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Program Report

International Finance and Macroeconomics

Jeffrey A. Frankel*

This summary of research by members of the NBER's Program on International Finance and Macroeconomics describes work on particular parts of the world, including the emerging markets, Japan, and Europe, as well as studies of international economic integration and flexible exchange rates that have universal relevance.

Recent Crises in Emerging Markets

Recurrent crises in emerging markets warrant much thought, and NBER researchers have responded accordingly. Some of their work has been discussed in a series of conferences organized by NBER President Martin Feldstein and in annual meetings of the NBER's InterAmerican Seminar in Economics and the East Asian Seminar in Economics.

The most recent three-year period began with a number of postmortems on the Mexican peso crisis, including discussions of the origins of the crisis in 1994—by Sebastian Edwards, Andrew M. Warner, and Sergio L. Schmukler and me—and analysis of its aftermath in 1995—by Edwards and Miguel Savastano and Anne Krueger and Aaron Tornell.¹

The return of crises in East Asia in 1997, and their spread to emerging market countries around the world in 1998, likewise raised a number of questions, including what had caused this turmoil.² Several explanations

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were considered, including the high and variable volume of flows in modern, liberalized international capital markets.³

Another possible explanation is increases in world interest rates, which seem to have been proximate causes in earlier crises, although less relevant in 1997–8.⁴ A third possibility is the behavior of foreign investors, and a fourth is the composition of capital inflows.⁵ A high level of foreign direct investment seems to be helpful, but a concentration of short-term dollar-denominated debt, especially relative to reserves, is a danger signal. Rodrik and Velasco show that the short-term debt-to-reserves ratio is a robust predictor of financial crises.⁶

Another possible explanation for the crises is attempts to maintain pegged exchange rates.⁷ Such attempts in the crisis countries ended when foreign exchange reserves were depleted. The impact on the economy from the resulting devaluation was greater than if the currency peg had been abandoned earlier. Policies to fix exchange rates in Latin America were often the legacy of attempts to stabilize from high inflation rates in the 1980s.⁸ In East Asia these policies have been complicated by rapid growth and by movements in the yen-dollar exchange rate.⁹

For some time there has been a division between those who attribute currency crises to traditional fundamentals, including overly expansionary monetary policy and other macroeconomic policy mistakes—for example, Michael D. Bordo and Anna J. Schwartz—and those who attribute it to investor panic and multiple equilibria, such as Steven Radelet and Jeffrey D. Sachs.¹⁰ These competing theories of balance-of-payments crises have been classified as first-versus second-generation models of speculative attacks. Research by Robert P. Flood and Nancy P. Marion,

Maurice Obstfeld, and Velasco has put the different models into context.¹¹

In East Asia, most of the countries had relatively good macroeconomic fundamentals. As a result, diagnoses of crises there emphasize a different sort of fundamentals instead of macroeconomic policies: distortions in the financial structures of emerging economies.¹² Specifically, a third generation of models of currency crises sought to explain "crony capitalism," defined more formally as implicit government guarantees for poorly regulated banks and corporate debtors, which create moral hazard. The pioneering leader of these models, writing before the East Asia crisis began, was Michael P. Dooley.¹³ Others who developed the models include Chinn, Dooley, and Sona Shrestha; Craig Burnside; Martin S. Eichenbaum and Sergio Rebelo; and Aizenman.¹⁴

An important question to address is why the crises were so severe once they occurred, inflicting recession, bankruptcy, and poverty on much of the economy. Chang and Velasco have emphasized the post-devaluation burden of short-term dollar-denominated debt.¹⁵ Banks and firms find that they cannot service their dollar-denominated debt after the devaluation because their revenues are primarily in local currency. James Levinsohn, Steven Berry, and Jed Friedman show that, in part because of debt problems, the poor in Indonesia indeed were hit the hardest.¹⁶

At the same time, there has been a rethinking of the traditional view that a country that abandons its exchange rate target has the solace of lower interest rates and a related stimulus to growth and employment. Even in looking at Western Europe, Robert J. Gordon challenges the conventional wisdom that those who devalued in 1992-3 were rewarded with noninflationary growth.¹⁷ In the case of East Asia, especially, the crisis victims

suffered from high interest rates and sharp recessions regardless of whether they devalued early, late, or not at all.

Another topic our program addresses is contagion: the tendency for a currency crisis in one emerging-market country to be followed by troubles in others far away. Such situations have now gone beyond correlations that can readily be explained by competition in export markets. For example, the contagion from Russia to Brazil in August 1998 cannot be explained easily by trade links between these two countries, nor by competition in third markets. A number of IFM Program members have been studying contagion.¹⁸

How can crises be prevented in the future, or at least be made less frequent and less severe? Some researchers have begun to study proposals for restrictions on capital flows. Chile maintained penalties on short-term capital inflows, which appear to have succeeded in changing the composition of its inflows at least. However, Edwards warns that these penalties do not explain Chile's success.¹⁹ Leonardo Bartolini and Drazen point out that liberalization of capital outflows sends a positive signal to investors and can result in increased inflows.²⁰ Karen K. Lewis also looks at official international restrictions on capital flows.²¹

Some proposals for modification of the international financial architecture call for a reform of multilateral institutions.²² Work by Feldstein and Ricardo J. Caballero and Arvind Krishnamurthy offers some innovative ideas about the provision of international collateral by developing country borrowers.²³

Japan and the European Union

Members of the IFM program have continued to watch the industrialized

world as well as the emerging markets. In the 1990s Japan found itself in a recession trap that was worse than most forecasts, while Europe entered a monetary union that so far has succeeded better than many had forecast.

The banking system played a central role in the decade-long Japanese slump, despite both the Basel capital standards agreement and the Big Bang of 1998 trying to nudge Japanese banks into the modern era. The premium that Japanese banks pay for funds helps to explain their problems.²⁴

In January 1999 the European Economic and Monetary Union (EMU) was inaugurated, and the euro, its common currency, was born. NBER researchers analyzed a variety of aspects of the immediate transition to the EMU.²⁵ Obstfeld, Giovanni Peri, and others also examined the fundamental question for the longer term: is Europe suited to a common currency?²⁶ Feldstein has suggested that the EMU does not make economic sense and was instead adopted for political reasons.²⁷

A number of IFM Program members have considered how the new European Central Bank (ECB) could conduct monetary policy.²⁸ Lars E. O. Svensson suggests that the ECB could target the price level.²⁹ Richard Portes and Helene Rey predict that the euro will rival the dollar some day as an international currency.³⁰ Michael B. Devereux, Charles M. Engel, and Tille consider the implications of trade being invoiced in euros.³¹ Casella asks what fiscal policy might be under the European stability pact, and William H. Branson, Jorge Braga de Macedo, and Jurgen von Hagen wonder about prospective policy expansion to the East.³²

Some of the NBER research on the European economy is presented at the NBER's International Seminar on Macroeconomics (ISOM), which

takes place each summer in a different European country. For the past several years, ISOM has been under the direction of Andrew K. Rose and Charles Wyplosz.

Global Economic Integration

IFM Program members have continued to investigate the extent, nature, and effects of global integration. One important new approach has been to incorporate in the analysis data on transactions among cities or provinces within the same country with data on transactions between countries. This makes it possible to identify the effects of national borders and national currencies, not just the effects of geographic separation. This approach has been used by John F. Helliwell and Ross McKittrick and Obstfeld.³³

Some researchers take a historical perspective, looking back over the entire twentieth century. International economists can surprise people by showing that financial integration 100 years ago by many measures was as high as, or even higher than, it is today. For example, early in the century capital flows allowed greater gaps between countries' saving and investment levels than existed in the postwar period.³⁴ Bordo, Eichengreen, and Jongwoo Kim argue that the increase in financial integration has been greater than international economists allow; Bordo, Eichengreen, and Douglas A. Irwin argue the same for globalization more generally, including integration with respect to trade.³⁵

One method of studying international integration with respect to trade is to look at the ability of arbitrage to eliminate geographical differences in prices. Such tests on the general price level are part of the large literature on purchasing power parity.³⁶ Tests of arbitrage are particularly interesting when they focus

on prices of specific, narrowly defined commodities and examine the role of distance and transport costs between geographic locations.³⁷ Notwithstanding the much-touted trend of globalization, geographic distance remains a very important factor in trade, as are political barriers such as national borders and national currencies.

Flexible Exchange Rates

All of the preceding issues bear on the choice of exchange rate regime, particularly fixed versus floating rates, and on whether the question is more difficult in a world of international financial integration.³⁸ Both regimes have advantages, of course. Fixed rates provide a noninflationary anchor for monetary policy. Pegged regimes are characterized by lower inflation but higher variability of output.³⁹ Exchange rate stability also purportedly promotes international trade and investment.⁴⁰ That point is particularly relevant if the variability that shows up under a floating regime is attributable to gratuitous "noise trading," as Olivier Jeanne and Rose suggest.⁴¹ Floating rates, on the other hand, may allow monetary independence. But how do we trade off these advantages?

Recent currency crises in emerging markets have convinced some observers that a general move toward increased exchange rate flexibility is in order. The success of some countries with currency boards or full monetary union has convinced others that rigid institutional commitments to fixed rates are the solution. A third, newly popular view is that either of the two extremes—free floating or firm fixing—is tenable, but that intermediate regimes including target zones are not. In truth, however, no single regime, whether fixed or floating, can be right for all countries. The choice depends on the

specific characteristics of the country in question.⁴²

On what does the choice of regime depend? Traditional theory included such criteria as openness and synchronicity of business cycles. Recent experience has added other criteria, emphasizing initial conditions (such as price-setting behavior, the prevalence of dollar debt, and the adequacy of reserve levels) and factors relevant for the credibility of giving monetary policy an exchange rate anchor (such as the political economy of a hyperinflationary past).⁴³ All of these characteristics can themselves be influenced by the choice of exchange rate regime. Countries that fix their exchange rates and thereby promote trade are more likely to qualify as an optimum currency area *ex post* than *ex ante*.⁴⁴

Meanwhile, econometricians continue to search for an explanation of the seemingly random movements in the exchange rate. Some have pursued the traditional macroeconomic approach, which looks at determinants such as fiscal policy.⁴⁵ Others have pursued the new microstructure approach.⁴⁶

The effects of exchange rate movements on employment have been studied by a number of NBER researchers.⁴⁷ Others have asked how firms deal with exchange rate volatility.⁴⁸ Firms can hedge away exchange rate risk.⁴⁹ But hedging is not free; a risk premium separates the forward rate from the expected future spot rate.⁵⁰ The prospect of eliminating the exchange risk premium is one of the attractions of firmly fixed exchange rates.

Increasingly, these central questions of financial integration and exchange rate regimes are relevant for all countries, for emerging markets as much as for the industrialized world.

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Research Summaries

Emerging Equity Markets and Market Integration

Geert Bekaert*

Overview

In the early 1990s, developing countries shrugged off a decade lost in the costly complications of the Debt Crisis and regained access to foreign capital. Not only did capital flows to emerging markets increase dramatically, but their composition changed substantially as well. Portfolio flows (fixed income and equity) and foreign direct investment replaced commercial bank debt as the dominant sources of foreign capital. This could not have happened without these countries embarking on a financial liberalization process, relaxing restrictions on foreign ownership, and taking other measures to develop their capital markets, often in tandem with macroeconomic and trade reforms.¹ New capital markets emerged as a result, and the consequences were dramatic. For example, in 1985 Mexico's equity market capitalization was 0.71 percent of GDP and only accessible by foreigners through the Mexico Fund trading on the New York Stock Exchange. In 1995 this figure rose to 20.53 percent of GDP, and U.S. investors were holding about 19 percent of the market.

From the perspective of investors in newly available developed markets, what are the diversification benefits of investing? And from the perspective of the developing coun-

tries themselves, what are the effects of increased foreign capital on domestic financial markets and ultimately on economic growth?

Market integration is central to both questions. In finance, markets are said to be integrated when assets of identical risk command the same expected return. In theory, liberalization should bring about integration with the global capital market, and its effects on equity markets are then clear. Foreign investors will bid up the prices of local stocks with diversification potential while inefficient sectors will be shunned by all investors. Overall, the cost of equity capital should go down, which in turn may increase investment and ultimately increase economic welfare.²

Foreign investment can also have adverse effects, as the recent crises in Mexico and Southeast Asia have illustrated. For example, foreign capital flows may complicate monetary policy, drive up real exchange rates, and increase the volatility of local equity markets. Moreover, in diversifying their portfolios toward emerging markets, rational investors should consider that the integration process may lower expected returns and increase correlations between emerging market and world market returns. To the extent that the benefits of diversification are severely reduced by the liberalization process, there may be less of an increase in the original equity price. Ultimately, all of these questions require empirical answers, which my research has attempted to provide.

