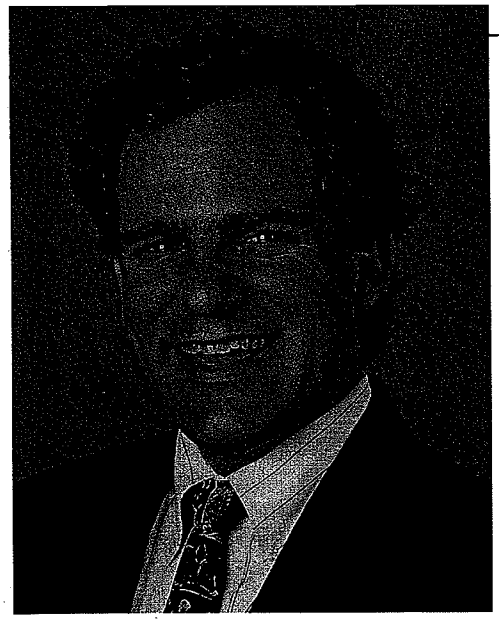
Michael P. Dooley is a Research Associate in the NBER's Program in International Finance and Macroeconomics and a professor of economics at the University of California, Santa Cruz (UCSC). He joined the faculty at UCSC in 1992 following more than 20 years of service at the Board of Governors of the Federal Reserve System and in the Research Department of the International Monetary Fund.

Dooley's research covers a range of issues in open economy macroeconomics, including crises in emerging markets, debt management, capital controls, capital flight, and liberalization of financial markets. He is also managing editor of the *International Journal of Finance and Economics.*

Dooley has been a visiting professor at Bucknell University, George Washington University, the University of Texas, University of Chicago Graduate School of Business, the IMF Institute, the World Bank Economic Development Institute, and the Kiel Institute of World Economics. He has also served as a consultant to the International Monetary Fund, World Bank, the Federal Reserve Board, and the Bank of Japan.

In his leisure time, Dooley enjoys fishing, golf, and telling stories about his grandsons.

NBER Profile: *Shane M. Greenstein*



Shane M. Greenstein is a Research Associate in the NBER's Program on Industrial Organization and Productivity. He has been affiliated with the NBER since 1990.

Greenstein received a B.A. in economics from the University of California, Berkeley, in 1983 and a Ph.D. in economics from Stanford University in 1989. From 1990 to 1997, he was an assistant and then associate professor with the department of economics and the Institute of Government and Public Affairs at the University of Illinois in Urbana/Champaign. In 1997 he joined the Kellogg Graduate School of Management at Northwestern University as an associate professor. At Kellogg, he teaches in the MBA and Ph.D. programs and is codirector of the new Center for Research in Technology, Innovation, and E-Commerce.

Greenstein's research interests cover a wide variety of topics in the economics of high technology. He has studied buyer benefits from advances in computing and communication technology, structural change in information technology markets, standardization in electronics markets, investment in digital infrastructure at private and public firms, the spread of the commercial Internet business, and government procurement of computing services. Greenstein also regularly writes a column about the computer market for *IEEE Micro*. Links to these columns are at http://www.kellogg.nwu.edu/faculty/greenstein/.

Greenstein is married to Dr. Ranna Rozenfeld, assistant professor at Northwestern University's medical school and attending physician in the intensive care unit at Children's Memorial Hospital. They live in Winnetka, Illinois, with their two children, Noah and Rebecca.

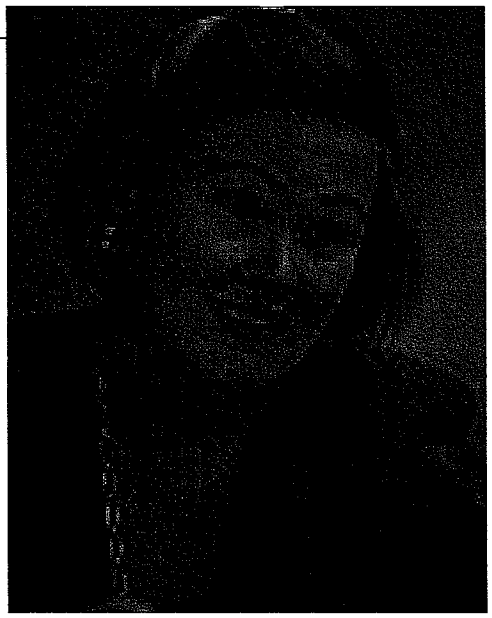
NBER Profile: *Angelo Melino*

Angelo Melino, a new Director of the NBER representing the Canadian Economics Association, is a Professor of Economics at the University of Toronto. He has been a member of that economics department since 1981 and a full professor since 1991.

Melino received his B.A. from the University of Toronto and his Ph.D. from Harvard University. He has also taught at the University of California, San Diego, and been a visiting consultant to the Bank of Canada. He has written papers on continuous-time econometrics, strikes, the term structure of interest rates, and pricing derivatives.

Angelo lives in Toronto with his wife, Effie, and their two daughters, Kate and Stacy. In his spare time, he enjoys softball, squash, and ballroom dancing.

NBER Profile: *Alicia H. Munnell*

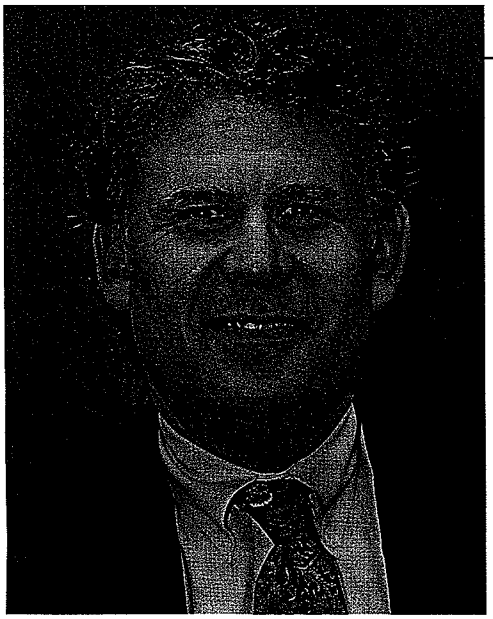


Alicia H. Munnell, a newly elected Director at Large of the NBER, is the Peter F. Drucker Professor in Management Sciences at Boston College's Carroll School of Management and Director of the Center for Retirement Research at Boston College.

Munnell earned her B.A. from Wellesley College and her Ph. D. in economics from Harvard University. Most of her professional career was spent at the Federal Reserve Bank of Boston, where she became Senior Vice President and Director of Research in 1984. She left the Boston Fed in 1993 to become Assistant Secretary of the U.S. Treasury for Economic Policy; she then moved to the President's Council of Economic Advisers where she was a Member from 1995-7. Munnell's teaching and research interests include tax policy, Social Security, and public and private pensions.

She was a co-founder and the first President of the National Academy of Social Insurance. She has also served on numerous advisory boards and panels, and is currently a member of the American Academy of Arts and Sciences and the Pension Research Council at Wharton.

Munnell lives on Beacon Hill with her Husband, Henry. On weekends when the weather is nice and she is not busy, she usually heads to her country home in Woodstock, Vermont where she practices tennis, does needlepoint, and takes her two grandchildren on picnics.



NBER Profile: *Michael Rothschild*

Michael Rothschild, Dean of the Woodrow Wilson School of Public and International Affairs and a Professor of Economics and Public Affairs at Princeton University, was elected to the NBER's Board of Directors in April 2000 to represent Princeton. He had been an NBER Research Associate since 1980.

Rothschild holds a B.A. from Reed College, an M.A. from Yale University, and a Ph.D. in economics from MIT. Before coming to Princeton he was Professor of Economics and Dean of Social Sciences at the University of California, San Diego. He also has taught at Harvard University and the University of Wisconsin, Madison.

Rothschild has written on a wide range of topics, including decision-making under uncertainty, investment, taxation, finance, jury decision processes, and higher education. He is a Fellow of the Econometric Society, the American Academy of Arts and Sciences, and the American Association for the Advancement of Science.

Rothschild is married to Lynn Kay Greenberg; together they have four adult sons and one grandchild. Rothschild's hobbies include squash, reading, and travel.

Conferences

Means-Tested Transfer Programs in the United States

The NBER held a conference on "Means-Tested Transfer Programs in the United States" on May 11 and 12 in Cambridge. Robert A. Moffitt, NBER and Johns Hopkins University, organized the following program:

Robert A. Moffitt, "The Temporary Assistance to Needy Families Program"
Discussant: Thomas E. MaCurdy, NBER and Stanford University

Janet Currie, NBER and University of California, Los Angeles, "U.S. Food and Nutrition Programs"
Discussant: Hilary W. Hoynes, NBER and University of California, Berkeley

Jonathan Gruber, NBER and MIT, "Medicaid" (NBER Working Paper No. 7829)
Discussant: David M. Cutler, NBER and Harvard University

Robert J. LaLonde, NBER and University of Chicago, "Employment and Training Programs"
Discussant: James J. Heckman, NBER and University of Chicago

David M. Blau, University of North Carolina, "Child Care Subsidy Programs" (NBER Working Paper No. 7806)
Discussant: James R. Walker, NBER and University of Wisconsin

Edgar O. Olsen, University of Virginia, "What Do We Know about the Effects of U.S. Housing Programs for the Poor? A Critical Appraisal of the Literature"
Discussant: John M. Quigley, University of California, Berkeley

Richard V. Burkhauser, Cornell University, and **Mary L. Daly,** Federal Reserve Bank of San Francisco, "The Supplemental Security Income Program"
Discussant: Kathleen McGarry, NBER and University of California, Los Angeles

Robert I. Lerman and **Elaine Sorenson,** Urban Institute, "Child Support: Interactions between Private and Public Transfers"
Discussant: Irwin Garfinkel, Columbia University

Mark R. Killingsworth, NBER and Rutgers University, "Wage Rate Subsidies"
Discussant: Lawrence F. Katz, NBER and Harvard University

V. Joseph Hotz, NBER and University of California, Los Angeles, and **John Karl Scholz,** NBER and University of Wisconsin, Madison, "The Earned Income Tax Credit"
Discussant: Jeffrey Liebman, NBER and Harvard University

The Temporary Assistance for Needy Families (TANF) program, established in 1996, replaced what previously was called the Aid to Families with Dependent Children (AFDC) program. TANF, like AFDC, primarily serves low-income single mothers and has as its central purpose the provision of cash support. The TANF program is distinguished from AFDC by strong work requirements and by time limits on receipt of benefits. **Moffitt** reviews the rules of the TANF program and discusses the research that has been conducted on it and on AFDC.