Diversification

Although emerging market equity returns are highly volatile, they are

only slightly correlated with equity returns in the developed world, making it possible to construct low-risk portfolios. Early studies show very significant diversification benefits for emerging market investments, even billing them as a "free lunch." However, these studies used market indexes compiled by the International Finance Corporation (IFC) that generally ignore the high transaction costs, low liquidity, and investment constraints associated with emerging market investments.

Michael S. Urias and I³ measure the diversification benefits from emerging equity markets using data on closed-end funds, open-end funds, and American Depositary Receipts (ADRs). Unlike the IFC indexes, these assets are easily accessible to retail investors, and investment costs are comparable to investment costs for U.S.-traded stocks. The distinguishing feature of closed-end funds is that fund share prices generally deviate from their portfolio value (known as "net asset value"); they may trade at a premium when the assets are invested in closed or restricted markets, or at a discount when the foreign market has unusual political risk. Historically, they have been an important means of access to restricted markets, while open-end funds and ADRs were relatively unimportant before 1993.

We generally find that investors give up a substantial part of the diversification benefits by holding closed-end funds instead of the underlying portfolios; they do so to the point that the benefits from investing in U.S.-traded closed-end funds are not statistically significant relative to an internationally diversified portfolio benchmark. Open-end

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funds, on the other hand, track the underlying IFC indexes much better than the other investment vehicles and prove to be the best diversification instrument in our sample.

By removing price segmentation, liberalizations may increase correlations and hence reduce diversification benefits. Using a model in which conditional correlations depend on world volatility and variables tracking the degree of integration, Campbell R. Harvey and I find that, for some countries—for example, Thailand—correlations increase markedly around the time of liberalization.⁴ The average response of these conditional correlations to liberalizations in 17 emerging markets is a small but statistically significant increase of 0.08 at most.

Integration

MEASURING MARKET INTEGRATION

The degree of market integration is notoriously difficult to measure. For example, investment restrictions may not be binding, or there may be indirect ways to access local equity markets (for example, through country funds or ADRs). Also, there are many kinds of investment barriers, and the liberalization process is typically a complex and gradual one. In an exploratory paper⁵ I distinguish between three different kinds of barriers. The first are legal barriers arising from the different legal status of foreign and domestic investors—for example, foreign ownership restrictions and taxes on foreign investment. The second are indirect barriers arising from differences in available information, accounting standards, and investor protection. The third are barriers arising from emerging-market specific risks (EMSRs) that discourage foreign investment and lead to de facto segmentation. EMSRs include liquidity risk, political risk, economic policy risk, and perhaps currency risk. Some

might argue that these risks are in fact diversifiable and not priced. However, World Bank surveys of institutional investors in developed markets found that liquidity problems were seen as major impediments to investing in emerging markets. In recent work, however, Claude B. Erb, Harvey, Tadas E. Viskanta, and I found political risk to be priced in emerging markets.⁶

When I measure the three types of broadly defined investment barriers for 19 emerging markets, I find that some direct barriers to investment are not significantly related to a return-based quantitative measure of market integration. However, indirect barriers, such as poor credit ratings and the lack of a high-quality regulatory and accounting framework, are strongly related cross-sectionally with the integration measure. These results reveal the danger in measuring market integration purely by investigating the market's regulatory framework.

My work proposes three potential solutions to this problem.⁷ First, Harvey and I measure the degree of integration directly from equity return data using a parameterized model of integration versus segmentation (a regime-switching model).⁸ The model yields a time-varying measure of the extent of integration between 0 and 1. In many countries, with Thailand as a stark example, variation in the integration measure coincides with capital market reforms. In contrast to general perceptions at the time of this article, our results suggest that some countries became less integrated over time.

In other work with Harvey, I use bilateral capital flow data to construct measures of U.S. holdings of the emerging market as a percentage of market capitalization.⁹ We then determine the time at which capital flows experienced a structural break as a proxy for when foreign investors may have become marginal investors in

these markets. Although this measure avoids having to specify an asset pricing model and avoids noisy return data, the capital flow data that we use are notoriously low quality, and the United States is the only country for which we have detailed data on bilateral monthly flows with emerging markets.

Finally, Robin L. Lumsdaine, Harvey, and I exploit the idea that market integration is an all-encompassing event that should change the return-generating process, and with it the stochastic process governing other economic variables. We use a novel methodology to both detect breaks and “date” them, looking at a wide set of financial and economic variables.¹⁰ Our break dates are mostly within two years of one of four alternative measures of a liberalization event: a major regulatory reform liberalizing foreign equity investments; the announcement of the first ADR issue; the first country fund launching; and a large increase in capital flows.

EFFECTS OF MARKET INTEGRATION

In a recent paper, Harvey and I measure how liberalization has affected the equity return-generating process in 20 emerging markets,¹¹ focusing primarily on the cost of equity capital. Given the complexity of the liberalization process, we define capital market liberalizations using the four alternative measures discussed previously. To measure the cost of capital, we use dividend yields. The integration process should lead to a positive return-to-integration ratio (as foreign investors bid up local prices) but to lower post-liberalization returns. Given high return volatility and considerable uncertainty in timing the liberalization, average returns cannot be used to measure changes in the cost of capital. Dividend yields capture the permanent price effects of a change in the cost of capital better than noisy returns do.

With a surprising robustness across specifications, we find that dividend yields decline after liberalizations, but that the effect is always less than 1 percent on average. The results are somewhat stronger when we use the break dates discussed earlier. Peter B. Henry finds similar results using a different methodology and a slightly different sample of countries.¹²

Harvey, Lumsdaine, and I¹³ investigate the joint dynamics of returns and net U.S. equity flows that accompany liberalizations. We find that net capital flows to emerging markets increase rapidly after liberalization as investors rebalance their portfolios, but that they then fall back, as we would expect. Even after liberalization, unexpected shocks to flows increase returns contemporaneously, but the effect is partially permanent, suggesting that additional flows reduce the cost of capital.

DEVELOPMENT AND FOREIGN CAPITAL

Most of my research has tried to draw inferences with a somewhat reluctant dataset. Emerging market returns are highly non-normal and highly volatile, and the samples are short.¹⁴ Moreover, a dominating characteristic of the data is a potentially gradual, structural break. Although it is generally difficult to make inferences in such a setting, a few robust findings emerge: the liberalization process has led to a very small increase in correlations with the world market and a small decrease in dividend yields. This decrease could represent a decrease in the cost of capital or an improvement in growth opportunities; Harvey and I attribute some of the decrease to improved growth opportunities. Despite the rather small change, the effect on economic welfare may be substantial if it leads to increased productive investment.¹⁵ Harvey and I find that the aggregate investment-to-GDP ratio increases significantly after liberalizations (by about 70 basis points).

Using a very different methodology, Henry also reports that financial and economic liberalization increases aggregate investment.¹⁶

With a number of recent crises in emerging markets, the role of foreign capital in developing countries is under intense scrutiny. Malaysia already has re-imposed capital controls. Thus it is remarkable that I have so far failed to find negative effects of foreign investment on emerging markets. For example, although policymakers often complain about foreigners inducing excess volatility in local markets, my empirical tests with Harvey never reveal a robust increase in volatility after liberalization. In other work, we cannot confirm the often-heard argument that foreign capital consistently drives up real exchange rates.¹⁷

Despite the very real problems in the financial and corporate sectors of the crisis countries in Southeast Asia, the current literature on the effects of capital flows on emerging markets reveals little reason for rich developed countries to discontinue their financing of developing countries' development. After all, one potential reason for the disappointingly small effect of the cost of capital that Harvey and I find may be a combination of "segmentation risk"—foreign investors anticipating future policy reversals toward foreign investment restrictions—and home bias. "Home bias" refers to the fact that investors across the world have fairly small proportions of their assets allocated to foreign markets, and the proportion allocated to emerging markets is minuscule. I cannot help but wonder whether a world blessed with a vast pool of private, internationally active, speculative capital would have faced the kind of liquidity crises we have seen in recent years, and in their wake the many proposals to limit capital flows that have been made.

¹ See G. Bekaert and C. R. Harvey, "Capital Flows and the Behavior of Emerging Market Equity Returns," forthcoming in *Capital Flows and the Emerging Economies: Theory, Evidence, and Controversies*, S. Edwards, ed. Chicago: University of Chicago Press, for detailed timelines on important structural changes in emerging countries.

² See G. Bekaert and C. R. Harvey, "Foreign Speculators and Emerging Equity Markets," forthcoming in *Journal of Finance*, and R. M. Stulz, "International Portfolio Flows and Security Markets," in *International Capital Flows*, M. S. Feldstein, ed. Chicago: University of Chicago Press, 1999, for a more elaborate account.

³ G. Bekaert and M. S. Urias, "Diversification, Integration, and Emerging Market Closed-End Funds," *Journal of Finance*, 51, No. 3 (July 1996), pp. 835–69, and "Is There a Free Lunch in Emerging Market Equities?" *Journal of Portfolio Management*, 25 (Spring 1999), pp. 83–95.

⁴ See G. Bekaert and C. R. Harvey, "Emerging Equity Market Volatility," *Journal of Financial Economics*, 43 (1997), pp. 29–78.

⁵ G. Bekaert, "Market Integration and Investment Barriers in Emerging Equity Markets," *World Bank Economic Review*, 9 (1995), pp. 75–107.

⁶ G. Bekaert, C. B. Erb, C. R. Harvey, and T. E. Viskanta, "What Matters for Emerging Equity Market Investments," *Emerging Markets Quarterly*, 1 (1997), pp. 17–46.

⁷ See C. R. Harvey, "The Future of Investment in Emerging Markets," NBER Reporter, Summer 1998, for a more detailed summary of this work.

⁸ G. Bekaert and C. R. Harvey, "Time-Varying World Integration," *Journal of Finance*, 50 (1995), pp. 403–44.

⁹ Bekaert and Harvey, "Capital Flows and the Behavior of Emerging Market Equity Returns."

¹⁰ G. Bekaert, C. R. Harvey, and R. L. Lumsdaine, "Dating the Integration of World Capital Markets," NBER Working Paper No. 6724, September 1998.

¹¹ Bekaert and Harvey, "Foreign Speculators and Emerging Equity Markets."

¹² P. B. Henry, "Stock Market Liberalization, Economic Reform, and Emerging Market Equity Prices," *Journal of Finance*, forthcoming.

¹³ G. Bekaert, C. R. Harvey, and R. L. Lumsdaine, "The Dynamics of Emerging Market Equity Flows," NBER Working Paper No. 7219, July 1999.

¹⁴ See G. Bekaert, C. B. Erb, C. R. Harvey, and T. E. Viskanta, "Distributional Characteristics of Emerging Market Returns and Asset Allocation," *Journal of Portfolio Management*, 24 (1998), pp. 102-16, for a description of these properties.

¹⁵ For a literature survey on the ways in

which efficient financial intermediation in general and financial market integration in particular has affected economic growth, see G. Bekaert and C. R. Harvey, "Capital Markets: An Engine for Economic Growth," *The Brown Journal of World Affairs*, 5, no. 1 (Winter-Spring 1998), pp. 33-53.

¹⁶ P. B. Henry, "Do Stock Market Liberalizations Cause Investment Booms?" *Journal of Financial Economics*, forthcoming.

¹⁷ Bekaert and Harvey, "Capital Flows and the Behavior of Emerging Market Equity Returns."

Forecasting and Empirical Methods in Finance and Macroeconomics

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All economic agents forecast all the time, and forecasting figures especially prominently in financial and macroeconomic contexts. Central to finance, for example, is the idea of expected present value of earnings flows, and central to macroeconomics is the idea of expectations and their effects on investment and consumption decisions. Moreover, predictive ideas in finance and macroeconomics are very much intertwined. For example, modern asset pricing models attribute excess returns and return predictability in part to macroeconomic factors such as recession risk.

In finance recently, there has been extensive inquiry into issues such as long-horizon mean reversion in asset returns, persistence in mutual fund performance, volatility and correlation forecasting with applications to financial risk management, and selection biases attributable to survival or

data snooping.¹ In macroeconomics, we have seen the development and application of new coincident and leading indicators and tracking portfolios, diffusion indexes, regime-switching models (with potentially time-varying transition probabilities), and new breeds of macroeconomic models that demand new tools for estimation and forecasting.

The development and assessment of econometric methods for use in empirical finance and macroeconomics, with special emphasis on problems of prediction, is very important. That is the subject of my own research program, as well as of an NBER working group that Kenneth D. West and I lead.² Here I describe some aspects of that research, ranging from general issues of forecast construction and evaluation to specific topics such as financial asset return volatility and business cycles.

Forecast Construction and Evaluation in Finance and Macroeconomics

Motivated by advances in finance and macroeconomics, recent research has produced new forecasting methods and refined existing ones.³ For example, prediction problems involving asymmetric loss functions arise routinely in many fields, includ-

ing finance, as when nonlinear tax schedules have different effects on speculative profits and losses.⁴ In recent work, I have developed methods for optimal prediction under general loss structures, characterized the optimal predictor, provided workable methods for computing it, and established tight links to new work on volatility forecastability, which I discuss later.⁵

In related work motivated by financial considerations, such as "convergence trades," and macroeconomic considerations, such as long-run stability of the "great ratios," Peter F. Christoffersen and I have considered the forecasting of co-integrated variables. We show that at long horizons nothing is lost by ignoring co-integration when forecasts are evaluated using standard multivariate forecast accuracy measures.⁶ Ultimately, our results suggest not that co-integration is unimportant but that standard forecast accuracy measures are deficient because they fail to value the maintenance of co-integrating relationships among variables. We suggest alternative measures that explicitly do this.

Forecast accuracy is obviously important because forecasts are used to guide decisions. Accuracy is also important to those who produce forecasts, because reputations and fortunes rise and fall with their accu-

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racency. Comparisons of forecast accuracy are also important more generally to economists, as they must discriminate among competing economic hypotheses. Predictive performance and model adequacy are inextricably linked: predictive failure implies model inadequacy.

The evaluation of forecast accuracy is particularly common in finance and macroeconomics. In finance, one often needs to assess the validity of claims that a certain model can predict returns relative to a benchmark, such as a martingale. This is a question of point forecasting, and much has been written about the evaluation and combination of point forecasts.⁷ In particular, Roberto S. Mariano and I have developed formal methods for testing the null hypothesis: that there is no difference in the accuracy of two competing forecasts.⁸ A wide variety of accuracy measures can be used (in particular, the loss function need not be quadratic, nor even symmetric), and forecast errors can be non-Gaussian, non-zero mean, serially correlated, and contemporaneously correlated. Subsequent research has extended our approach to account for parameter estimation uncertainty⁹ and data snooping bias.¹⁰

Recent developments in finance and financial risk management encourage the use of density forecasts: forecasts stated as complete densities rather than as point forecasts or confidence intervals. However, appraisal of density forecasts has been hampered by lack of effective tools. In recent work with Todd A. Gunther and Anthony S. Tay, I have developed a framework for rigorously assessing the adequacy of density forecasts under minimal assumptions. I have used the new tools to evaluate a variety of density forecasts involving both simulated and actual equity and exchange rate returns.¹¹

Most recently, Jinyong Hahn, Tay,

and I have extended the density forecast evaluation methods to the multivariate case.¹² Among other things, the multivariate framework lets us evaluate the adequacy of density forecasts in capturing cross-variable interactions, such as time-varying conditional correlations. We also provide conditions under which a technique of density forecast "calibration" can be used to improve density forecasts that are deficient. We show how the calibration method can be used to generate good density forecasts from econometric models, even when the conditional density is unknown.

Density forecast evaluation methods are also valuable in macroeconomic contexts, as my recent work with Tay and Kenneth F. Wallis demonstrates.¹³ Since 1968, the Survey of Professional Forecasters has asked respondents to provide a complete probability distribution of expected U.S. inflation. Evaluation of the adequacy of those density forecasts reveals several deficiencies. The probability of a large negative inflation shock is generally overestimated. And, in more recent years, the probability of a large shock of either sign is overestimated.

Modeling and Forecasting Financial Asset Return Volatility

Volatility and correlation are central to finance. Recent work has clarified the comparative desirability of alternative estimators of volatility and correlation and has noted the attractive properties of the so-called realized volatility estimator, used prominently in the classic work of Robert Merton, Kenneth French, and others. Realized volatility is trivial to compute. Further, we now know that under standard diffusion assumptions, and when using the high-frequency underlying returns now becoming widely available, realized

volatility is effectively an error-free measure. Hence, for many practical purposes, we can treat volatilities and correlations as observed rather than latent.

Observable volatility creates entirely new opportunities: we can analyze it, optimize it, use it, and forecast it with much simpler techniques than the complex econometric models required when volatility is latent. My recent work with Torben Andersen, Tim Bollerslev, and Paul Labys exploits this insight intensively, in understanding both the unconditional and conditional distributions of realized asset return volatility, in developing tools for optimizing the construction of realized volatility measures, in using realized volatility to make sharp inferences about the conditional distributions of asset returns, and in explicit modeling and forecasting of realized volatility.¹⁴

Noteworthy products of the research include a simple normality-inducing volatility transformation, high contemporaneous correlation across volatilities, high correlation between correlation and volatilities, pronounced and highly persistent temporal variation in both volatilities and correlation, evidence of long-memory dynamics in both volatilities and correlation, and precise scaling laws under temporal aggregation.¹⁵ The results should be useful in producing improved strategies for asset pricing, asset allocation, and risk management, which explicitly account for time-varying volatility and correlation.

Any such strategies exploiting time-varying volatility or correlation, however, require taking a stand on the horizon at which returns are measured. Different horizons are relevant for different applications (for example, managing a trading desk versus managing a university's endowment). Hence, related work involving volatility estimation and forecasting in financial risk management has fo-

cused on the return horizon. In a study with Andrew Hickman, Atsushi Inoue, and Til Schuermann, I examine the common practice of converting one-day volatility estimates to "h-day" estimates by scaling by the square root of h. This turns out to be inappropriate except under very special circumstances routinely violated in practice.¹⁶ Another more broadly focused study with Christoffersen uses a model-free procedure to assess the forecastability of volatility at various horizons ranging from a day to a month.¹⁷ Perhaps surprisingly, the forecastability of volatility turns out to decay rather quickly with the horizon. This suggests that volatility forecastability, although clearly relevant for risk management at short horizons, may be much less important at longer horizons. We are currently at an interesting juncture in regard to long-horizon volatility forecastability: some studies are indicating long memory in volatility forecastability and others are not. Very much related is the possibility of structural breaks, which can masquerade as long memory. This is an important direction for future research, and I have begun to tackle it in recent work with Inoue.¹⁸

Econometric Methods for Business Cycle and Macroeconomic Modeling

After nearly a decade of strong growth, it is tempting to assert that the business cycle is dead. It is not. Indeed, a recession is coming — we just don't know when. Another strand of my work, much of it with Glenn D. Rudebusch, centers on the econometrics of business cycles and business cycle modeling. In part, the research is eclectic and scattered, ranging from early work on business cycle duration dependence to later work on strategic complementarity and job durations.¹⁹ But much of it is

organized around three general themes, which I discuss briefly in turn.²⁰

What are the defining characteristics of the business cycle? Two features are crucial. The first involves the co-movement of economic variables over the cycle, or, roughly speaking, how broadly business cycles are spread throughout the economy. The notion of co-movement — particularly accelerated or delayed co-movement — leads naturally to notions of coincident, leading, and lagging business cycle indicators. The second feature involves the timing of the slow switching between expansions and contractions, and the persistence of business cycle regimes.

Central to much of the work is the idea of a dynamic factor model with a Markov switching factor, which simultaneously captures both co-movement and regime switching,²¹ as recently implemented using Markov chain Monte Carlo methods.²²

How can business cycle models be evaluated? One way or another, we want to assess business cycle models empirically, by checking whether the properties of our model economy match those of the real economy. However, doing so in a rigorous fashion presents challenges, particularly with the modern breed of dynamic stochastic general equilibrium models. In recent work with Lee E. Ohanian, I have attempted to provide a constructive framework for assessing agreement between dynamic equilibrium models and data, which enables a complete comparison of model and data means, variances, and serial correlations.²³ The new methods use bootstrap algorithms to evaluate the significance of deviations between model and data without assuming that the model under investigation is correctly specified. They also use goodness-of-fit criteria to produce estimators that optimize economically relevant loss functions.

In related work, Lutz Kilian and I propose a measure of predictability based on the ratio of the expected loss of a short-run forecast to the expected loss of a long-run forecast.²⁴ The predictability measure can be tailored to the forecast horizons of interest, and it allows for general loss functions, univariate or multivariate information sets, and stationary or nonstationary data. We propose a simple estimator, and we suggest resampling methods for inference. We then put the new tools to work in macroeconomic environments. First, based on fitted parametric models, we assess the predictability of a variety of macroeconomic series. Second, we analyze the internal propagation mechanism of a standard dynamic macroeconomic model by comparing the predictability of model inputs and model outputs. Finally, we compare the predictability in U.S. macroeconomic data with that implied by leading macroeconomic models.

How can secular growth be distinguished from cyclical fluctuations? Understanding the difference between the economy's trend and its cycle is crucial for business cycle analysis. A long debate continues on the appropriate separation of trend and cycle; Abdelhak S. Senhadji and I have summarized recent elements in this debate and attempted to sift the relevant evidence.²⁵ In the end, a great deal of uncertainty remains; however, it appears that some traditional trend/cycle decompositions with quite steady trend growth are not bad approximations in practice.

If there is still uncertainty in disentangling trend from cycle, there is less in finding good cyclical forecasting models. In particular, the low power that plagues unit root tests and related procedures when testing against nearby alternatives, which are typically the relevant alternatives in macroeconomics and finance, is not necessarily a concern for forecasting. Ultimately, the question of interest for

forecasting is not whether unit root pretests select the "true" model, but whether they select models that produce superior forecasts. My recent work with Kilian suggests that unit root tests are effective when used for that purpose.²⁶

¹ J. H. Cochrane, "New Facts in Finance," NBER Working Paper No. 7169, June 1999, provides a fine survey of many of the recent developments in finance.

² The "Forecasting and Empirical Methods in Finance and Macroeconomics" group is supported by the NBER and the National Science Foundation. Its meetings have produced several associated symposiums, including those whose proceedings appear in: Review of Economics and Statistics, November 1999, F. X. Diebold, J. H. Stock, and K. D. West, eds.; International Economic Review, November 1998, F. X. Diebold and K. D. West, eds.; and Journal of Applied Econometrics, September–October 1996, F. X. Diebold and M. W. Watson, eds.

³ For overviews, see F. X. Diebold, Elements of Forecasting, Cincinnati: South-Western College Publishing, 1998, and "The Past, Present, and Future of Macroeconomic Forecasting," NBER Working Paper No. 6290, November 1997, and Journal of Economic Perspectives, 12 (1998), pp. 175–92.

⁴ See, for example, A. C. Stockman, "Economic Theory and Exchange Rate Forecasts," International Journal of Forecasting, 3 (1987), pp. 3–15.

⁵ P. F. Christoffersen and F. X. Diebold, "Optimal Prediction under Asymmetric Loss," NBER Technical Working Paper No. 167, October 1994. Published in two parts, as "Optimal Prediction under Asymmetric Loss," Econometric Theory, 13 (1997), pp. 808–17, and "Further Results on Forecasting and Model Selection under Asymmetric Loss," Journal of Applied Econometrics, 11 (1996), pp. 561–72.

⁶ P. F. Christoffersen and F. X. Diebold, "Cointegration and Long-Horizon Forecasting," NBER Technical Working Paper No. 217, October 1997, and Journal of Business and Economic Statistics, 16 (1998), pp. 450–8.

⁷ For a survey, see F. X. Diebold and J. A. Lopez, "Forecast Evaluation and Combination," NBER Technical Working Paper No. 192, March 1996, and Handbook of Statistics, G. S. Maddala and C. R. Rao, eds., pp. 241–68. Amsterdam: North-Holland, 1996.

⁸ F. X. Diebold and R. S. Mariano, "Comparing Predictive Accuracy," Journal of Business and Economic Statistics, 13 (1995), pp. 253–65, and in Economic Forecasting, T. C. Mills, ed., Cheltenham, U.K.: Edward Elgar Publishing, 1998.