Currie explains that the U.S. government operates a wide variety of food and nutrition programs (FANPs) that reach an estimated one out of every five Americans every day. Her review focuses on the three largest programs: the Food Stamp Program; the Special Supplemental Nutrition Program for Women, Infants, and Children; and the National School Lunch Program. Some of the issues she raises concern the role of FANPs in an era when obesity presents a serious health problem; the effectiveness of FANPs as safety net programs; the value of in-kind versus cash benefits; and the likely effects of welfare reform on FANP participation.

Gruber examines the history, rules, and economic implications of the Medicaid program. He begins with a detailed overview of how the program works, and then provides information on spending patterns and on who is covered and eligible. Next he reviews the economic issues involved in studying the Medicaid program: assessing its impacts on insurance coverage (public and private), health, labor supply, family structure, and savings. He follows this with a review of the empirical literature on each of these topics. Gruber concludes with a discussion of the policy issues and unanswered questions surrounding the Medicaid program.

The passage of the Workforce

Investment Act in 1998 reaffirmed U.S. policymakers' commitment to reshaping and upgrading the skills and employment prospects of the nation's low-income, disabled, and displaced workers via publicly subsidized employment and training programs. While the orientation and goals of U.S. training policy have shifted frequently over the last 40 years, the menu of services provided to these disadvantaged groups has not changed very much. **LaLonde** examines the history of such programs, shows how policy objectives have shifted, and describes both the services subsidized by these programs and their users. In addition, he surveys the contributions of the literature to the field of program evaluation. Although LaLonde finds that economically disadvantaged youths have benefited little from these programs, his evidence for adults — especially adult women — is much different. These programs not only appear to consistently raise the earnings of adult women, but their internal rates of return also may be quite high relative to their typically low costs.

Child care and early education subsidies are an important part of government efforts to increase economic independence and improve development of children in low-income families in the United States. **Blau** describes the main subsidy programs in the United States, discusses economic issues that arise in designing such programs and evaluating their effects, and surveys evidence on the effects of the programs. All child-care and early education subsidies affect both work incentives and inputs to child development. But a subsidy designed specifically to achieve one of these policy goals usually will be relatively ineffective at accomplishing the other goal. Blau finds that child-care subsidies that reduce the effective price to parents of all purchased child care, regardless of the type and location of care, cause the employment rate of mothers of young children to increase. But the magnitude of the effect is uncertain. The most reliable evidence suggests that the effect is fairly small, but the range of estimates in the literature is quite large. The three main difficulties encountered in research on this issue are in finding appropriate control groups, accounting for the wide prevalence of unpaid child-care arrangements, and identifying the effect of the price of child care.

Olsen analyzes the justifications that have been offered for housing subsidies to low-income households and their implications for the evaluation and design of housing programs. He also describes the evolution of the rules regarding operation of the major housing programs for low-income households in the United States, and summarizes and appraises the evidence on the major effects of these programs. Olsen specifically considers the effects of these programs on: housing occupied by recipients of the subsidy; their consumption of other goods; the labor supply of recipients; the distribution of benefits among recipients and all eligible households; the types of neighborhoods in which subsidized households live; relationships with neighbors; and the cost-effectiveness of alternative methods for delivering housing assistance.

Burkhauser and **Daly** provide an overview of the Supplemental Security Income (SSI) program, a means-tested program that provides cash payments to the elderly, blind, and disabled. Begun in 1974, SSI is now one of the largest federal government means-tested programs, with over 6.6 million recipients in 1998. While it once primarily served an aged population, the majority of SSI recipients now are working-age adults and children with disabilities. To better understand why SSI grew, why the composition of SSI recipients changed, and how SSI is likely to evolve, the authors study SSI program rules and the behavioral responses they induce, placing each in the context of the broader social welfare system. After describing the program's eligibility criteria and benefit structure, the authors show that there continues to be substantial variation among states in both allowances and benefits. They then review trends in SSI growth and consider how changes in eligibility criteria, outreach efforts by the Social Security Administration and state governments, local economic conditions, and the generosity of SSI benefits relative to other programs have affected that growth. Finally, Burkhauser and Daly consider the role of SSI in protecting the economic well-being of low-income populations, discuss how recent changes in welfare policy are likely to affect SSI caseloads, summarize their findings, and discuss areas for future research.

Child support is a private transfer that is an integral part of the means-tested public transfer system. Support payments generally lower the budget costs of welfare as well the incentives for parents to participate. The Child Support Enforcement (CSE) program, which establishes and enforces support obligations, also affects the incentives of the non-custodial parent donors and ultimately the distribution of incomes. While not formally income-tested, CSE still targets low-income families because so many custodial families are poor. **Lerman** and **Sorenson** review the history of the CSE program, the economic rationale for the government's role, and trends in support awards and payments. The authors also examine the importance of child support to low-income families; the capacity of noncustodial parents to pay child support; trends in costs,

financing, and effectiveness of the CSE program; the effects of child support on behavior; equity issues in child support; and proposals for reform. Despite efficiency gains in the CSE program, especially in establishing paternity, the authors find that a shift in the composition of cases has offset these improvements, causing support payments per custodial mother to rise only modestly in real terms.

Killingsworth reviews wage subsidies, which are often seen as a macroeconomic stabilization tool or an antipoverty measure (or both). Marginal-employment subsidies, paid to employers who increase their employment, are more cost-effective than subsidies paid for all employment: the former policy does not subsidize workers who would have been employed even without a subsidy. "Targeted" subsidies, paid to employers for hiring disadvantaged workers, have been only modestly successful precisely because workers must identify themselves as disadvantaged (and thus possibly undermine their longevity with a particular employer) to qualify for subsidization. Recently, much attention has been paid to subsidies for actual or prospective employees. In the United States, subsidies paid to unemployed persons who find jobs have had only limited success in reducing joblessness and unemployment duration. However, experiences in other countries are somewhat more encouraging. Several experiments in the United States and Canada have evaluated the effect of "work incentive" programs, which make income-conditioned payments to persons only if they work a certain number of hours per week. The evidence suggests that such programs can significantly increase labor supply. However, somewhat less than half of those eligible to receive such payments actually do so.

Since its inception in 1975, the Earned Income Tax Credit (EITC) has grown into the largest federally funded, means-tested cash assistance program in the United States. **Hotz and Scholz** review the political history of the EITC, its rules and goals, and its growth and coverage. They also note that the predicted effects of the EITC are not all pro-work, especially with respect to hours and its labor market incentives for two-earner couples. They then summarize the existing empirical research on the behavioral effects of the EITC, emphasizing in particular the effects of the 1986, 1990, and 1993 expansions of the credit on labor force participation and hours of work. The literature provides consistent evidence, generated from a variety of empirical approaches, that the EITC positively affects labor force participation. There are also smaller, negative effects on hours of work for people already in the labor market and for secondary workers.

These papers and their discussions will be published by the University of Chicago Press in an NBER Conference Volume. In advance of that publication, they are available at "Books in Progress" on the NBER's web site.

International Evidence on Social Security and Retirement

On June 1 and 2, the NBER held a conference on social security systems and retirement around the world as part of a cross-national research effort to compare retirement income programs in a dozen developed countries, including the United States, and to evaluate how the various programs affect retirement decisions. In each country, demographic changes have placed increasing financial pressure on the social security systems, a situation that is compounded by an increasing number of workers who retire young.

An earlier phase of this same project culminated in a widely cited NBER volume on *Social Security and Retirement Around the World,* published by the University of Chicago Press in 1999. For each country, the book has a chapter describing the social security policy, the work and retirement incentives associated with that policy, and the age-specific patterns of retirement in that country. This initial set of studies suggests that the retirement policies themselves contribute to earlier retirement by often providing generous retirement benefits at young ages and imposing large financial penalties on labor earnings beyond the age of eligibility for retirement benefits. As a result of these policy incentives, there is a strong correspondence between the age at which benefits are available in each country and the age at which people tend to leave the labor force.

The June conference completed a second phase in this collaborative research effort. In this phase of the project, researchers from each country used micro-data (data on individuals and their labor force decisions) to model the incentive structure of the retirement systems and their effects on retirement more formally. Specifically, they asked how the provisions of the social security programs — interacting with the past and potential future earnings possibilities of individuals — influence the decisions about work and retirement that people make.

The micro-models consider the "accrual value" of social security for individuals as they age: the discounted value of any additional (or lost) social security benefits that people will obtain (or lose) by continuing to work. For most workers, and in most countries, the accrual value becomes negative at some age because workers must give up social security benefits without a compensating increase in their future benefit amounts if they continue to work. In studies presented at the June conference, investigators applied models to what might be gained from social security from working for more years. They show that forward-looking accrual measures are important influences on work and retirement decisions.

In every country, the micro-data analyses demonstrate a strong relationship between the social security provisions and retirement behavior. In the statistical estimations, the timing of retirement is influenced significantly by the accrual of benefits in the social security program. Simple simulations for each country also demonstrate how changes in the social security programs can lead to in some cases dramatic changes in retirement behavior. This has important implications for the design and reform of social security programs that can effectively accommodate the demographic changes of the coming decades.

The international social security project is directed by NBER Research Associates Jonathan Gruber, MIT, and David Wise, Harvard University. In addition to Gruber and Wise, the following people participated in the conference and presented work from their respective countries: Alain Jousten and Sergio Perelman (Belgium); Michael Baker and Kevin Milligan (Canada); Paul Bingley, Nabanita Gupta, and Peder Pedersen (Denmark); Didier Blanchet and Ronan Mahieu (France); Axel Börsch-Supan and Reinhold Schnabel (Germany); Agar Brugiavini (Italy); Takashi Oshio (Japan); Arie Kapteyn and Klaas de Vos (Netherlands); Sergi Jimenez-Martin and Franco Peracchi (Spain); Marten Palme and Ingemar Svensson (Sweden); Richard Blundell (United Kingdom); and Courtney Coile (United States).

The collection of studies presented at the conference will be published by the University of Chicago Press in *The Effect of Social Security and Retirement: Evidence from Around the World.* In advance of publication, they will be available at "Books in Progress" on the NBER's web site.

Eleventh Annual East Asian Seminar on Economics

The NBER's eleventh annual East Asian Seminar on Economics, "Trade in Services," took place in Seoul, South Korea, on June 22–4. Takatoshi Ito, NBER and the Ministry of Finance, Tokyo, and Anne O. Krueger, NBER and Stanford University, organized the program and chose the following papers for discussion:

Philippa Dee, Kevin Hanslow, and **Tien Phamduc,** Productivity Commission, Australia, "Measuring the Costs of Barriers to Trade in Services"

Discussants: Chang-Tai Hsieh, Princeton University, and Fukunari Kimura, Keio University

Aaditya Mattoo, The World Bank, "Shaping Future Rules for Trade in Services: Lessons from the GATS"

Discussants: Chang-Tai Hsieh and Anne O. Krueger

Richard H. Snape, Productivity Commission, Australia, "Regulating Services Trade: Matching Policies to Objectives"

Discussants: Takatoshi Ito, and Edwin Lai, City University of Hong Kong

Kun-Ming Chen, National Chengchi University; **Ji Chou, Nai-Fong Kuo,** and **Shiu-Tung Wang,** Chang-Hua Institution for Economic Research, "Taiwan's Accession into the WTO and Trade in Services: A Computable General Equilibrium Analysis"

Discussants: Ponciano Intal, De La Salle University, Manila, and June-Dong Kim, Korea Institute for International Economic Policy

Li-Min Hsueh, An-Loh Lin, and **Su-Wan Wang,** Chung-Hua Institution for Economic Research, "The Growth and Potential of Taiwan's Foreign Trade in Services"

Discussants: Philippa Dee, and Mario Lamberte, Philippine Institute for Development Studies

Jong-Il Kim, Dongguk University, and **June-Dong Kim,** "Impact of Services Liberalization on Productivity: The Case of Korea"

Discussants: Kazumasa Iwata, University of Tokyo, and Mahani Zainal-Abidin, University of Malaya

Nae-Chan Lee and **Han-Young Lie,** Korea Information Society Development Institute, "Korea's Telecom Services Reform through Trade Negotiations"

Discussants: Ramonette Serafica, De La Salle University, Manila, and Chayun Tantivasadakarn, Thammasat University

Sang In Hwang, Korea Institute for International Economic Policy, and **Inseok Shin** and **Jungho Yoo,** Korea Development Institute, "Liberalization of Financial Service Trade in Korea and the Impact"

Discussants: Kazumasa Iwata, and Nattapong Thongpakde, Thailand Development Research Institute

Kyoji Fukao and **Keiko Ito,** Hitotsubashi University, "Foreign Direct Investment and Service Trade: The Case of Japan"

Discussants: Mario Lamberte, and Chong-Hyun Nam, Korea University

Fukunari Kimura, "Globalization and Harmonization: The Case of Accountancy Services in Japan"

Discussants: Edwin Lai and Aaditya Mattoo

Shujiro Urata, Waseda University, and **Kozo Kiyota,** Keio University, "Service Trade in East Asia"

Discussants: Ponciano Intal and Richard H. Snape

Clement Yuk Pang Wong and **Anming Zhang,** City University of Hong Kong, "Private Sector's View of Trade Liberalization in Services: A Perspective from Hong Kong"

Discussants: Chong-Hyun Nam and Nattapong Thongpakde

Kuo-Liang Wang, National Chengchi University, and **Chung-Shu Wu,** Institute of Economics, Academia Sinica, "A Study of Competitiveness of International Tourism in the South East Asian Region"

Discussants: Keiko Ito and Mahani Zainal-Abidin

Dee, Hanslow, and **Phamduc** analyze the liberalization of trade in services in order to assess the extent to which the traditional Stolper-Samuelson and Rybczynski results in the Heckscher-Ohlin framework are still relevant. In the process, they examine whether and how the benefits of such liberalization are passed on to other sectors in the economy. In that way, the authors open up the "black box" of trade in services in general equilibrium, and explore the implications for different sectors of the economy.

The General Agreement on Trade in Services (GATS) is credited with having created a more secure environment for such trade. But even though GATS put in place a useful framework for dealing with explicit protection, it has generated neither the negotiating momentum to reduce such protection nor the rules to ensure that protection takes a desirable form. **Mattoo** suggests possible improvements to the GATS in the specific commitments made by countries and the negotiating methodology. In general, the policy instrument should be targeted closely on the policy objective, minimizing by-product distortions.

Snape addresses the policy-objective link for services, with a stronger emphasis on the specification of

objectives than has been apparent in some of the literature. He draws on reports of the Australian Productivity Commission on Broadcasting, Gambling, International Aviation, and Architects to illuminate these issues. The lessons are not surprising: that it is best to use policy structures that are attuned to objectives and to seek generic policies in this context. Policies attuned to particular trade, investment, social and cultural, and competition objectives should extend beyond specific industries and beyond specific forms of production, consumption, and trading. In that regard, international trade policies are not used appropriately to improve labor standards, or the environment. Countries' domestic policies should align objectives and policies consistently and efficiently.

Chen, Chou, Kuo, and **Wang** first employ Hoekman's method to estimate the barriers to the services trade in Taiwan. They then apply a multiregional and computable general equilibrium model to analyze the impacts of global trade liberalization in services as well as in commodities. They also consider the technology spillovers from developed countries to developing countries via imports of intermediate inputs, capital goods, and services. Finally, they investigate the effects resulting from the accession of Taiwan and Mainland China to the World Trade Organization (WTO).

In recent decades, there has been a considerable increase in Taiwan's foreign trade in services, and as the Taiwanese economy continues to expand — along with Taiwan's accession into the WTO and full implementation of its liberalization policy — this trend is expected to continue. **Hsueh, Lin,** and **Wang** use trade data from national income accounts, input/output tables, and the balance of payments to examine Taiwan's past trade in services, to analyze some of the determinants involved, and to discuss the potential for future trade in services.

Kim and **Kim** investigate the impact of services liberalization on productivity in Korea. Because Korea underwent active liberalization of the service sector in the 1990s, the authors ask whether the service subsectors that were liberalized, and the manufacturing subsectors that use liberalized services as inputs, experienced productivity gains during this period. Although it is premature to suggest that services liberalization has caused an increase in productivity in Korea, Kim and Kim do find evidence of enhanced competition, for example, in distribution services, which may eventually lead to an increase in productivity.

Lee and **Lie** analyze the evolution of telecommunications regulation and reform in the 1990s in Korea in terms of both its effects on users and industry structure and how the WTO and other pressures for reform affected it. It seems that telecommunications reform has progressed significantly in Korea: prior to the 1990s, the chief objective of policy was the provision of universal service; in the past decade, the objective has been to bring more competition and cost-effectiveness into the system.

Hwang, Shin, and **Yoo** analyze Korea's liberalization of its financial services trade, contrasting the lukewarm approach to liberalization that characterized the early 1990s with the much more enthusiastic approach that occurred after the Asian crisis. Foreign banks play a disciplinary role through monitoring and credit assessment of the borrowers, a function that had not been performed by domestic banks and that would have greatly improved the economy's efficiency. The authors find little evidence of such a disciplinary role by the foreign banks before the crisis when there was government-provided implicit insurance. It is too early to provide a full assessment of the effects of post-crisis liberalization, but the basic functions embodied in financial services are likely to improve after the crisis, because post-crisis policy reform is expected to reduce the implicit insurance drastically.

Fukao and **Ito** estimate the sales and employment of Japanese affiliates of foreign firms (JAFFs) and foreign affiliates of Japanese firms (FAJFs) in the service sector at the three-digit industry level for 1995. They find that imbalances between activities of JAFFs and FAJFs are smaller than those reported in the Ministry of Finance statistics on foreign direct investment (FDI). In terms of employment, the JAFFs/FAJFs ratio is 0.23. Fukao and Ito then compare Japan's purchases of services from foreigners with U.S. purchases from foreigners. For the service sector as a whole, Japan's ratio of imports to total domestic output is 2.1 percent, which is almost identical to the corresponding U.S. ratio of 2 percent. But Japan's ratio of purchases from affiliates to total domestic output is 1.3 percent, less than one-third the corresponding U.S. ratio of 4.1 percent. Japan's market for services seems to be more closed for establishment transactions than for cross-border transactions. Also, compared to the United States, Japan's purchases from foreigners are concentrated in a limited number of industries. Using cross-industry data, Fukao and Ito find that Japanese inward FDI penetration is related closely to the market structure of industries: it is relatively high in industries that have a higher entry rate, a higher sales concentration, and a lower presence of "keiretsu."

Accounting services are an area with particularly strong domestic regulatory arrangements. Business accounting systems are based on country-specific legal frameworks and often are not open to foreign firms or individuals. That works as an unintentional barrier to foreign penetration. At the same time, globalization of economic activities seems to call for the convergence of account-

ing systems. The International Accounting Standards committee has been constructing international accounting standards; in Japan, drastic institutional changes are taking place in accounting in response to these pressures. **Kimura** reviews the transition of the Japanese accounting system and considers how market forces are affecting the relationship between domestic institutions and international policy discipline.

Urata and **Kiyota** examine service trade in East Asia from two different perspectives: service trade in the form of cross-border supply and consumption abroad, and service trade that is embodied in goods trade. They confirm that service trade in East Asia has been increasing in recent decades. They also find that, unlike goods trade, service trade in many East Asian economies was in deficit. However, many East Asian economies engaged heavily in service trade in transportation, travel, and other services.The authors confirm that the Heckscher-Ohlin model can explain the patterns of trade in certain services — including computer and information services — but not more generally. Further, they show that a large amount of services are "traded" via goods trade. Indeed, for many countries the overall balance in service trade turns out to be a surplus, because the trade surplus in embodied service trade is greater than the trade deficit in disembodied service trade.

Wong and **Zhang** report the results of a survey of Hong Kong firms with regard to their experience in providing services to other Asian countries. Hong Kong is an important trade services hub in the Asia–Pacific region. Further services liberalization in other countries will provide increased opportunities for Hong Kong service exports, but also may allow service providers in other countries to compete increasingly with Hong Kong. It is not clear whether these changes ultimately will weaken or strengthen Hong Kong's competitive position vis-à-vis the service providers based in other Asian countries.

Wang and **Wu** investigate and identify the factors that determine the relative competitiveness of international tourism among a group of seven East Asian economies. Using data on U.S. and Japanese visitors, they find that: 1) international tourists are not sensitive to relative price variations if the purposes of their visit are business or visiting relatives, and/or if they come to the destinations on packaged group tours; 2) foreign visitors are not sensitive to variations in exchange rates if most of the tourism expenditures in these destinations are priced in terms of their home currencies; and 3) qualitative supply-side factors indeed may influence market share. Nevertheless, these effects depend on place of origin and destination.