⁹ K. D. West, "Asymptotic Inference about Predictive Ability," Econometrica, 64 (1996), pp. 1067–84.

¹⁰ H. White, "A Reality Check for Data Snooping," Econometrica, forthcoming, and R. Sullivan, A. Timmermann, and H. White, "Data Snooping, Technical Trading Rule Performance, and the Bootstrap," Journal of Finance, forthcoming.

¹¹ F. X. Diebold, T. A. Gunther, and A. S. Tay, "Evaluating Density Forecasts, with Applications to Financial Risk Management," NBER Technical Working Paper No. 215, October 1997, and International Economic Review, 39 (1998), pp. 863–83.

¹² F. X. Diebold, J. Hahn, and A. S. Tay, "Multivariate Density Forecast Evaluation and Calibration in Financial Risk Management: High-Frequency Returns on Foreign Exchange," revised and re-titled version of NBER Working Paper No. 6845, December 1998. Forthcoming in Review of Economics and Statistics, 81 (1999).

¹³ F. X. Diebold, A. S. Tay, and K. F. Wallis, "Evaluating Density Forecasts of Inflation: The Survey of Professional Forecasters," NBER Working Paper No. 6228, October 1997, and Cointegration, Causality, and Forecasting: A Festschrift in Honor of Clive W. J. Granger, R. Engle and H. White, eds., pp. 76–90. Oxford: Oxford University Press, 1999.

¹⁴ For an overview, see T. Andersen, T. Bollerslev, F. X. Diebold, and P. Labys, "Understanding, Optimizing, Using, and Forecasting Realized Volatility and Correlation," Risk, 12 (forthcoming).

¹⁵ See T. Andersen, T. Bollerslev, F. X. Diebold, and P. Labys, "The Distribution of Exchange Rate Volatility," NBER Working Paper No. 6961, February 1999, and the references therein.

¹⁶ See F. X. Diebold, A. Hickman, A. Inoue, and T. Schuermann, "Scale Models," Risk, 11 (1998), pp. 104–7, and Hedging with Trees: Advances in Pricing and Risk Managing Derivatives, M. Broadie and P. Glasserman, eds., pp. 233–7. London: Risk Publications, 1998.

¹⁷ 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 (forthcoming).

¹⁸ F. X. Diebold and A. Inoue, "Long

Memory and Structural Change," manuscript, Department of Finance, Stern School of Business, New York University, 1999.

¹⁹ F. X. Diebold and G. D. Rudebusch, "A Nonparametric Investigation of Duration Dependence in the American Business Cycle," Journal of Political Economy, 98 (1990), pp. 596–616; F. X. Diebold, D. Neumark, and D. Polsky, "Job Stability in the United States," Journal of Labor Economics, 15 (1997), pp. 206–33; and A. N. Bomfim and F. X. Diebold, "Bounded Rationality and Strategic Complementarity in a Macroeconomic Model: Policy Effects, Persistence, and Multipliers," Economic Journal, 107 (1997), pp. 1358–75.

²⁰ F. X. Diebold and G. D. Rudebusch, Business Cycles: Durations, Dynamics, and Forecasting. Princeton: Princeton University Press, 1999.

²¹ F. X. Diebold and G. D. Rudebusch, "Measuring Business Cycles: A Modern Perspective," Review of Economics and Statistics, 78 (1996), pp. 67–77; and F. X. Diebold, J.-H. Lee, and G. Weinbach, "Regime Switching with Time-Varying Transition Probabilities," in Nonstationary Time Series Analysis and Cointegration, C. Hargreaves, ed., pp. 283–302. Oxford: Oxford University Press, 1994.

²² C.-J. Kim and C. R. Nelson, "Business Cycle Turning Points, a New Coincident Index, and Tests of Duration Dependence Based on a Dynamic Factor Model with Regime-Switching," Review of Economics and Statistics, 80 (1998), pp. 188–201, and State Space Models with Regime Switching. Cambridge, Mass.: MIT Press, 1999.

²³ F. X. Diebold, L. E. Ohanian, and J. Berkowitz, "Dynamic Equilibrium Economies: A Framework for Comparing Models and Data," NBER Technical Working Paper No. 174, February 1995, and Review of Economic Studies, 65 (1998), pp. 433–52.

²⁴ F. X. Diebold and L. Kilian, "Measuring Predictability: Theory and Macroeconomic Applications," NBER Technical Working Paper No. 213, August 1997.

²⁵ F. X. Diebold and A. S. Senhadji, "The Uncertain Unit Root in Real GNP: Comment," American Economic Review, 86 (1996), pp. 1291–8.

²⁶ F. X. Diebold and L. Kilian, "Unit Root Tests Are Useful for Selecting Forecasting Models," NBER Working Paper No. 6928, February 1999, and forthcoming in Journal of Business and Economic Statistics, 18.

The Effects of Liability Rules on Medical Practice

Daniel P. Kessler*

Medical malpractice liability law has two principal objectives: to compensate patients who are injured through the negligence of health care providers, and to deter providers from practicing negligently. Considerable evidence indicates that the current liability system in the United States is not achieving its compensation goal. Awards for medical malpractice claimants are subject to lengthy delays: on average, it takes around four years to resolve a malpractice claim.¹ In addition, the current system is neither sensitive nor specific in its distribution of awards. Only 1 in 15 patients who suffer an injury because of medical negligence receives compensation, and five-sixths of the cases that receive compensation have no evidence of negligence.²

The unpredictability of malpractice compensation suggests that the system may not be achieving its second objective: to provide incentives for physicians to take optimal precautions against patient injury. Injury attributable to medical care generally, and to negligence specifically, is surprisingly common. Nearly 4 percent of hospital admissions in New York state in 1984 involved an injury that was attributable to medical care, with roughly one-quarter caused by negligence (the proportion of serious injuries that were attributable to negligence was even higher).³

At the same time, U.S. health spending has reached unprecedented levels, with no clear sign of slower

growth rates in sight. Does the malpractice system lead physicians to take too little care to avoid harming patients? Or does it lead to “defensive medicine”—costly precautionary treatments with minimal expected medical benefit administered out of fear of legal liability? Why has the liability system performed poorly in the health care sector? What policy reforms might improve the ability of the system to meet its twin goals? My research with Mark B. McClellan addresses these questions.

Why the Liability System Leads to Nonoptimal Health Care Decisions: Insurance

In theory, the liability system should provide physicians with incentives to take the socially optimal amount of care against accidental medical injury. Doctors bear the costs of injuries that they negligently cause. With their patients, they balance the costs of injuries against the costs of precautionary medical treatment and undertake those tests and procedures that are worthwhile from the perspective of social welfare.

But the pervasiveness of insurance in the health care sector drives a wedge between these seemingly sensible incentives and socially optimal medical decisionmaking. On the one hand, because physicians have insurance against the financial costs of malpractice that is not strongly experience-rated, they may bear little of the costs of medical injuries.⁴ This could lead physicians to take fewer precautions than the low costs of diagnostic tests, for example, would warrant. On the other hand, because most health care is financed through health insurance, patients and physicians bear little of the costs of pre-

cautionary medical care in any particular case. Generally, insured expenses for drugs, tests, and other services performed for precautionary purposes are much larger than the uninsured cost of the physician's own effort. Insensitivity to the true costs of health care could lead physicians to take socially excessive precautions against injury—to practice defensive medicine. Thus, even a perfectly functioning liability system could lead to socially undesirable medical treatment decisions—either too much or too little health care.

Do Doctors Practice Defensive Medicine?

The direction and extent of the divergence between the privately and socially optimal levels of precaution depend in part on states' medical malpractice liability laws. Although the basic “negligence rule”—which states that damages equal to the harm suffered should be awarded in cases of negligence—applies to most medical malpractice claims in the United States, individual states have modified their liability laws along various dimensions over the past 30 years. For example, several states have imposed caps on malpractice damages such that recoverable losses are limited to a fixed dollar amount, such as \$500,000. These modifications to the basic negligence rule can affect physician behavior by affecting the costs to physicians and the benefit to patients from a given malpractice claim or lawsuit, and the overall frequency of claims.⁵

To investigate whether liability law reforms lead to welfare-reducing or welfare-improving changes in medical treatment decisions, we analyzed longitudinal data from 1984, 1987, and 1990 on essentially all elderly Medicare beneficiaries hospitalized with serious cardiac illness, matched

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with information on reforms from the state in which the patient was treated.⁶ We studied the effect of reforms on total hospital expenditures on the patient in the year after the heart attack (AMI) or ischemic heart disease (IHD) as a way of measuring intensity of treatment. We also modeled the effect of reforms on important patient outcomes. We estimated the effect of reforms on a serious adverse outcome that is common in our study population: mortality within one year of occurrence of the cardiac illness. We also estimated the effect of reforms on two other common adverse outcomes related to a patient's quality of life: whether the patient experienced a subsequent AMI, or heart failure requiring hospitalization, in the year following the initial illness. Our basic strategy was to compare trends in treatments, costs, and outcomes for patients from states reforming their liability system with those from states that were not reforming their systems, holding constant patient background characteristics, state and time fixed effects, and the legal and political characteristics of states.

Our analysis indicates that reforms that directly limit liability—such as caps on damages—reduced hospital expenditures by 5 to 9 percent in the late 1980s. The effects were greater for the IHD than for the AMI patients. Because IHD is a less severe form of illness, the IHD patients may have had more “marginal” indications for intensive treatment, leading to a greater scope for defensive practices. In contrast, reforms that limit liability only indirectly were not associated with any substantial effects on expenditures. Neither type of reform led to any consequential differences in mortality or in the occurrence of serious complications. The estimated expenditure/benefit ratio associated with intensive treatment induced by liability pressure was more than \$500,000 per additional one-year sur-

vivor, with comparable ratios for recurrent AMIs and heart failure. Thus, treatment of elderly patients with heart disease does involve defensive medical practices, and limited reductions in liability can reduce this costly behavior.⁷

How Liability Law Affects Medical Productivity

Even if they improve productivity, direct reforms only address the problem of excessive physician precaution. Other reforms have sought to resolve a greater number of claims outside of formal litigation—the goal being to improve the sensitivity and specificity of malpractice compensation and to reduce the prevalence of defensive medicine.⁸ More fundamental changes in the liability system have also been proposed,⁹ although few of these changes have been broadly implemented. In addition, the rise of managed care in the 1990s, by reducing moral hazard from health insurance, may have affected the relationship between reforms and defensive practices; without this moral hazard, it is unlikely that defensive medicine would be an important social problem.

Predicting whether untried reforms, or existing reforms under new market conditions, will improve the performance of the liability system requires an understanding of the channels through which malpractice laws affect physician behavior. But my 1996 work with McClellan (as well as much of the work to date on program evaluations in other contexts) treats the mechanisms through which the effects of laws are achieved as a black box. This approach is simple, in that it avoids explicit empirical modeling of the key behavioral responses that actually lead to the outcomes of interest. However, without explicit models of policy effects on incentives, and in turn of the effects

of incentives on behavior, moving beyond the details of a particular reform to consider the likely consequences of other types of policy changes is highly speculative. Moreover, an explicit analysis of mechanisms could provide important validating information. Economic studies of policy effects are generally based on observational data, raising concerns that unmeasured factors rather than the policy changes themselves could account for the empirical results. Finally, explicit analysis of mechanisms provides a much richer context for modeling economic behavior; especially in the health care industry, provider behavior is not well understood.

My recent work empirically identifies these mechanisms. McClellan and I¹⁰ integrate four unique data sources to illuminate how existing liability law and liability reforms affect the outcomes of the liability system, and how reform-induced changes in the incentives provided by the liability system affect treatment decisions, medical costs, and health outcomes. We match by state and year the longitudinal Medicare data discussed earlier (updated to include all years from 1984 to 1994) with data on law reforms, with physician-level data on the frequency of malpractice claims from the American Medical Association's Socioeconomic Monitoring System (AMA SMS), and with malpractice claim-level data from the Physician Insurers Association of America on claim costs and claim outcomes.

We model the complete process by which malpractice reforms affect health care productivity. First we study the impact of liability reforms on a range of measures of the pressures on providers generated by the malpractice system: the frequency of malpractice claims, the likelihood of a prolonged duration of claims resolution, administrative and legal expenses incurred in defending against

a claim, and the amount of any settlement or award to the plaintiff. We then analyze the extent to which changes in malpractice pressure affect the major categories of medical treatment decisions for elderly heart disease patients, and in turn the consequences of these changes in practices for medical expenditures and patient health outcomes. We thus remove the black box by identifying the actual incentives that policy reforms alter to influence the production of medical services, and how these changes in medical production affect health and cost outcomes.

Although we find that direct reforms improve medical productivity primarily by reducing malpractice claims rates and compensation conditional on a claim, our results suggest that other policies that reduce the time spent and the amount of conflict involved in defending against a claim can also reduce defensive practices substantially. In addition, we find that "malpractice pressure" has a larger impact on diagnostic rather than therapeutic treatment decisions. Our results provide an empirical foundation for simulating the effects of untried malpractice reforms on health care costs and outcomes, based on their predicted effects on the malpractice pressure facing medical providers. For example, at least for elderly heart disease patients, an untried reform that reduced the legal-defense burden on physicians and hospitals by one-quarter—which is within the range of policy possibilities—could be expected to reduce medical treatment intensity by approximately 6 percent, but not to increase the incidence of adverse health outcomes. In the same population, a policy that expedited claim resolution by six months across the board could be expected to reduce hospital treatment costs by 2.8 percent, without greater adverse outcomes.

My other work with McClellan tests specific hypotheses about the ways

in which liability law affects medical practices. We match longitudinal Medicare data with law reforms and data on health insurance markets to explore the ways in which managed care and liability reform interact to affect treatment intensity and health outcomes.¹¹ Have more parsimonious practices associated with managed care reduced physicians' incentive and ability to engage in defensive treatment, making the policy question about liability reform moot? Has managed care increased the benefits from liability reform? Or has managed care made liability reform socially harmful? In addition to contributing to our understanding of the effects of liability reforms in general, the answers to these questions can inform the debate over the extension of malpractice liability to health insurers and managed care organizations.

We find that direct reforms reduce defensive practices in areas with both low and high levels of managed care enrollment. Managed care and direct reforms do not have long-run interaction effects that are harmful to patient health. However, at least for patients with less severe cardiac illness, managed care and direct reforms are substitutes, so the reduction in defensive practices that can be achieved with direct reforms is smaller in areas with high managed care enrollment.

In our 1997 work,¹² McClellan and I use physician survey data from the AMA SMS to measure how malpractice pressure affects physician perceptions of appropriate practices. In that way, we capture a determinant of treatment decisions. We find that both liability reforms and individual physicians' personal experiences with the malpractice system are important determinants of the perceived importance of defensive medicine. Physicians from states adopting liability reforms report significant relative declines in the perceived impact of malpractice pressure on practice pat-

terns, as compared with physicians from nonadopting states. Physicians who have had a malpractice claim filed against them, particularly a recent claim, are more likely to report changes in practices as a result of malpractice pressure than physicians who have not. Furthermore, the effect of claims experience on perceptions is smaller in adopting versus nonadopting states. Taken together, these results suggest that reforms in law do affect physicians' attitudes, both by reducing the probability of an encounter with the liability system and by changing the nature of the experience of being sued, for those physicians who defend against malpractice claims.

Conclusion

My work with McClellan concludes that defensive medicine is an important problem in the U.S. health care system, and that limited reductions in liability can reduce the social costs of defensive practices. In future work, we will investigate how much our results can be generalized. How does liability reform affect treatment decisions in nonelderly populations, and does it affect different types of elderly patients (for example, men versus women) differently? We are also conducting additional analysis of physician surveys to explore the validity of our results. Questions designed exclusively for this project (administered as part of the 1998 AMA SMS) asked physicians detailed questions about their experiences with the malpractice system and their market environment, in order to identify how malpractice pressure and other incentives interact to affect medical decisionmaking.

¹ F. A. Sloan, P. B. Githerns, E. W. Clayton, G. B. Hickson, D. A. Gentile, and D. F. Partlett, *Suing for Medical Malpractice*, Table 2.4. Chicago: University of Chicago Press, 1993.

² *Harvard Medical Practice Study*, Patients, Doctors, and Lawyers: Medical

Injury, Malpractice Litigation, and Patient Compensation in New York, Cambridge, Mass.: *The President and Fellows of Harvard College*, 1990; P.C. Weiler et al., *A Measure of Malpractice: Medical Injury, Malpractice Litigation, and Patient Compensation*, p. 139. Cambridge, Mass.: Harvard University Press, 1993.

³ Weiler et al., *A Measure of Malpractice*, p. 137.

⁴ F. A. Sloan, "Experience Rating: Does It Make Sense for Medical Malpractice Insurance?" *American Economic Review*, 80 (1990), pp. 128–33. However, physicians bear significant uninsured expenses in response to a malpractice claim, such as the value of time and emotional energy spent on legal defense (U.S. Congress, Office of Technology Assessment, *Impact of Legal Reforms on Medical Malpractice Costs*, OTA-BP-H-119, p. 7. Washington, D.C.: U.S. Government Printing Office, 1993).

⁵ P. M. Danzon, *Medical Malpractice: Theory, Evidence, and Public Policy*. Cambridge, Mass.: Harvard University Press, 1985; D. P. Kessler and M. B. McClellan, "The Effects of Malpractice Pressure and Liability Reforms on Physicians' Perceptions of Medical Care," NBER Working Paper No. 6346, January 1998, and *Law and Contemporary Problems*, 60 (1997), pp. 81–106.

⁶ D. P. Kessler and M. B. McClellan, "Do Doctors Practice Defensive Medicine?" NBER Working Paper No. 5466, February 1996, published in *Quarterly Journal of Economics*, 111 (1996), pp. 356–90.

⁷ Recent work confirms that defensive practices exist in nonelderly populations. See, for example, L. Dubay, R. Kaestner, and T. Waidmann, "The Impact of Malpractice Fears on Cesarean Section Rates," *Journal of Health Economics*, 18 (1999), pp. 491–522.

⁸ R. R. Bovbjerg, "Legislation on Medical Malpractice: Further Developments and a Preliminary Report Card," *University of California, Davis, Law Review*, 22 (1989), pp. 499–556.

⁹ E. D. Kinney, "Malpractice Reform in the 1990s: Past Disappointments, Future Success?" *Journal of Health Politics, Policy, and Law*, 20 (1995), pp. 99–135.

¹⁰ D. P. Kessler and M. B. McClellan, "How Liability Law Affects Medical Productivity," NBER Working Paper No. 7533, February 2000.

¹¹ D. P. Kessler and M. B. McClellan, "Medical Liability, Managed Care, and Defensive Medicine," NBER Working Paper No. 7537, February 2000.

¹² Kessler and McClellan, "The Effects of Malpractice Pressure and Liability Reforms."

International Economic Organizations, Developing Country Reforms, and Trade

Anne O. Krueger*

International Economic Organizations

The three major international economic organizations are the World Bank, the International Monetary Fund (IMF), and the World Trade Organization (WTO). The WTO emerged out of the General Agreement on Tariffs and Trade (GATT) in 1995; it is an arrangement across countries that serves as a forum for negotiations on trading rules as well as a mechanism for dispute settlements in trade issues.¹ By contrast, the World Bank and IMF deal with

their member countries one at a time. They have little influence with industrial countries but can affect developing countries during times of economic crisis and when those countries seek additional foreign exchange resources. The origins and evolution of the three organizations are of considerable interest.² Perhaps even more important in light of the recent financial crises in Mexico, East Asia, and a few other countries, are the questions that arise about the current and future roles of the IMF and the World Bank.³

These questions cover a broad set of issues. A healthy open trading system is crucial for the progress of the international economy. It is particularly important in providing an environment in which developing countries can successfully reform their policies and achieve rapid economic growth and rising living standards for

all. I have been particularly interested in the relationship between preferential trading arrangements, such as the North American Free Trade Agreement (NAFTA), and the WTO.⁴ The issue is simple: the WTO is based on the principle of open, nondiscriminatory trade among its members, while preferential trading arrangements are, by their nature, discriminatory. Under NAFTA, for example, goods originating in Mexico and Canada are not subject to duties when they enter the United States, yet the same goods from other countries are subject to U.S. duties. Assuring that preferential trading arrangements will not block progress in multilateral liberalization is important, and I am now completing a paper in which I analyze how much discrimination has been a factor under the first three years of NAFTA.

My other major concern regarding

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international economic organizations is closely related to the subject of developing countries' economic policy reforms. I want to know what the current and future roles of the World Bank and IMF will be in economic policy reform in developing countries. In the case of the World Bank, for example, to what extent will the Bank need to focus its resources on poor countries and the support of economic policy reforms, as opposed to tackling "new issues," such as gender and ethnicity (including treatment of minorities). Both the Bank and the IMF have been criticized by many in light of the Asian financial crises of 1997 and 1998.

Economic Policy Reforms

That takes me immediately to my second set of issues of concern: the choice of exchange rate regime and its relationship to economic growth and the avoidance of crisis. Even before 1994 there was cause for concern about Mexico and other countries that adopted "nominal anchor" exchange rate policies: they deliberately kept their exchange rates from depreciating as rapidly as would have been warranted on the basis of the inflation differential between themselves and the rest of the world. These regimes enabled foreigners to invest very profitably in local markets (because they received the domestic interest rate and could convert it into their own currencies at the appreciated exchange rate) until investors realized that the debt-servicing obligations that were accumulating were too heavy.⁵

Moreover, as long as foreigners were willing to lend and invest, domestic credit could increase in these countries without strong inflationary pressures: the lending financed an excess of imports over exports. Investors appear to have been fooled: they did not observe fis-

cal deficits, but they also failed to recognize that under these exchange rate regimes, rapid expansion of domestic credit was equivalent to increasing the contingent liabilities of the government, with the same long-run implications for sustainability unless capital inflows financed highly productive investments.

An increasing body of evidence suggests that efforts to maintain nominal anchor exchange rates are very likely to be unsustainable: the appropriate exchange rate regime is probably either floating rates or one in which the currency is permanently and irrevocably tied to a major foreign currency.

Indeed, the rapid expansion of domestic credit in many countries meant that banks did not have an adequate staff of trained personnel who could appropriately evaluate the credit risks of their borrowers. As a result, nonperforming loans built up in the domestic banking systems and weakened the banking structure. Then, when the exchange rate regime was abandoned, the dollar- (or yen- or Deutsch mark-) denominated liabilities of domestic borrowers increased the difficulty with debt servicing, and threatened a major crisis in the domestic banking system.

One of the questions that has arisen as we are better understanding the events of 1997-8 (and the earlier Mexican difficulties) is: what are the appropriate reforms for financial systems so that banks will have improved incentives (attributable mostly to increased capital adequacy standards) and will operate in a regulatory framework that prevents the build-up of nonperforming loans (whose magnitude is further increased when devaluation must follow the end of the nominal anchor exchange rate regime)? Aaron Tornell and I⁶ have analyzed the evolution of nonperforming loans in the Mexican banking system and the ways in which Mexico's policy responses to

the 1994-5 crisis enabled rapid recovery but failed to resolve some of the longer-term issues associated with restoring the health of the banks. The problem for policymakers is that recovery from crisis cannot occur until the banks are restored to health: that means that nonperforming loans must be removed from the banks' portfolios (as happened in Mexico).⁷ But that must be done in ways that prevent a repetition of the build-up of nonperforming loans. Finding an appropriate mix of policy instruments is challenging, and many researchers continue to investigate this topic.

An interesting and related question is how the charges of "cronyism" relate to the other issues that have arisen in the East Asian crisis. I am currently studying the parallels between state-directed lending by banks to cronies under "crony capitalism" and public-sector deficits of state economic enterprises under more state-led development. The parallels are interesting and instructive: if cronies can be assured of access to bank credit, their budget constraints are "soft," just as are those of state-owned enterprises when their losses are automatically covered from the government's budget. And, for the same reason, each type of enterprise is likely to realize lower rates of return on investments than when there is a "hard" budget constraint.

Likewise, for state enterprises politicians normally select managers whose talents and skills lie elsewhere. Cronies are equally likely to not be the most qualified and trained managers. In each instance, there is likely to be a lack of competition (or an unfair playing field) that further reduces pressures for economically efficient production. In both instances, import barriers are likely to be used to assist domestic firms. In the case of crony capitalism, access to credit on favorable terms and other government favors can insulate

enterprises from competitive pressures. I am currently estimating real rates of return on investments in the various financial-crisis countries; preliminary data indicate that real rates of return fell dramatically for several decades as the relative importance of the crony-run enterprises increased.