These papers and their discussions will be published by the University of Chicago Press in an NBER Conference Volume. In advance of publication, most of these papers will be available on the NBER's Web site, **www.nber.org**.

Indonesia

The fifth in a series of country-specific meetings of the NBER Project on Economic and Financial Crises in Emerging Market Countries, directed by NBER President Martin Feldstein and Research Associate Jeffrey A. Frankel, both of Harvard University, took place in Cambridge on September 15. This gathering focused on Indonesia and was organized by Simon Johnson of MIT and Steven Radelet of the U.S. Department of Treasury. Like earlier NBER meetings on Mexico, Thailand, Brazil, and Korea, this occasion brought together academics, individuals representing the country, international bankers, and government officials in the hopes of developing an in-depth understanding of Indonesia's economic situation.

The day-long meeting was divided into four sessions. In Session 1, a panel consisting of Iwan Azis, Cornell University, Joseph Stern, Harvard University, Swati Ghosh, the World Bank, and Rino Effendi, Danareksa, discussed liberalization and growth in Indonesia prior to 1997. They asked, for example: What were the origins of the Indonesian economic crisis? Was Indonesia's macroeconomic policy before 1997 appropriate? Also, did Indonesia undertake international financial liberalization too soon — that is, before trade or domestic financial liberalization, or strengthening regulations? And, was banking supervision a problem before the crisis?

In Session 2, the experts discussed Indonesian macroeconomic policy in the fall of 1997. The panelists were: J. Soedradjad Djiwandono, formerly of the Bank of Indonesia; Steven Radelet; David Lipton, Moore Capital Strategy Group; and Josh Felman, IMF. This group focused on the following questions: How appropriate was the initial macroeconomic response? Was the Indonesian rupiah initially overvalued? After the Thai crisis of July 1997, why did Indonesia widen its currency bands but still suffer a severe depreciation? And what does this say about the new conventional wisdom that narrow bands are unsustainable? Further, what was the IMF's role? Did it cause or exacerbate the crisis? Was its program well designed?

In Session 3, panelists Bambang

Subianto, formerly the Indonesian Minister of Finance, Ernest Stern, JP Morgan, Lloyd Kenward, formerly of the World Bank, and Yung Chul Park, Korea University, considered the role of banking and the broader issues of institutions roles during crises. They asked such questions as: Was it appropriate to close banks in the fall of 1997? Did the IMF act appropriately in this regard? When did corporate governance problems become evident, and what could have been done to mitigate their effect? And, to what extent do institutional weaknesses explain the Indonesian crisis?

In the fourth session, Anwar Nasution, Governor of Bank Indonesia, Dennis Flannery, Lehman Brothers, Anoop Singh, IMF, and Andrew Berg, U.S. Department of Treasury, discussed attempts to recover. They asked: Why has economic recovery been slower in Indonesia than in other Asian countries? Could economic policy in 1998-2000 been designed and implemented better? And, has the crisis destabilized Indonesia in a long-lasting way, or forced needed reforms?

In addition to these sessions, there was an off-the-record after dinner presentation by Rudiger Dornbusch, NBER and MIT. A summary of the other meetings appears on the NBER's web site at **http://www.nber.org/crisis/**. A summary of this meeting will also be provided at that site.

Scanner Data and Price Indexes

The topic of the most recent NBER Conference on Research in Income and Wealth, which took place in Arlington, Virginia, on September 15–16, was "Scanner Data and Price Indexes." Robert C. Feenstra, NBER and University of California, Davis, and Matthew D. Shapiro, NBER and University of Michigan, organized this program:

Session1: Ongoing Projects at Statistical Agencies

David H. Richardson, Bureau of Labor Statistics (BLS), "Scanner Indexes for the CPI"

David Fenwick and **Adrian Ball,** U.K. Office for National Statistics, "Price Collection and Quantity Assurance of Item Sampling in the Consumer Price Index: How Can Scanner Data Help?"

Robin Lowe and **Candace Ruscher,** Statistics Canada, "Estimating Price Movements for Consumer Durables Using Electronic Retail Transactions Data: An Empirical Study Using Televisions"

Session 2: Price Variation over Time

Judith A. Chevalier and **Anil K. Kashyap**, NBER and University of Chicago, and **Peter E. Rossi,** University of Chicago, "Why Don't Prices Rise during Peak Demand Periods? Evidence from Scanner Data" (NBER Working Paper No. 7981)

Discussant: David Reiffen, Federal Trade Commisson

Matthew D. Shapiro and **Robert C. Feenstra**, "High Frequency Substitution and the Measurement of Price Indexes"

Discussant: Marshall Reinsdorf, Bureau of Economic Analysis

Robert B. Barsky, NBER and University of Michigan, **Mark E. Bergen,** University of Minnesota, **Shantanu Dutta,** University of Southern California, and **Daniel Levy,** Bar-Ilan University, "What Can the Price Gap between Branded and Generic Tell Us about Markups?"

Discussant: Julio J. Rotemberg, NBER and Harvard University

Session 3: Index Measurement with New Product Varieties

Amil K. Petrin, University of Chicago, and **Austan D. Goolsbee,** NBER and University of Chicago, "Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV"

Discussant: Steven T. Berry, NBER and Yale University

Ernst R. Berndt, NBER and MIT, **Davina Ling,** MedStat, **Margaret K. Kyle,** and **Stan N. Finkelstein,** MIT, "The Long Shadow of Patent Expiration: Do Rx to OTC Switches Provide an Afterlife?"

Discussant: Steve Morgan, University of British Columbia

Ralph Bradley, BLS, "Price Index Estimation under Binding Constraints—Evidence from New York Cereal Scanner Data"

Discussant: Eduardo Ley, International Monetary Fund

Session 4: Index Measurement with Quality Change

Aviv Nevo, NBER and University of California, Berkeley, "New Products, Quality Changes, and Welfare Measures Computed from Estimated Demand Systems"

Discussant: C. Lanier Benkard, NBER and Stanford University

Mick Silver and **Saeed M. Heravi**, Cardiff University, "The Measurement of Quality-Adjusted Price Changes"

Discussant: W. Erwin Diewert, NBER and University of British Columbia

William J. Hawkes and **Frank W. Piotrowski,** ACNielsen, "Using Scanner Data to Improve the Quality of Measurement and the Measurement of Quality in the Consumer Price Index"

Discussant: Jack Triplett, Brookings Institution

(Cont'd on next pg.)

The Consumer Price Index (CPI) is the nation's primary measure of the price change in consumer goods and services. To produce the CPI, BLS staff observe prices in stores and other retail outlets, thus tracking the prices of samples of items in the various categories of consumer spending. In some of those categories, all or virtually all of the items have a manufacturer-supplied identifier, known as a Universal Product Code (UPC). Manufacturers print UPCs on their products in bar code format so that computer scanners can read them easily. Retailers assign prices by UPC for scanning at the checkout and to manage their inventories. Consequently, the retailers have computerized records of the prices and number of units they sell; these records are commonly called scanner data. **Richardson** explores the ways that the BLS can use scanner data in place of price data to calculate the CPI. Specifically, his paper is a progress report on a major CPI program initiative to construct scanner-based test indexes for breakfast cereal in the New York metropolitan area.

The monthly Retail Price Index is the main domestic measure of consumer inflation in the United Kingdom and is one of the highest profile outputs produced by the Office for National Statistics. The quality of the index depends significantly on how representative is the sample of retail outlets used to monitor prices and the choice of items for which prices are collected. **Fenwick** and **Ball** look at the scope for enhancing the quality of the index by using scanner data as a benchmark for checking the representative nature of the achieved sample. They then consider, in the context of traditional data collection methods, possible actions to improve the index by exploiting of information available from scanner data.

Lowe and **Ruscher** compare two different approaches — the current practice at Statistics Canada and variants using scanner data — for calculating price indexes for televisions. The authors examine the process of evaluating quality change for televisions over the past nine years and identify the main issues for improvement. They also look at the results based on using scanner data from 1997–9. None of the ways of handling the data seems entirely satisfactory to the authors without additional detailed examination of the micro data. Thus, they conclude that a practical use of scanner data will involve using only part of it.

Chevalier, Kashyap, and **Rossi** examine the retail and wholesale prices of a large supermarket chain in Chicago over a seven and a half year period. They show that prices tend to fall during the seasonal peak in demand for a product and that changes in retail margins explain some of those price changes. Thus, their results add to the growing body of evidence that markups are countercyclical. Manufacturer behavior plays a more limited role in the countercyclical nature of prices.

Shapiro and **Feenstra** examine high frequency (weekly) data on canned tuna to determine whether this can be used to construct meaningful price indexes. The authors construct two different types of weekly price indexes. The first — a *fixed-base* index — compares each week in 1993 to the modal price in 1992, using as weights the average 1992 sales at the modal price. This fixed-based Laspeyres index corresponds to that traditionally used in the CPI. The second type of index, a *chained* formula, updates the weights continuously and cumulates period-by-period changes in the price indexes to get long-term changes. Shapiro and Feenstra find that the difference between these two indexes is large: the chained Törnqvist has a pronounced upward bias for some regions of the United States. One explanation for this pattern is that consumers are purchasing goods for inventory accumulation. The authors therefore investigate the extent to which the weekly purchases of tuna are consistent with inventory behavior and find some statistical support for this hypothesis.

Barsky, Bergen, Dutta, and **Levy** investigate the size of markups for nationally branded products sold in the U.S. retail grocery industry. They treat the price of the comparable private label product as an upper bound for the marginal costs faced by the branded manufacturer. Using scanner data from a large midwestern grocery chain, they estimate the markup ratios for over 200 products in 19 categories. This data includes not only the prices and quantities sold by UPC, but also the retailers' margins on each product, allowing the authors to measure the markup ratios for national brands based on wholesale prices. The authors find that markup ratios measured this way range from 2.5 for crackers and 2.3 for analgesics to 1.2 for canned tuna; the majority of markups range from 1.4 to 1.7. The authors also find that retailers' markups are generally lower for nationally branded products than for private labels. The net effect is that markup ratios measured using only retail price data will understate the markups for nationally branded products.