U.S. Trade Policy

The final area of research in which I have been involved in recent years is U.S. trade policy. The United States is so important in the world economy that its policies affect the functioning of the international economic system with at least as much force as does the WTO and other international economic organizations. Many aspects of U.S. trade policy are conducive to the efficient functioning of the international trading system, but there are questionable practices, too. While these practices clearly hurt U.S. consumers and producers, they have broader ramifications for the international economy because of the American leadership role. Particularly worrisome are American practices with respect to antidumping and countervailing duties: the law and the procedures followed in these cases bear little resemblance to the economist's case against predatory pricing.⁸ Many other countries are now imitating American practices, and there is a serious risk that many of the gains achieved in liberalizing world trade under GATT and the WTO will be eroded as more and more countries resort to antidumping measures and procedures that penalize trade even when predatory pricing is not involved.

EASE

All of these issues arise in connection with relations between East Asian countries and the United States. For the past ten years, Takatoshi Ito and I have been codirectors of the NBER's East Asian Seminar on Economics. Each year a conference has been held on a subject relating to mutual interdependence. Authors have then revised their papers based on discussion at the conference, and we have produced a volume published for the NBER by the University of Chicago. Cosponsoring institutions are the Chung-Hwa Institution for Economic Research in Taipei, the Japan Economic Research Center,⁹ the Korea Development Institute, and the Hong Kong University of Science and Technology. The five cosponsors have rotated being the local host, while the NBER has maintained a lead role in supporting the logistics of the conference and in preparing the results for publication. The subject of the 1998 conference in Osaka was the microeconomic aspects of direct foreign investment. That volume is in press. The subject of the 1999 conference, hosted by the NBER in Hawaii, was macroeconomic aspects of direct foreign investment. The 2000 conference, to be held in Seoul, will have trade in services as its theme. Each seminar has proved highly stimulating in illuminating the many similarities that arise across the economies of East Asia and the United States. Researchers from the participating countries also benefit from the additional insights they achieve when contrasting the

circumstances in their own countries with those of others.

¹ See The WTO as an International Organization, A. O. Krueger, ed. Chicago: University of Chicago Press, 1998.

² See A. O. Krueger, "The Founding of the Bretton Woods Institutions: A View from the 1990s," in *The Political Economy of Comparative Development into the 21st Century*, G. Ranis, S.-C. Hu, and Y.-P. Chu, eds., pp. 335-4. Cheltenham, U.K.: Edward Elgar Publishing, 1999.

³ See A. O. Krueger, "Whither the World Bank and the IMF?" *Journal of Economic Literature*, 4 (December 1998), pp. 1983-2020.

⁴ A. O. Krueger, "Free Trade Agreements versus Customs Unions," *Journal of Development Economics*, 54 (October 1997), pp. 169-87.

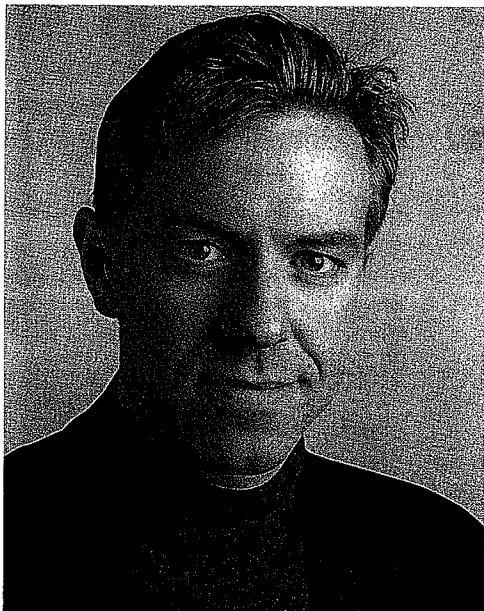
⁵ A. O. Krueger, "Nominal Anchor Exchange Rate Policies as a Domestic Distortion," in *Development, Duality, and the International Economic Regime*, G. Saxonhouse and T. N. Srinivasan, eds., pp. 375-97. Ann Arbor: University of Michigan Press, 1999.

⁶ A. O. Krueger and A. Tornell, "The Role of Bank Restructuring in Recovering from Crises: Mexico, 1995-8," NBER Working Paper No. 7042, March 1999.

⁷ A strong case can be made that it was the failure of the Japanese government to address the problem of nonperforming loans in the banking system early in the 1990s that led to a significant barrier to resumption of economic growth.

⁸ See my *American Trade Policy: A Tragedy in the Making* (Washington, D.C.: Brookings Institution, 1995) and the NBER volume I edited, *The Political Economy of American Trade Policy* (Chicago: University of Chicago Press, 1996).

⁹ We have received generous support from the Center for Global Partnership of the Japan Foundation for the past two NBER East Asian Seminars on Economics.



NBER Profile: *Geert Bekaert*

Geert Bekaert is a Research Associate in the NBER's Program on Asset Pricing and a professor of finance at Columbia University's business school. He is on leave from Stanford University's Graduate School of Business.

Bekaert received his B.A. from the University of Ghent in 1986 and his Ph.D. in economics from Northwestern University in 1992. Before entering graduate school, he worked in the Research Department of the Kredietbank in Belgium (1986–7). He has also been a Visiting Professor at the Universities of Tilburg, Maastricht, and Ghent.

Bekaert's research focus is international finance, particularly foreign exchange market efficiency, exchange rate and interest rate deter-

mination, and international equity markets. He has been involved in several projects on emerging equity markets, sponsored by the World Bank, the Catalyst Institute, and the Davidson Institute. He is an Associate Editor of *Emerging Markets Quarterly*, the *Journal of Financial and Quantitative Analysis*, and the *Pacific-Basin Finance Journal*. He is also Coeditor of the *Journal of Empirical Finance*.

Bekaert lives in Manhattan with his wife, Ann, and their three daughters, Laura, Britt, and Emma. While not writing papers or preparing referee reports, he enjoys playing basketball, listening to alternative music (from Joy Division to David Sylvian), and spending time with his "wonderfully feminine family."

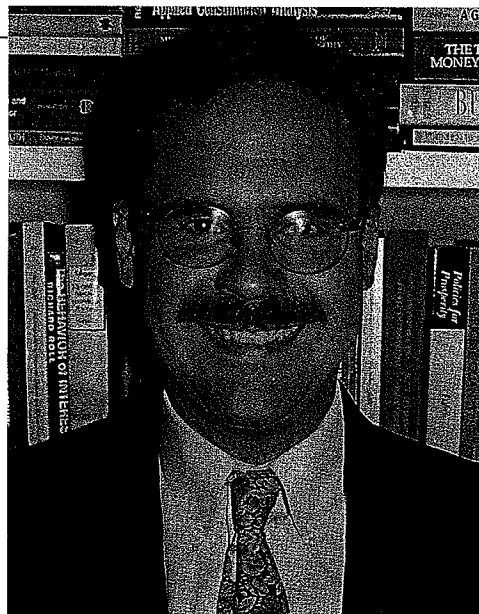
NBER Profile: *Francis X. Diebold*

Francis X. Diebold is a Research Associate in the NBER's Program on Asset Pricing. He is the Armellino Visiting Professor of Finance at New York University's Stern School of Business, and the Lawrence R. Klein Professor of Economics and Statistics and Director of the Institute for Economic Research at the University of Pennsylvania.

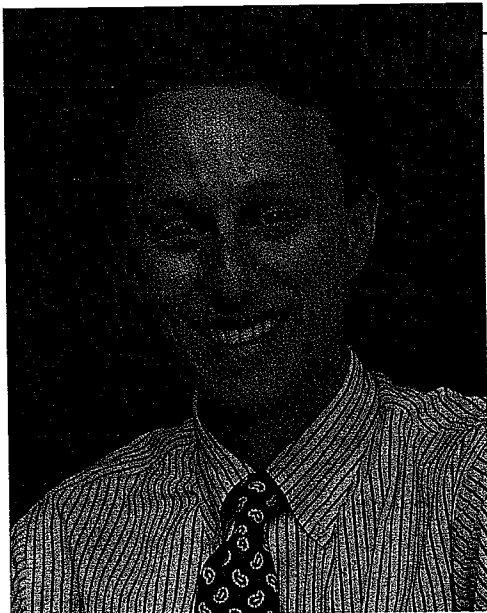
Diebold received his B.S. from the Wharton School in 1981 and his Ph.D. from the University of Pennsylvania in 1986. From 1986 to 1989 he was an economist at the Board of Governors of the Federal Reserve System in Washington, D.C., after which he returned to the University of Pennsylvania.

Diebold works in financial econometrics, forecasting, and empirical macroeconomics. His work has been published widely and he has served on the editorial boards of leading journals, including *Econometrica*, the *Review of Economics and Statistics*, and the *International Economic Review*. He is a Fellow of the Econometric Society, as well as a two-time recipient of the University of Pennsylvania's Kravis Prize for Outstanding Teaching.

Diebold and his wife, Susan, live in suburban Philadelphia with their three children: Hannah, 11; Frankie, 10; and Gillian, 1. He enjoys travel, wine, and hiking with his family.



NBER Profile: *Daniel P. Kessler*



Daniel P. Kessler is a Research Associate in the NBER's Programs on Health Care and Law and Economics. He is also an associate professor at the Stanford University Graduate School of Business, a Research Fellow at the Hoover Institution, and an associate at the Center for Health Policy at Stanford.

Kessler received a B.A. in economics from Harvard University, a J.D. from Stanford Law School, and a Ph.D. in economics from MIT. He has taught at the Stanford Business School since 1994. Among his research interests are the empirical

investigation of the effects of legal and regulatory policy on economic decisionmaking, particularly in the health care field. His work has been featured in economics journals, law reviews, and general-interest publications such as the *Wall Street Journal* and *BusinessWeek*. His recent work investigates the impact of hospital competition and hospital ownership status on medical treatment decisions, health care costs, and patient health outcomes.

Kessler lives in Portola Valley, California, with his wife, Karen Jacobson.

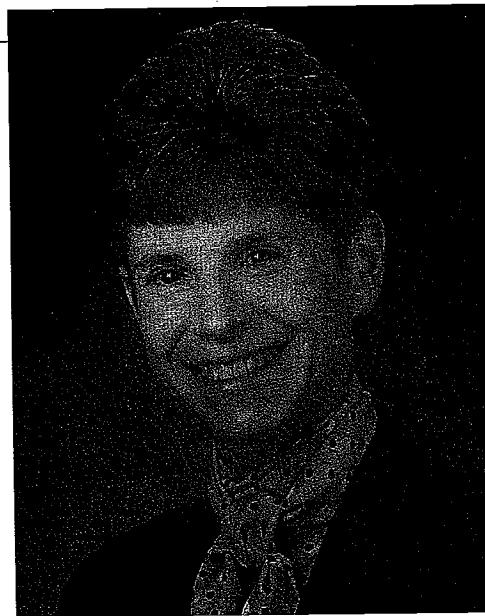
NBER Profile: *Judy C. Lewent*

Judy C. Lewent, a newly elected Director of the NBER, is Senior Vice President and Chief Financial Officer of Merck & Co., Inc. She is responsible for worldwide financial, corporate, and human health business development matters, as well as for Merck's current joint venture relationships with Johnson & Johnson and Rhone-Poulenc.

Lewent earned a B.S. in economics from Goucher College and an

M.S. in management from MIT's Sloan School of Management. She joined Merck in 1980, rising through its management ranks to her current position in December 1992.

Lewent is a member of the Board of Directors of Motorola and Quaker Oats, a Trustee of the Rockefeller Family Trust, a member of the MIT Corporation, and a member of the University of Pennsylvania Health System Trustee Board.



NBER Profile: *Richard D. Rippe*



Richard D. Rippe was recently elected a member of the NBER's Board of Directors representing the National Association for Business Economics. He is a Senior Vice President and Chief Economist of Prudential Securities Incorporated. He joined the firm in 1991.

Rippe received his A.B. degree in economics from Harvard College and his Ph.D. in Business Economics from Harvard University. He taught at Columbia University's Graduate

School of Business and was Chief Economist at Dean Witter Reynolds, Inc. before joining Prudential. Rippe is a past President of the National Association for Business Economics and a past Chairman of the Conference of Business Economists.