Petrin and **Goolsbee** examine the welfare gains attributable to the introduction of Direct Broadcast Satellite, the alternative to cable television. Using micro data on the television viewing habits of 35,000 people and the prices and characteristics of cable companies throughout the nation, they explore the efficiency gains from using consumer-level relative to market-level data as well as the gains

from observing data on utilization. Their results suggest that the introduction of home satellites created a significant amount of consumer surplus to those who adopted the technology. At current prices, the own-price elasticity of satellites is well above one, as is the cross-price elasticity of satellites with respect to the price of cable. Interestingly, the estimated price elasticity for cable is significantly less than one, suggesting that the threat of regulation may have kept prices below what cable companies would charge in an unregulated market.

Within the next few years, a number of the best-selling U.S. prescription pharmaceuticals — Prilosec, Prozac, Pepcid, and Claritin, for example — are likely to face patent expiration. Will only switches from prescription drug to nonprescription over-the-counter (Rx to OTC) occur? If so, what will be their effects on prices and utilization? And does the Rx to OTC switch significantly mitigate the effects of Rx patent expiration? To answer such questions, **Berndt, Ling, Kyle,** and **Finkelstein** focus on three main sets of policy instruments: 1) pricing and marketing strategies by branded pioneer drug manufacturers on their Rx drugs pre- and post-patent expiration, including both traditional physician-oriented marketing and direct-to-consumer marketing; 2) the impact of generic entry on the price, utilization, and revenues of the molecule post-patent expiration; and 3) the effects of Rx to OTC switches on cannibalization of same-brand Rx sales, and on total brand sales.

When constructing a price index that truly measures the cost of living, one needs to account for the welfare effects of the changing product mix over time. Many past studies ignored this issue and computed indexes using a unit-value approach. In this paper, **Bradley** establishes a method for generating a price index that accounts for the welfare effects of product exit and entry. He applies this method to cereal purchases in New York and compares it to the unit value method. As applied to cereal, Bradley's index is most often below the index generated with unit values.

The CPI Commission found that the current CPI overstates the cost of living by about 1.1 percentage points and its report pointed to improper treatment of new products and quality changes as major causes of this bias. **Nevo** considers the construction of an alternative price index based on an estimated demand system. In principle, this method could produce a price index that accounts for introduction of new products and for quality changes in existing products. Then, using estimates of a brand-level demand system for ready-to-eat cereal, Nevo calculates that, depending on the interpretation of the demand estimates, his price index can range from a 35 percent increase over the five years examined to a 0.6 percent decrease.

Silver and **Heravi** consider three approaches to estimating quality-adjusted price changes based on scanner data: the dummy variable approach from a hedonic regression; a superlative or exact hedonic index (SEHI) approach; and a matching technique. The dummy variable approach has been used to provide independent estimates of quality changes. However, the availability of scanner data provides an opportunity to use data on the prices (unit values), volumes, and quality characteristics of a much wider range of transactions, and to consider less restrictive methods than the dummy variable approach. The authors also consider the practical compilation of CPIs when quality adjustment is necessary to insure that quality differences do not mar the price comparison of the new variety with the old variety of products.

Hawkes and **Piotrowski** claim that the shift to the more accurate scanner data in marketing research offers opportunities for significant quality improvements in official price index construction — for comparing prices across both time and countries. In addition to improving the quality of measurement, these data provide an opportunity for the use of hedonic analysis of detailed product characteristics. The authors discuss these improvements and present year-to-year price index trends for an entire CPI "item stratum" using scanner data. They conclude with a discussion of data aggregation issues in CPI construction.

These papers and their discussions will be published by the University of Chicago Press in an NBER Conference Volume.

Tax Policy and the Economy

The NBER's fifteenth Annual Conference on Tax Policy and Economy was held in Washington, D.C., on October 3. James M. Poterba, Director of the NBER's Public Economics Program, also of MIT, organized this program:

Mihir A. Desai, NBER and Harvard University, and **James R. Hines, Jr.**, NBER and University of Michigan, "The Uneasy Marriage of Export Subsidies and the Income Tax"

Robert Carroll, Department of the Treasury, **Douglas Holtz-Eakin**, NBER and Syracuse University, **Mark Rider**, Kennesaw State University, and **Harvey S. Rosen**, NBER and Princeton University, "Personal Income Taxes and the Growth of Small Firms" (NBER Working Paper No. 7980)

Andrew W. Mitrusi, NBER, and **James M. Poterba**, "The Changing Importance of Income and Payroll Taxes on U.S. Families"

David T. Ellwood and **Jeffrey B. Liebman**, NBER and Harvard University, "The Middle Class Parent Penalty: Child Benefits in the U.S. Tax Code"

Martin Feldstein, NBER and Harvard University, and **Elena Ranguelova**, Harvard University, "Accumulated Pension Collars: A Market Approach to Reducing the Risk of Investment-Based Social Security Reform" (NBER Working Paper No. 7861)

Mark B. McClellan, NBER and Stanford University, "Medicare and the Federal Budget: Past Experience, Current Policy, Future Prospects"

Desai and **Hines** investigate the economic impact of tax subsidies to American exporters, including a partial tax exemption for export profits (available by routing exports through Foreign Sales Corporations) and the allocation of export profits to foreign source income for the purposes of U.S. taxation. The authors identify three important economic features of these tax provisions. First, the official figures appear to understate the tax expenditures associated with some U.S. export incentives by at least 65 percent. Second, the 1984 regime shift in export subsidies was contemporaneous with a significant change in the pattern of U.S. exports. The changes introduced in 1984 reduced manufacturing exports by an estimated 3.1 percent. Third, there were significant market reactions to the European Union's 1997 charge that U.S. export subsidies were inconsistent with World Trade Organization rules. The filing of the European complaint coincided with a 0.1 percent fall in the value of the U.S. dollar and steep drops in the share prices of large American exporters.

Carroll, Holtz-Eakin, Rider, and **Rosen** analyze the personal income tax returns of a large number of sole proprietors before and after the Tax Reform Act of 1986 in order to determine how the substantial reductions in marginal tax rates associated with that law affected the growth of their firms as measured by gross receipts. The authors find that individual income taxes exert a statistically and quantitatively significant influence on firm growth rates. Raising the sole proprietor's tax price (one minus the marginal tax rate) by 10 percent increases receipts by about 8.4 percent. This is consistent with the view that raising income tax rates discourages the growth of small businesses.

Nearly two-thirds of U.S. families currently pay more in payroll taxes than they pay in federal personal income taxes. At the bottom of the family income distribution, payroll taxes exceed income taxes for nearly 90 percent of families. **Mitrusi** and **Poterba** document the relative magnitude of income and payroll tax burdens on different types of families, including married couples, single individuals, and single-parent families. They conclude that the percentage of families for whom the marginal payroll tax rate exceeds the marginal personal income tax rate is much lower when the payroll tax rate is viewed net of the present discounted value of future Social Security benefits than when the statutory payroll tax rate alone is considered.

Low-income families with children receive large tax benefits from the Earned Income Tax Credit, while high-income taxpayers receive large tax benefits from dependent exemptions (of greatest value to those in high tax brackets). Middle-income parents, in contrast, receive substantially smaller tax benefits associated with children. This U-shaped pattern of benefits by income, which **Ellwood** and **Liebman** call the "middle-class parent penalty," not only raises issues of fairness, it also generates high or higher marginal tax rates and marriage penalties for moderate income families than for more well-to-do taxpayers. The authors examine five options for reducing or eliminating the middle-class parent penalty, and the high marginal tax rates and marriage penalties it produces.

Feldstein and **Ranguelova** show how a new type of derivative prod-

uct that could be supplied by private financial markets might be used to guarantee that an investment-based Social Security reform provides at least the level of real retirement income that is projected in current Social Security rules. In effect, future retirees could purchase a "put option" that guarantees that future retirement benefits will not fall below the level projected in current Social Security law or some other chosen level. To pay for this guarantee, future retirees would agree to give up the part of the annuity payments that exceed a given level, effectively selling a "call option" on the stream of payments. This market-based approach could be completely voluntary, leaving individuals to decide what level of guarantee they want. The higher the minimum guarantee that individuals choose, the more of the potentially higher returns they must give up. The financial market thus can tailor individuals' products to their risk preferences. The authors show that it is feasible to protect future benefits equal to those projected in current law with a combination of the current payroll tax rate and Personal Retirement Account savings equal to 2.5 percent of covered earnings.

McClellan presents a primer on Medicare budgeting and uses this framework to discuss the accounting and real effects of recent proposed reforms in Medicare financing. He reviews Medicare's current financing system, describes the budgetary history of the program, and discusses the very challenging problem of uncertainty in budgetary forecasts attributable to having to estimate future population demographics, population health, and the intensity of medical care for future Medicare. His alternative forecasts of Medicare spending allow for higher trends in the intensity of medical treatment, which seem plausible given Medicare's historical record and continuing rapid technological innovation in care for the elderly. These forecasts suggest quite different budgetary implications from official forecasts. Finally, McClellan discusses the possible short- and long-term budgetary effects of a range of "accounting" and "real" reforms in the Medicare program.

These papers will be published by the MIT Press as *Tax Policy and the Economy*, Volume 15. The volume will be available in the spring. The conference versions of the papers are available at "Books in Progress" on the NBER's web site, **www.nber.org**.

Bureau News

NBER Researchers Share Nobel Prize in Economics

NBER Research Associates James J. Heckman of the University of Chicago and Daniel L. McFadden of the University of California, Berkeley, will share the 2000 Nobel Prize in Economics.

Heckman, who has been affiliated with the NBER since 1987 and is a member of the Programs in Labor Studies, Public Economics, and Children, was awarded the prize for his pioneering work in accounting for unknown factors affecting statistical samples. Much of his work has been applied to understanding how early life events contribute to individuals' later earnings potential and economic status.

McFadden, who has been affiliated with the NBER since 1985 and is a member of the Program on Aging, was cited for his work on a new theory of "discrete choice" — a way to measure how an individual's decisions about occupation or housing, for instance, reflect choices among a limited number of alternatives.

These two now join a long list of NBER researchers who have received the Prize, including: Robert C. Merton and Myron S. Scholes, 1997; Robert E. Lucas, Jr., 1995; and Robert W. Fogel, 1993. Other NBER researchers who have won the Nobel Prize in Economics are Simon S. Kuznets, Milton Friedman, Theodore W. Schultz, George J. Stigler, and Gary S. Becker

NBER Announces Nonprofit Fellowships

The NBER has just announced that it will award dissertation fellowships on "The Economics of the Nonprofit Sector" to four graduate students for the coming academic year: Jason Brown, Stanford University, whose topic is "Behavior of For-Profit and Not-for Profit Firms Under Medicare"; Pedro Carneiro, University of Chicago, who is studying the "Determinants of and Consequences of Public and Private Schooling in Chile"; Mehdi Farsi, University of Southern California, for "Changes in Hospital Quality After Conversion from Non-Profit to For-Profit Status"; and Jonathan Zinman, MIT, for "Nonprofit Organizations and the Community Redevelopment Act." This is the third year of an NBER program designed to encourage research on nonprofit institutions by NBER Research Associates and Faculty Research Fellows, and to support dissertation research on the same subject by graduate students in economics who work closely with them.

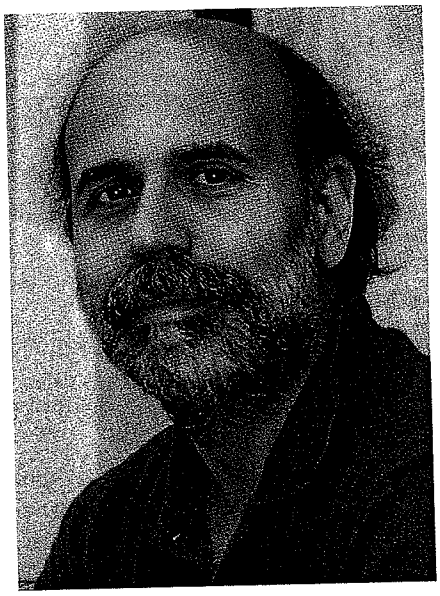
Faculty grants were made to: Dora Costa, MIT, who will study "Bowling Alone Reconsidered — Women's Labor Supply and Participation in Nonprofit Organizations"; Susan Dynarski, Harvard University, who will focus on "Tuition Tax Credits and Price Setting in the Higher Education Market"; William Goetzmann and Sharon Oster, Yale University, whose research is on "Valuation Issues in the Economics of Art Museums"; and Frank Wolak, Stanford University, who will analyze "Organizational Form Choice for Market and System Operators in Competitive Electricity Markets."

New Directors Elected

The NBER's Board of Directors elected two new members at its annual meeting in September: Angelo Melino, representing the Canadian Economic Association, and Alicia H. Munnell, Director-at-Large. Melino is a professor of economics at the University of Toronto; Munnell is the Peter F. Drucker Professor in Management Sciences at the Carroll School of Management, Boston College.

Full profiles of the new directors appear in this issue of the *NBER Reporter*.

Bernanke to Head Monetary Economics Program



NBER Research Associate Ben S. Bernanke will succeed N. Gregory Mankiw as Director of the NBER's Program on Monetary Economics. Mankiw is retiring as Program Director, having served since 1991, but will continue as a member of the Program.

Bernanke is the Howard Harrison and Gabrielle Snyder Beck Professor of Economics and Public Affairs and the chair of the economics department at Princeton University. A macroeconomist, his research has focused on monetary policy and macroeconomic history. His most recent book is on inflation targeting, a new strategy for the practice of monetary policy. With the support of a Guggenheim Fellowship, he is currently writing a book on the Great Depression. He is also the author of a best-selling textbook in macroeconomics.

Bernanke received his B.A. from Harvard and his Ph.D. from MIT. He has taught at Stanford Graduate School of Business, MIT, and New York University, as well as at Princeton. He has consulted for the Federal Reserve Board of Governors, the European Central Bank, and other central banks, and he serves on a U.S. State Department committee that advises the Israeli government on economic policy. Bernanke is a Fellow of the Econometric Society and has served as the co-editor of the NBER Macroeconomics Annual since 1995.

Twenty-First NBER Summer Institute Held in 2000

In the summer of 2000, the NBER held its twenty-first annual Summer Institute. Nearly 1000 economists from universities and organizations throughout the world attended. As in prior years, this year's program was funded primarily by a grant from the Lynde and Harry Bradley Foundation, with additional support from the National Science Foundation and the National Institute on Aging.

The papers presented at dozens of different sessions during the four-week Summer Institute covered a wide variety of topics. A complete agenda, and many of the papers presented at the various sessions, is available on the NBER's web site at **www.nber.org**.

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First Summer Institute Session of Inter-American Seminar on Economics

As part of the NBER's Summer Institute, participants in the NBER's Inter-American Seminar on Economics (IASE) met in Cambridge on July 22. The IASE brings together economists from Latin American countries and from the United States. This program, begun in 1987, now meets three times a year, alternating between Latin America and Cambridge. This summer's meeting brought together more than 25 economists. IASE organizer Sebastian Edwards, NBER and University of California, Los Angeles, chaired the program, at which the following papers were discussed:

James E. Rauch, NBER and University of California, San Diego, and **Vitor Trindade,** University of California, San Diego, "Information and Globalization: Wage Co-Movements, Labor Demand Elasticity, and Conventional Trade Liberalization" (NBER Working Paper No. 7671)

Pablo Sanguinetti and **Sebastian Galiani,** Universidad Torcuato di Tella, Argentina, "Wage Inequality and Trade Liberalization: Evidence from Argentina"

Matthew J. Slaughter, NBER and Dartmouth College, "Trade and Labor Market Outcomes: What about Developing Countries?"

David Dollar and **Aart Kraay,** The World Bank, "Growth Is Good for the Poor"

Jere R. Behrman, University of Pennsylvania; **Nancy Birdsall,** Carnegie Endowment for International Peace; and **Miguel Székely,** Inter-American Development Bank, "Economic Reform and Wage Differentials in Latin America"

Harald Beyer, Centro de Estudios Publicos, Chile, "Returns to Education and Wage Inequality: Evidence from Chile"

Gerardo Esquivel and **José Antonio Rodríguez-López,** El Colegio de Mexico, "NAFTA and Its Impact on Mexico's Labor Markets"

Rauch and **Trindade** model the home country's familiarity with business opportunities in a foreign country as a parameter in a matching process between domestic and foreign firms. They show that as familiarity increases: the effect of relative national labor supplies on relative national wages declines; the elasticity of domestic labor demand increases; and the extent of "pass-through" of trade tax changes to home wages increases. Since the volume of trade is increasing in familiarity, trade liberalization has a greater impact on wages when the initial volume of trade is greater, all else being equal. As familiarity becomes complete, the results of the 2 x 2 Heckscher-Ohlin-Samuelson model are obtained. Relative national wages are fixed by trade taxes independent of relative national labor supplies; domestic labor demand is infinitely elastic; and pass-through of tax changes to wages is "complete" in the sense that it is determined entirely by production technology and no arbitrage opportunities remain.

Sanguinetti and **Galiani** study the relationship between trade liberalization and relative wages in Argentina. They define skilled labor in terms of precise educational categories, and they control for a number of individual characteristics — sex, age, and work experience — that also affect wages. The authors find that trade flows, industrial employment, and relative prices all move following trade liberalization according to what a simple version of the Heckscher-Ohlin model would have predicted for an economy such as Argentina's. Also, trade liberalization appears to increase the college wage premium. Still, similar to what has been found for some developed economies, a deepening of trade can only explain a small portion of the observed rise in wage inequality.

Slaughter addresses the labor-market impacts of trade and foreign direct investment (FDI) liberalization in developing countries. His central message is that many developing countries recently have seen income inequality rise, not fall, after a liberalization of trade and FDI. These increases in inequality contradict the benchmark Heckscher-Ohlin intuition commonly applied to developing-country liberalization. Thus, developing-country policymakers should not regard liberalization as a sure-fire poverty-reduction program. Of course, it is possible that rising inequality can co-exist with declines in absolute poverty.

The income of the bottom fifth of the population rises one-for-one with

overall growth in per capita GDP in a sample of 80 countries over four decades. The effect of growth on the income of the poor is no different in poor countries than in rich ones, nor do incomes of the poor fall more than proportionately during economic crises. Further, the poverty-growth relationship has not changed in recent years. **Dollar** and **Kraay** show that policy-induced growth still is as good for the poor as for the overall economy; openness to foreign trade, good rule-of-law, and fiscal discipline all benefit the poor to the same extent that they benefit the whole economy. Avoidance of high inflation is particularly good for the poor: that is, high inflation is more harmful to the income of the poor than to GDP overall. In contrast, Dollar and Kraay find no evidence that formal democratic institutions, or public spending on health and education, have systematic effects on incomes of the poor.

Behrman, Birdsall, and **Székely** develop and apply a new approach to the estimation of the impact of economy-wide reforms on wage differentials. They use a new high-quality dataset on wage differentials by schooling level for 18 Latin American countries for the period 1980–98. Their results indicate that reform overall has had a short-run disequalizing effect on expanding wage differentials, although this effect tends to fade away over time. This disequalizing effect is attributable to the strong impact of domestic financial market reform, capital account liberalization, and tax reform. On the other hand, privatization has contributed to narrowing wage differentials, and trade openness has had no effect on wage differentials. Technological progress, not trade flows, appears to be one channel through which reforms are affecting inequality. The authors also explore the effects of reforms on wage levels. Their tentative results suggest that reforms have had a positive effect on real average wages, but a negative effect on the wages of less-educated workers.

Beyer tries to build a better picture of the evolution of wage inequality in Chile, using a technique originally developed by Juhn et al. (1993) to decompose the changes in the wage distribution data. He finds that these changes to a great extent are attributable to changes in observable prices. On the other hand, these changes are explained mainly by changes in the return to education, specifically increases in the private return to university education and a decline in the returns to primary and secondary education.

Esquivel and **Rodríguez-López** review the effect of the North American Free Trade Agreement on Mexico's labor markets. Unlike most of the literature, their research focuses on the level and composition of employment in the 1990s rather than on wage differentials or wage inequality patterns. The authors argue that this change of perspective helps to shed light on the true effect of trade policies on labor markets, while avoiding the identification problems associated with studies that focus only on wage trends. They provide empirical evidence that Mexico's labor market had a period of job-destruction (following the unilateral trade liberalization of the mid-1980s) and then a period of job-creation (following NAFTA's implementation). The authors then claim that this pattern is exactly what would have been predicted by a standard model of trade liberalization and the labor market.