Rippe and his wife, Sandy, reside in Manhattan with their three children. In their leisure time, the whole family makes gallant attempts to play tennis and golf and to ski.

NBER Profile: *Martin B. Zimmerman*

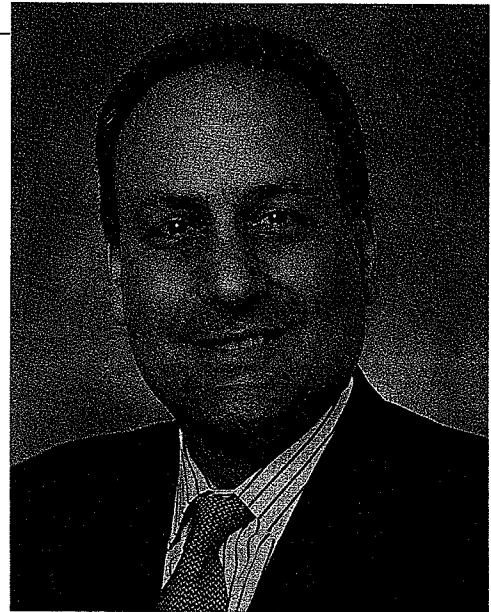
Martin B. Zimmerman, a new director-at-large of the National Bureau of Economic Research, has been vice president—governmental affairs of the Ford Motor Corporation since January 1, 1999. Zimmerman joined Ford in August 1987 as the company's chief economist. In January 1994, he was promoted to executive director, Governmental Relations and Corporate Economics.

Born in New York City, Zimmerman received a bachelor's degree from Dartmouth College and a Ph.D. in economics from MIT. He was a faculty member in the Sloan School

of Management at MIT before joining the faculty of the University of Michigan's Graduate School of Business Administration in 1983. He became chairman of business economics in 1985.

He interrupted that assignment to serve as Senior Economist on the President's Council of Economic Advisers, from September 1985 to September 1986. In 1997, Zimmerman received the Blue Chip Economic Forecasting Award for the most accurate forecast over the 1992–6 period.

He resides in Ann Arbor, Michigan.



Conferences

The Distributional Effects of Social Security Reform

An NBER conference on "The Distributional Effects of Social Security Reform," organized by NBER President Martin S. Feldstein and Faculty Research Fellow Jeffrey B. Liebman, both of Harvard University, was held on October 22 and 23. The following papers were discussed:

Jeffrey Liebman, "Redistribution in the Current U.S. Social Security System"

Discussant: Gary Burtless, Brookings Institution

Angus S. Deaton, **Pierre-Olivier Gourinchas**, and **Christina Paxson**, NBER and Princeton University, "Social Security and Inequality over the Life Cycle"

Discussant: James Poterba, NBER and MIT

Jagadeesh Gokhale, Federal Reserve Bank of Cleveland, and **Laurence J. Kotlikoff**, NBER and Boston University, "Social Security's Treatment of Postwar Americans: How Bad Can It Get?" (NBER Working Paper No. 7362)

Discussant: David A. Wise, NBER and Harvard University

Julia Lynn Coronado, Federal Reserve Board of Governors; **Don Fullerton**, NBER and University of Texas at Austin; and **Thomas Glass**, Glass & Company, "Long-Run Effects of Social Security Reform Proposals on Lifetime Progressivity"

Discussant: Steven Goss, Social Security Administration

Martin S. Feldstein and **Jeffrey B. Liebman**, "The Distributional Effects of an Investment-Based Social Security System" (NBER Working Paper No. 7492)

Discussant: John B. Shoven, NBER and Stanford University

Laurence J. Kotlikoff; **Kent Smetters**, University of Pennsylvania; and **Jan Walliser**, International Monetary Fund, "Distributional Effects in a General Equilibrium Analysis of Social Security"

Discussant: David Wilcox, U.S.

Department of the Treasury

Kathleen McGarry, NBER and University of California, Los Angeles, "Guaranteed Income: SSI and the Well-Being of the Elderly Poor"

Discussant: Bruce D. Meyer, NBER and Northwestern University

Jagadeesh Gokhale and **Laurence J. Kotlikoff**, "The Impact of Social Security and Other Factors on the Distribution of Wealth"

Discussant: R. Glenn Hubbard, NBER and Columbia University

Martin Feldstein and **Elena Rangelova**, Harvard University, "The Economics of Bequests in Pensions and Social Security" (NBER Working Paper No. 7065)

Discussant: Jonathan S. Skinner, NBER and Dartmouth College

Jeffrey R. Brown, NBER Harvard University, "Differential Mortality and the Value of Individual Account Retirement Annuities"

Discussant: Andrew Samwick, NBER and Dartmouth College

Using microdata on the lifetime earnings and benefits of two cohorts of workers, **Liebman** finds that spouse benefits and differential mortality greatly reduce the progressivity of the current U.S. Social Security system. While net transfers tend to fall as lifetime income rises, transfers received at a given income level vary widely, suggesting that Social Security is a relatively imprecise way of redistributing based on lifetime income. Results for the younger cohort show that greater female labor-force participation will increase the progressivity of the system by reducing the role of spouse benefits. However, declines in marriage and increases in divorce

will lead to an increase in the share of women who reach retirement without entitlement to benefits based on a husband's earnings record and who therefore will be at high risk of poverty.

Social insurance arrangements affect how risk is pooled among individuals in the economy. Different people receive different earnings and yields on their portfolios, and some of these differences have cumulative effects over time. In that way, inequality among people of the same age widens as the group ages. However, the rate at which inequality increases and the average inequality over the life cycle are moderated by

social insurance arrangements, including the current Social Security system. Moving to a system that relies more on individual accounts and less on a common pool reduces risk sharing and thus will increase the rate at which inequality increases with age and the average inequality experienced by each age group. **Deaton**, **Gourinchas**, and **Paxson** illustrate these ideas using standard models of life-cycle consumption and saving. Their simulations show an average increase over the life cycle of 5 to 6 points in the Gini coefficient of consumption that is associated with a move from a completely pooled social security system to one in which

all contributions are invested in individual accounts. Such an increase is large when compared with historical variations in consumption inequality in the United States.

Gokhale and Kotlikoff note how the current U.S. Social Security system is a bad deal for postwar Americans. Of every dollar postwar Americans have earned or will earn over their lifetimes, more than 5 cents will be lost to the Old Age Survivor Insurance (OASI) system in the form of payroll taxes paid in excess of benefits received. This lifetime net tax rate also can be understood by comparing the rate of return that postwar contributors receive from the OASI versus the return they could earn on the market. The OASI return—1.86 percent—is less than half the return currently being paid on inflation-indexed long-term government bonds, and the OASI return is much riskier. Further, since Social Security faces a staggering and long-term funding problem, the treatment of postwar Americans can get even worse once adjustments are made to “save” the system.

Coronado, Fullerton, and Glass use a large sample of diverse individuals from the Panel Study of Income Dynamics to calculate lifetime income, to classify individuals into income quintiles, and then to calculate the present value of taxes minus benefits for each person in each group. The authors find that, overall, the current system is slightly progressive on a lifetime basis. Social Security would become slightly more progressive in one of the proposed reform plans, and it would become slightly regressive in each of the other proposed plans. None of these reforms greatly alters the current degree of progressivity on a lifetime basis, though.

Feldstein and Liebman study the distributional impact of a change from the existing pay-as-you-go Social Security system to one that combines both pay-as-you-go and

investment-based elements. Using individual-level data that permit them to analyze the full distribution of the benefits that individuals would receive under the two different systems, the authors find that most people in virtually all demographic groups would receive higher average benefits under a mixed system with an investment-based component than under current Social Security rules. Further, a smaller share of individuals would have benefits below the poverty line, even though the total cost of funding the mixed system—a 3 percent saving contribution rather than a 6 percent rise in the tax rate—is substantially lower than that of funding the pay-as-you-go system. These basic conclusions remain true even if the future rate of return in the investment-based component of the mixed system is substantially less than past experience implies.

Kotlikoff, Smetters, and Walliser review their model of the distributional effects of Social Security and reach six conclusions. First, privatization of Social Security can substantially raise long-run living standards, but this will take considerable time and will entail some welfare losses to transition generations. Second, privatization will help the poor even without any explicit redistribution mechanism. This reflects both the opportunity cost of the current pay-as-you-go system and the impact of privatization on capital deepening. Third, privatizations that feature voluntary rather than compulsory exit from the old system have particularly low transition costs and particularly favorable macroeconomic and distributional consequences. Fourth, privatizations that provide a flat (minimum) benefit can actually make the poor worse off than privatizations without a flat benefit. Fifth, combining privatization with a progressive match to contributions benefits the lifetime poor relative to privatization without a match. Finally, when the aging of America’s population is con-

sidered, the long-run gains from privatization of Social Security are greater because the status quo alternative entails a substantial long-run increase in the rate of payroll taxation.

Under the current Social Security system, the financial needs of the poor elderly are met by the Supplemental Security Income (SSI) program. SSI has done much to improve the situation of the poorest elderly, but, surprisingly, many of those eligible for benefits are not enrolled in the program. **McGarry** studies participation in SSI for a sample of eligible individuals and uses her results to simulate the effect of changes in eligibility criteria on participation and costs. She finds that providing an income guarantee for elderly individuals that is equal to the poverty line would increase outlays directed toward the elderly by 83 percent (or \$3.6 billion based on 1997 payments). Although large, this figure represents just 12.4 percent of total SSI expenditures when payments to the blind and disabled are included. Modifications to SSI that increase income that is disregarded, eliminate the asset test, or base income eligibility solely on Social Security income would be less costly but would have substantially greater effects on poverty if participation rates were increased.

Gokhale and Kotlikoff seek to determine how Social Security and other factors affect wealth inequality. They use synthetic data generated by CORSIM, a micro simulation model, in conjunction with cross-sectional earnings data from the Survey of Consumer Finances (SCF) to calibrate the distribution of lifetime labor earnings. Their simulated distribution of the wealth of those at retirement age closely matches that observed in the SCF—particularly so for those at the top of the wealth distribution curve. The authors also point out that Social Security, in differentially disenfranchising the children of the poor from receiving substantial inheritances, plays a significant role in exacerbat-

ing wealth inequality.

Experience in private pension plans and recent policy discussions about investment-based reforms of Social Security suggest that some form of bequest is likely to be part of any such reform that is enacted. **Feldstein** and **Ranguelova** examine the potential magnitudes of such bequests and their effect on retirement annuities and asset accumulation. The most likely form of bequest, the pre-retirement bequest, which is made when an employee dies before the normal retirement age, reduces the funds available for post-retirement annuities by about 16 percent or, equivalently, requires a one-sixth increase in the Personal Retirement Account (PRA) saving rate to maintain the same level of post-retirement annuities. The least costly post-retirement bequest option that the authors consider is adding a 10-year-certain feature to the life annuity, thereby providing a bequest whenever the retiree dies before age 77. This would reduce annuities, relative to providing only pre-retirement bequests, by

about 6 percent. The most costly option the authors consider would provide a bequest equal to the remaining actuarial value of the PRA annuity at the time of death and would require reducing all annuities by about 23 percent unless the PRA saving rate is raised.

Brown examines the extent of financial redistribution that would occur under various annuity and bequest options as part of an individual accounts retirement program. He first estimates mortality differentials by gender, race, ethnicity, and education level using the National Longitudinal Mortality Study. He then uses these estimates to examine the "expected transfers" that would take place between socioeconomic groups under different assumptions about the structure of an annuity program. Using an expected present discounted value or "money's worth" calculation as the basis for comparison, Brown finds that the size of transfers in an individual accounts program is highly sensitive to the benefit structure. Mandating a single-

life, real annuity can result in expected transfers of as much as 16 percent of the account balance, often from economically disadvantaged groups (such as black males who have less than a high school education) and toward groups that are better off (such as college-educated whites). These transfers can be substantially reduced through the use of joint life annuities, survivor provisions, and bequest options. The largest expected negative transfer under a joint and full survivor annuity with a fully valued 20-year guarantee option is less than 2 percent of the account balance. However, efforts to reduce the extent of redistribution generally do so at the cost of significantly lower annuity benefits paid to the individuals who contribute to the system.

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

Tax Policy and the Economy

The NBER held its Fourteenth Annual Conference on "Tax Policy and the Economy" in Washington on November 2. Organizer James M. Poterba, NBER and MIT, selected these papers for the program.