Economic Fluctuations and Growth

The summer research meeting of the NBER's Program on Economic Fluctuations and Growth took place in Cambridge on July 22. Kenneth D. West, NBER and University of Wisconsin, Madison, and Michael Woodford, NBER and Princeton University, organized the program and chose the following papers for discussion:

Pierre-Olivier Gourinchas, NBER and Princeton University, "Precautionary Savings, Life Cycle, and Macroeconomics"
Discussants: Christopher D. Carroll, NBER and Johns Hopkins University, and Jose-Victor Rios-Rull, NBER and University of Pennsylvania

Marvin J. Barth III, Federal Reserve Board of Governors, and **Valerie A. Ramey,** NBER and University of California, San Diego, "The Cost Channel of Monetary Transmission" (NBER Working Paper No. 7675)
Discussants: Christopher A. Sims, NBER and Princeton University, and Mark Gertler, New York University

Paul Beaudry, NBER and University of British Columbia, and **Franck Portier,** Université de Toulouse, "An Exploration into Pigou's Theory of Cycles"
Discussants: Nobuhiro Kiyotaki, London School of Economics, and James D. Hamilton, NBER and University of California, San Diego

Craig Burnside, World Bank, and **Martin Eichenbaum** and **Sergio Rebelo,** NBER and Northwestern University, "On the Fundamentals of Self-Fulfilling Speculative Attacks"
Discussants: Olivier Jeanne, International Monetary Fund, and Paolo Pesenti, Federal Reserve Bank of New York

Stefania Albanesi, Northwestern University; **V. V. Chari,** University of Minnesota; and **Lawrence J. Christiano,** NBER and Northwestern University, "Expectation Traps and Monetary Policy"
Discussants: Peter N. Ireland, NBER and Boston College, and Lars E. O. Svensson, NBER and Institute for International Economic Studies

Stephen Bond, Oxford University, and **Jason G. Cummins,** New York University, "The Stock Market and Investment in the New Economy: Some Tangible Facts and Intangible Fictions"
Discussants: Robert E. Hall, NBER and Stanford University, and Janice C. Eberly, NBER and Northwestern University

Gourinchas explores the implications of precautionary saving and life-cycle behavior for aggregate macroeconomic fluctuations and individual dynamics. Existing heterogeneous agent models of the business cycle, with uncertainty of labor income and incomplete markets, yield aggregate quantitative predictions that are almost identical to those of representative agent models. This quasi-aggregation theorem arises when idiosyncratic shocks are largely transitory. The author revisits these results in the context of an overlapping generations model with two sources of heterogeneity: age and idiosyncratic shocks to labor income. The results indicate that quasi-aggregation still obtains. However, the nature of the equilibrium and of aggregate fluctuations is influenced by the existence of idiosyncratic risk.

Barth and **Ramey** show that the "cost channel" may be an important part of the monetary transmission mechanism. They argue that if working capital is an essential component of production and distribution, then monetary contractions can affect output through a supply channel as well as through the traditional demand-type channels. The authors specify an industry equilibrium model and use it to interpret the results of a vector autoregression analysis. They find that after a monetary contraction, many industries have periods of falling output and rising price-wage ratios, consistent with a supply shock. These effects are found to be noticeably more pronounced during the period before 1979.

Beaudry and **Portier** propose a model of business cycles in which recessions and booms arise as the result of difficulties encountered by agents in properly forecasting the economy's future capital needs. The idea has a long history in macroeconomic literature, as reflected by the work of Pigou (1927). The authors first illustrate the type of general equilibrium structure that can give rise to such phenomena. Then they examine the extent to which such a model can explain the observed pattern of U.S. recessions — frequency and depth — without relying on technological regress. Beaudry and Portier argue that this type of model may help to explain elements of the recent downturns in Asia as well as why recessions appear to be driven by declines in aggregate demand,

even in the absence of any significant price rigidities.

Burnside, Eichenbaum, and **Rebelo** propose a theory of twin banking–currency crises in which both fundamentals and self-fulfilling beliefs play crucial roles. Fundamentals determine whether crises will occur. Self-fulfilling beliefs determine when they occur. The fundamental that causes twin crises is government guarantees to domestic banks' foreign creditors. When these guarantees are in place, twin crises inevitably occur but their timing is a multiple equilibrium phenomenon that depends on agents' beliefs. So, while self-fulfilling beliefs have an important role to play, twin crises do not happen just anywhere. They happen in countries where there are fundamental problems such as guarantees to the financial sector.

Albanesi, Chari, and **Christiano** examine whether standard monetary general equilibrium models with benevolent monetary authorities acting under discretion can explain the persistent episodes of high and low inflation observed in many countries. Specifically, they ask whether private agents' expectations of high or low inflation can lead them to take actions, which then make it optimal for monetary authorities to validate these expectations. Following Chari, Christiano, and Eichenbaum (1998), the authors label such an outcome an expectation trap. They find that expectation traps can occur, even in the absence of trigger strategies. Moreover, they demonstrate this possibility in a model that has some hope of being able to account for key features of inflation dynamics.

Bond and **Cummins** consider whether the increase in the stock market reflects the growing role of intangible capital in generating profits (that is, the birth of the New Economy) or a persistent and broadly based increase in the market valuation of companies relative to their fundamental value. The authors introduce a new approach based on the Q model of investment that is rich enough to encompass both these possibilities. They then study investment behavior, in both tangible and intangible capital, and assess whether it is consistent with one or both explanations. Although Bond and Cummins can identify a limited role for intangible investment, they find no evidence that it accounts for the spectacular rise in the stock market valuation of firms. Their results suggest that persistent deviations of equity values from firms' fundamental valuations are an important feature of U.S. stock markets over the past 17 years, and that this can account for the weak observed relationship between share prices and investment.

Japan Project

Members and guests of the NBER's Japan Project met in Tokyo on September 22 and 23. Magnus Blomstrom, NBER and Stockholm School of Economics; Jennifer Corbett, Oxford University; Fumio Hayashi, NBER and University of Tokyo; and Anil K Kashyap, NBER and University of Chicago, organized the following program:

Christopher D. Carroll, NBER and Johns Hopkins University, "'Risky Habits' and the Marginal Propensity to Consume Out of Permanent Income; or How Much Would a Permanent Tax Cut Boost Japanese Consumption?" (NBER Working Paper No. 7839)
Discussants: Toshihiro Ihori, University of Tokyo, and Adam S. Posen, Institute for International Economics

R. Anton Braun, International University of Japan, and **Etsuro Shioji,** Yokohama National University, "Monetary Policy and the Term Structure of Interest Rates in Japan"
Discussants: Naohiko Baba, Bank of Japan, and Eric Girardin, Université de la Mediterranée

Ramana Ramaswamy and **Hossein Samiei,** International Monetary Fund, "The Yen-Dollar Rate: Have Interventions Mattered?"
Discussants: Michael R. Darby, NBER and University of California, Los Angeles, and Kenichi Ohno, National Graduate Institute for Policy Studies

Michael W. Klein, NBER and Tufts University, **Joe Peek,** University of Kentucky, and **Eric S. Rosengren,** Federal Reserve Bank of Boston, "Troubled Banks, Impaired Foreign Direct Investment: The Role of Relative Access to Credit" (NBER Working Paper No. 7845)
Discussants: Akiko Tamura, Hosei University, and David E. Weinstein, NBER and Columbia University

Ulrike Schaede, University of California, San Diego, "Self-Regulation and the Sanctuary Strategy: Competitive Advantage through Cooperation by Japanese Firms"
Discussants: Motoshige Itoh, University of Tokyo, and Gary Saxonhouse, University of Michigan

Hiroshi Ono, Stockholm School of Economics, "An Empirical Look at the Earnings of Japanese Men: The Significance of College Quality, Occupations, and Firm Size"
Discussants: Yukiko Abe, Asia University, and Mark E. Rebick, Oxford University

Vidhan K. Goyal and **Takeshi Yamada,** Hong Kong University of Science and Technology, "Asset Price Bubbles, Liquidity, and Investment: Evidence from Japan"
Discussants: Fumio Hayashi, and Kenneth D. West, NBER and University of Wisconsin

Andrea Boltho, Oxford University, "Italian and Japanese Foreign Trade Performance: From Early Similarities to Present Diversity"
Discussants: Bernadette Andreosso-O'Callaghan, University of Limerick, and Michael M. Knetter, NBER and Dartmouth College

Robert Dekle, University of Southern California, "Exchange Rates and Corporate Exposure: Evidence from Japanese Firm-Level Panel Data"
Discussants: Colin McKenzie, Osaka University, and Yuri N. Sasaki, Takachiho University

Yoshiro Miwa, University of Tokyo, and **J. Mark Ramseyer,** Harvard University, "The Value of Prominent Directors: Lessons in Corporate Governance from Transitional Japan"
Discussants: Takeo Hoshi, University of California, San Diego, and Tetsuji Okazaki, University of Tokyo

Carroll examines an implication of models of habit formation in consumption that has been largely overlooked: habits strong enough to explain certain observed empirical puzzles imply an immediate marginal propensity to consume (MPC) out of permanent shocks of much less than one. When Carroll's model is calibrated to roughly match the rise in the Japanese saving rate over the postwar period, it implies that the immediate MPC out of permanent tax cuts may be as low as 30 percent. This suggests that calls for a permanent income tax cut as a quick means of stimulating aggregate demand may have only a limited effect.

Braun and **Shioji** consider the response of the term structure of interest rates to monetary policy in Japan. Following Uhlig (1999) they impose restrictions on the posterior distribution of parameters of a vector autoregression and the range of identification schemes to produce impulse responses that accord well with a priori beliefs that are widely held among economists. They then use the identified monetary policy shock to estimate the response of the term structure in two different models: one is based strictly on a theory of term structure, while the other is a "reduced form" empirical model.

Ramaswamy and **Samiei** estimate a simple forward-looking model of the exchange rate to show that, on the whole, foreign exchange interventions have had small but persistent effects on the yen–dollar rate. They find that, contrary to conventional wisdom, sterilized interventions have mattered. Consistent with conventional wisdom, coordinated interventions have a higher probability of success and move the yen–dollar rate by a larger margin than

unilateral interventions. A probit model indicates that both an excessive appreciation and depreciation of the yen provoke interventions, and that interventions occur in clusters — if there is one today, there likely will be another tomorrow.

Klein, Peek, and **Rosengren** show that unequal access to credit among Japanese firms can explain the foreign direct investment (FDI) puzzle of the 1990s. Using a unique dataset that links Japanese firms to their main banks, the authors find that financial difficulties at banks were important both economically and statistically in reducing the number of FDI projects by Japanese firms in the United States. This holds true even after the authors control for the effects associated with the relative wealth movements driven by macroeconomic fluctuations in the exchange rate and stock market prices. As a result, there is strong empirical evidence that differences across firms in the degree of their access to credit can be an important determinant of FDI.

With a "sanctuary strategy," a firm uses restraints to competition in its home market to create a profit cushion that allows it to compete forcefully in foreign markets. **Schaede** uses evidence from Japan to focus on the domestic prerequisites of a successful sanctuary strategy, arguing that self-regulation by trade associations is an important predictor of success. Using a dataset containing 1,153 Japanese trade associations, the author first tests standard notions of cooperation and collusion, then develops new hypotheses to analyze the relevance of internal features of trade associations for self-regulation. He concludes that as self-regulation increases in Japan, so may the sanctuary strategies employed by Japanese firms.

Ono explores why the rate of return (ROR) to college education in Japan is lower than in its Western counterparts. Using 1995 data on Japanese workers and their mean scores on college entrance exams, he considers the relationship between individual ability, college quality, and earnings in the Japanese labor market. He finds that: 1) college quality significantly improves earnings; 2) tenure effects are significant and positive only among high-school graduates (not among college graduates); 3) firm-size differences are manifested as an interaction effect with experience; and 4) the earnings profiles for blue- and white-collar workers are parallel. The huge variation in the ROR with respect to college quality that he estimates confirms in part that the obsessive pursuit of college quality in Japan is in fact rational. The mean ROR used in international comparisons thus understates the significance of college quality in Japan.

Goyal and **Yamada** examine investment spending of Japanese firms around the time of the asset price bubble in the late 1980s to understand how stock valuations affect investment. They show first that corporate investment responds significantly to nonfundamental components of stock valuations during asset price bubbles; fundamentals matter less. Second, they find that it is the investment of bank-dependent firms that responds significantly to nonfundamental valuations during asset price shocks. Finally, they show that the time-series variation in investment-cash flow sensitivity is affected more by monetary policy changes than by shifts in collateral values during asset price shocks.

In the 1950s Italy and Japan had similar factor endowments and foreign trade shares and structures, with revealed comparative advantage (RCA) concentrated in semi-manufactured goods and consumer goods. At the end of the 1990s, the two countries' export structures were radically different, as were their trade shares in output. Japanese RCA had shifted to high-tech and investment products; Italy's remained concentrated in consumer goods. Japanese manufactured imports, as a share of GDP, had stagnated; Italy's had soared. **Boltho** concludes that these starkly divergent evolutions are tentatively linked to a different corporate governance structure in the two countries and to different government policies towards industry.

Dekle tests whether Japanese exporters behave as joint profit maximizers or as Cournot competitors in foreign markets. He finds that of the 15 export industries in his sample, 10 industries are better characterized as Cournot competitors, rather than 23 as joint profit maximizers. He estimates that exposure elasticities (the percentage change in profits arising from a 1 percent change in exchange rates) are much higher for industries characterized as Cournot competitors. He also finds that for all specifications (joint profit maximization and Cournot) and industries, the impact of a change in the exchange rate on the yen profit margins of Japanese exporters is negligible. This leads the author to conclude that the profits of Japanese firms fall when the yen appreciates because foreign sales become smaller in yen terms.

Miwa and **Ramseyer** use data on firms in the cotton spinning industry in turn-of-the-century Japan to explore the relationship between board composition and firm profitability. Through a variety of regression estimates, the authors conclude that firms who hired nationally prominent directors in one year had higher profits than their competitors in succeeding years. These nationally prominent directors apparently brought basic monitoring skills that turned out to be valuable. The authors also find that although firms with visible directors may have had an advantage in the capital market, quality certification seems at most a by-product (if even that) of the monitoring and intervention services these directors performed.

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Frontiers in Health Policy Research, Volume 3, edited by Alan M. Garber, is now available from the MIT Press. This series presents economic research on health care and health policy issues. This volume contains five papers presented at an annual conference held in Washington, D.C. Topics covered include: why firms spend so much on medical care; the costs and benefits of neonatal care; how regional differences in spending can inform the process of Medicare reform; how to measure HMO market share in evaluating managed care; and how to evaluate the quality of health care providers.

Contributors to the current volume include Laurence C. Baker and Mark McClellan, NBER and Stanford University; David M. Cutler and David A. Wise, NBER and Harvard University; Matthew Eichner, NBER and Columbia University; Ellen Meara, NBER and Harvard Medical School; Jonathan S. Skinner and Douglas O. Staiger, NBER and Dartmouth College; and John E. Wennberg, Dartmouth Medical School.

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Risk Aspects of Investment-Based Social Security Reform

Risk Aspects of Investment-Based Social Security Reform, edited by John Y. Campbell and Martin Feldstein, will be available from the University of Chicago Press this fall for $69.00. This NBER conference volume includes papers discussed at a conference in 1999.

Since our current Social Security system operates on a pay-as-you-go basis, benefits are paid almost entirely out of current revenues. But as the ratio of retirees to taxpayers increases, concern about the high costs of providing benefits in the current system has led economists to explore other options. One involves "prefunding," in which some of a person's payroll tax payments are invested in financial instruments, such as stocks and bonds, the eventual returns from which would help to fund his or her retirement.

The risks introduced by such a system — such as the volatility in the market prices of investment assets — are the focus of this volume. The book's contributors explore the issues involved in measuring risk and develop models to reflect the risks of various investment-based systems. They also evaluate the magnitude of the risks that both retirees and taxpayers would assume, concluding that these risks are actually moderate relative to the improved return, as well as being balanced by the ability of an investment-based system to adapt to differences in individual preferences and conditions.

Campbell is a Research Associate in the NBER's Programs on Asset Pricing, Monetary Economics, and Economic Fluctuations and Growth, and the Otto Eckstein Professor of Applied Economics at Harvard University. Feldstein is President and CEO of the NBER and the George F. Baker Professor of Economics at Harvard University.

Behavioral and Distributional Effects of Environmental Policy

Behavioral and Distributional Effects of Environmental Policy, edited by Carlo Carraro and Gilbert E. Metcalf, is available this fall from the University of Chicago Press for $52.00

This NBER conference volume examines the trade-offs involved in designing policies to deal with environmental problems. Reflecting the broad nature of the subject, the contributors include leading economists in the areas of public finance, industrial organization, and trade theory, as well as environmental economists. They examine environmental policy design as it relates to location decisions, compliance costs, administrative costs, effects on research and development, and international factor movements. Shedding light on an extraordinarily complex and important topic, this collection will be of interest to all those involved in designing effective environmental policy.

Carraro is Professor of Environmental Economics at the University of Venice and Research Director of the Fondazione Eni Enrico Mattei. Metcalf is a Research Associate in the NBER's Program on Public Economics and a professor of economics at Tufts University.

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7871	Fernando Alvarez Andrew Atkeson Partick J. Kehoe	Money, Interest Rates, and Exchange Rates with Endogenously Segmented Asset Markets
7872	Andrew K. Rose Charles Engel	Currency Unions and International Integration

Paper	Author(s)	Title
7873	Frederik P. Schlingemann René M. Stulz Ralph A. Walkling	Asset Liquidity and Segment Divestitures
7874	Anne Case I-Fen Lin Sara McLanahan	Educational Attainment in Blended Families
7875	Julian R. Betts Jeff Grogger	The Impact of Grading Standards on Student Achievement, Educational Attainment, and Entry-Level Earnings
7876	Scott Stern Michael E. Porter Jeffrey L. Furman	The Determinants of National Innovative Capacity
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7878	James J. Choi David Laibson Andrew Metrick	Does the Internet Increase Trading? Evidence from Investor Behavior in 401(k) Plans
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7880	Eiji Fujii Menzie D. Chinn	*Fin De Siècle* Real Interest Parity
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7884	N. Gregory Mankiw	The Inexorable and Mysterious Tradeoff Between Inflation and Unemployment
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7886	Ronald G. Ehrenberg John J. Cheslock Julia Epifantseva	Paying our Presidents: What do Trustees Value?
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7890	David H. Autor Frank Levy Richard Murnane	Upstairs, Downstairs: Computer-Skill Complementarity and Computer-Labor Substitution on Two Floors of a Large Bank

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7896	Mary Kay Gugerty Michael Kremer	Outside Funding of Community Organizations: Benefiting or Displacing the Poor?
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7898	Herschel I. Grossman	Inventors and Pirates: Creative Activity and Intellectual Property Rights
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7906	Karen E. Dynan Jonathan Skinner Stephen P. Zeldes	Do the Rich Save More?
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Paper	Author(s)	Title
7912	Patric H. Hendershott Bryan D. MacGregor Raymond Y.C. Tse	Estimating the Rental Adjustment Process
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7932	Jeremy Atack Fred Bateman Robert A. Margo	Rising Wage Dispersion Across American Manufacturing Establishments, 1850-1880

Paper	Author(s)	Title
7933	Torben G. Andersen Tim Bollerslev Francis X. Diebold Heiko Ebens	The Distribution of Stock Return Volatility
7934	Holger Sieg V. Kerry Smith Spencer Banzhaf Randy Walsh	Using Locational Equilibrium Models to Evaluate Housing Price Indexes
7935	Michelle Lowry G. William Schwert	IPO Market Cycles: Bubbles or Sequential Learning?
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7938	Daron Acemoglu	Credit Market Imperfections and Persistent Unemployment
7939	Chiaki Moriguchi	The Evolution of Employment Relations in U.S. and Japanese Manufacturing Firms, 1900-1960: A Comparative Historical and Institutional Analysis
7940	Susanto Basu John Fernald	Why Is Productivity Procyclical? Why Do We Care?
7941	Werner Antweiler Daniel Trefler	Increasing Returns and All That: A View From Trade
7942	Donna B. Gilleskie Thomas A. Mroz	Estimating the Effects of Covariates on Health Expenditures
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7949	Bruce Sacerdote	The Nature and Nurture of Economic Outcomes
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7951	P.R. Agénor J. Aizenman A. Hoffmaister	The Credit Crunch in East Asia: What can Bank Excess Liquid Assets Tell us?

Paper	Author(s)	Title
7952	Marianne Bertrand Paras Mehta Sendhil Mullainathan	Ferreting Out Tunneling: An Application to Indian Business Groups
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