Brian J. Hall and **Jeffrey B. Liebman**, NBER and Harvard University, "The Taxation of Executive Compensation"

Douglas A. Shackelford, NBER and University of North Carolina, Chapel Hill, "Stock Market Reaction

to Capital Gains Tax Changes: Empirical Evidence from the 1997 and 1998 Tax Acts"

Kathleen McGarry, NBER and University of California, Los Angeles, "Inter Vivos Transfers or Bequests? Estate Taxes and the Timing of Parental Giving"

Austan Goolsbee, NBER and University of Chicago, "Internet Commerce, Tax Sensitivity, and the Generation Gap"

Alan J. Auerbach, NBER and

University of California, Berkeley, and **Philip Oreopoulos**, University of California, Berkeley, "Generational Accounting and Immigration in the United States" (NBER Working Paper No. 7041)

Pamela Loprest and **Stefanie Schmidt**, Urban Institute, and **Ann Dryden Witte**, NBER and Wellesley College, "Welfare Reform under PRWORA: Aid to Children with Working Families?"

The past 20 years have seen a dramatic increase in the share of executive compensation paid through

stock options. **Hall** and **Liebman** examine the extent to which tax policy has influenced executive com-

penetration and then discuss the implications of rising stock-based pay for tax policy. After analyzing how

changes in various tax rates affect the tax advantages of stock options relative to salary and bonus, the authors conclude that tax changes probably have not played a major role in the dramatic explosion in executive stock option pay since 1980. Rather, the million-dollar rule (which limited the corporate deductibility of nonperformance-related executive compensation to \$1 million) has led firms to adjust the composition of their pay away from salary and toward "performance related pay," although the authors' estimates suggest that this substitution was minor. Finally, significant shifting of the timing of option exercises in response to changes in tax rates has not occurred in either of the two tax reforms of the 1980s. The authors also find that much of the unusually large level of option exercises in 1992 was the result of the rising stock market rather than the change in marginal tax rates.

Shackelford outlines seven necessary conditions for stock prices to be affected by a change in the taxation of long-term capital gains. Specifically, the marginal investor must be an individual, investing for the requisite holding period, selling in a taxable disposition, and compliant. His short-term capital gains from all investments equal or exceed short-term capital losses, and his long-term capital gains from all investments equal or exceed long-term capital losses. In addition, the capital gains tax change must alter the investor's expectation of the taxes that will be generated when he sells in the future, and inelasticities in the supply of capital must prevent immediate economic readjustment. The author also reviews four studies that estimate the stock market reaction to capital gains tax changes in the Taxpayer Relief Act of 1997 and the IRS Restructuring and Reform Act of 1998; they find that capital gains tax

policy plays a role in establishing equity values.

McGarry focuses on the effects of estate taxes on inter vivos giving from parents to children. For most wealthy families, estate taxes increase the cost of bequeathing wealth to children relative to the cost of making inter vivos gifts. One would therefore expect these families to make larger and more frequent gifts. McGarry finds that parents do respond to the incentives in the tax law in this way; both the probability and amount of inter vivos transfers are larger for parents whose estates will likely be taxed. She also finds that inter vivos transfers increase with the expected marginal tax rate. The current proposal to eliminate the estate and gift taxes would likely reduce yearly inter vivos transfers from the wealthy to their children by nearly 30 percent. If the timing of transfers is important to children, then this change will affect their well-being.

Goalsbee examines two major surveys of Internet users in late 1997 and late 1998 to determine the sensitivity of Internet commerce to tax rates. He finds that new users in both samples show little sensitivity to tax rates. Still, overall sensitivities to tax rates are not falling, despite the rapidly increasing numbers of new users, because as they gain experience, their tax sensitivity rises substantially. Internet commerce as a whole continues to be highly sensitive to tax rates and would fall significantly if existing sales taxes were enforced online.

Auerbach and **Oreopoulos** reconsider the fiscal impact of immigrants over time, using the technique of generational accounting. They find that because new immigrants represent a larger fraction of future generations than of present ones, shifting the burden onto future generations also shifts it, relatively, onto new

immigrants. Thus, if the entire fiscal imbalance currently estimated for the United States is placed on future generations, the presence of new immigrants will reduce the burden borne by natives. Second, when a policy of fiscal responsibility is followed, whether there is a fiscal gain from immigration depends on the extent to which government purchases rise with the immigrant population. Finally, the impact of immigration on fiscal balance is extremely small relative to the size of the overall imbalance itself. Thus, immigration should be viewed neither as a major source of the existing imbalance, nor as a potential solution to it.

Loprest, Schmidt, and Witte assess some of the major themes and impacts of welfare reform that have emerged since the passage of the 1996 welfare reform bill. They note a marked decline in the number of individuals receiving cash assistance and an equally marked increase in the number of children being cared for in nonfamilial settings. A larger proportion of cash-assistance recipients are now working, or are in other approved activities. Increased child care subsidies also appear to have increased the earnings of both current and former welfare recipients and other low-income families. The preliminary results of this study suggest that work requirements and time limits have succeeded in moving low-income women with children into jobs but have decreased the wages these women are able to obtain, as compared with women who are not subject to time limits.

These papers and their discussion will be published by the MIT Press. In advance of the publication, most of these papers will be available at "Books in Progress" on the NBER's Web site, www.nber.org.

The Economic Effects of Taxation

The NBER held a conference on "The Economic Effects of Taxation" on November 19 and 20 in Cambridge. Organizer James M. Poterba, NBER and MIT, selected the following papers for discussion:

Matthew Eichner, NBER and Columbia University, and **Todd M. Sinai**, NBER and University of Pennsylvania, "Capital Gains Tax Realizations and Tax Rates: New Evidence from Time Series and Microdata"

Discussant: Alan J. Auerbach, NBER and University of California, Berkeley

Joel M. Dickinson, The Vanguard Group; **John B. Shoven**, NBER and Stanford University; and **Clemens Sialm**, Stanford University, "Tax Externalities

of Equity Mutual Funds"

Discussant: Douglas A. Shackelford, NBER and University of North Carolina, Chapel Hill

Jerry Hausman, NBER and MIT, "Efficiency Effects on the U.S. Economy from Wireless Taxation" (NBER Working Paper No. 7281)

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

Nada Eissa and **Hilary Williamson Hoynes**, NBER and University of California, Berkeley, "Explaining the Fall and Rise in the Tax Cost of Marriage: The Effect of Tax Law and Demographic Trends, 1984-97"

Discussant: Bruce D. Meyer, NBER and Northwestern University

Susan Dynarski, NBER and Harvard University, "HOPE for Whom? Financial Aid for the Middle Class

and Its Impact on College Attendance" Discussant: Joel Slemrod, NBER and University of Michigan

David Joulfaian, U.S. Department of the Treasury, "Estate Taxes and Charitable Bequests by the Wealthy" Discussant: Douglas Holtz-Eakin, NBER and Syracuse University

Daniel R. Feenberg, NBER, and **Jonathan S. Skinner**, NBER and Dartmouth College, "Medicare Taxes and Expenditures"

Discussant: William Gale, The Brookings Institution

Andrew Mitrusi, NBER, and **James M. Poterba**, "The Distribution of Payroll and Income Tax Burdens, 1979-99"

Discussant: Harvey S. Rosen, NBER and Princeton University

Using 1986-97 data, **Eichner** and **Sinai** update the time-series evidence on the response of capital gains realizations to tax rates. They find evidence that repeated changes in the tax law may reduce the stock of unrealized gains, so that the behavioral response to a series of rate changes may diminish with time. They also find that the increasing role of mutual funds as an investment vehicle, and the resulting transfer of control over realization decisions from investors to fund managers, may have dulled the response of realization to capital gains tax rate changes. Using microdata, they conclude that the high levels of asset sales in 1986 did not reduce the amount of gains realized in 1987. Finally, the authors determine that the capital gains tax rate reductions in the Taxpayer Relief Act of 1997 would have been nearly revenue-neutral without other aggregate

changes, but that the Act could generate anywhere from a 10 percent annual loss of capital gains tax receipts to a 10 percent annual gain.

Investors holding mutual funds in taxable accounts face a classic dilemma: the aftertax return on their investment depends on the behavior of others. In particular, redemptions may force the mutual fund to sell some of its equity positions in order to pay off the liquidating investors. As a result, the mutual fund may be forced to distribute realized capital gains to its shareholders. The taxes of investors who stay with the fund are accelerated by the actions of those leaving the fund. On the other hand, new investors have a positive effect on the accounts of existing investors by diluting the unrealized capital gain position of the fund. The simulations that **Dickinson**, **Shoven**, and **Sialm** present show that these factors are important determinants of

the aftertax performance of equity mutual funds. Mutual fund managers can significantly influence the magnitude of these factors by choosing tax-efficient accounting techniques and investment policies.

Hausman measures for the first time the economic efficiency effects of the taxation of wireless services, which are taxed by federal, state, and local governments at relatively high rates, ranging from 14 to 25 percent. He concludes that such taxes are a much greater drain on the economy than are their direct costs. The taxes Hausman identifies cost the economy \$2.56 billion more than the \$4.79 billion they raise in tax revenues. These taxes are paid by wireless consumers and thereby suppress demand for service, imposing an efficiency loss on the economy of \$0.53 for every \$1 currently raised in taxes. Prospective taxes will impose an efficiency loss of \$0.72 to \$1.14 per additional \$1 of

tax revenue raised. These losses are in addition to the efficiency losses of raising the same amount of revenue by income taxation.

Eissa and Hoynes document changes to the "marriage tax" from 1984 to 1997, during which two major tax acts were passed. They find that the likelihood of facing a marriage tax penalty is rising over time, so that marriage is more likely to be taxed in 1997 than it was in 1984. They also find substantial differences by income class in the change in the tax consequence of marriage. The marriage tax is increasing most substantially for taxpayers with incomes between \$30,000 and \$50,000 but is declining for taxpayers with incomes below \$20,000 (in 1997 dollars). The substantial variation in the overall tax consequence of marriage over time, as well as along the income distribution, is driven by expansions to the Earned Income Tax Credit. The authors conclude that changes in tax laws explain a substantial portion of the marriage tax cost trend between 1984 and 1997. More important, though, changes in the marriage tax cost not explained by tax law are driven almost exclusively by the changing labor market attachment of married women (as measured by their share of family earnings).

Dynarski estimates the impact of government aid on college attendance by evaluating Georgia's HOPE Scholarship, the inspiration for the new federal Hope Scholarship. Her results suggest that Georgia's program has had a surprisingly large impact on the college attendance rate of middle- and high-income youth. Using a set of nearby states as a control group, she finds that Georgia's program has likely increased the college attendance rate of 18- to 19-

year-olds by 7.5 to 8.3 percentage points. Her results suggest that \$1,000 in aid increases the college attendance rate of upper-income youth by 3.9 to 5.7 percentage points. Because of key differences between the federal and Georgia programs, these estimates should be treated as a generous upper bound on the predicted effect of the federal Hope Scholarship. Georgia's program also has widened the gap in college attendance between blacks and whites and between those from low- and high-income families. The federal Hope Scholarship also is predicted to exacerbate already large racial and income gaps in college attendance in the United States.

Joulfaian examines the effects of estate taxation on charitable giving. Using data from estate tax returns of decedents in 1992, he finds the estate tax deduction to be an important consideration in determining charitable bequests. In the absence of the deduction, bequests are reported to decline by about 50 percent. On the other hand, in the absence of the estate tax, such bequests decline by about 12 percent; much of the resulting increase in the tax price is offset by an increase in aftertax wealth. Joulfaian also finds that charitable giving declines with life insurance ownership and lifetime giving.

Feenberg and Skinner match information on past taxes paid and on future anticipated benefits to draw inferences about how much of the Medicare payroll tax and income tax share might be returned in the future through Medicare benefits. The authors find that, on average, households can expect to receive \$1.24 in Medicare benefits per \$1 of payroll tax paid. The benefit ratio is substantially higher for lower-income house-

holds, but even for those with incomes in excess of \$100,000, estimated benefits are 53 cents per \$1 of tax paid. The relative benefits for those over age 65 are \$2.40 per \$1 paid, but for those under 65 are only \$1.09 per \$1 paid. For a household making \$35,000–\$50,000, the ratio of expected Medicare benefits to taxes paid ranges from 0.81 cents in Minnesota and 0.69 cents in Oregon per \$1 of taxes paid to \$1.68 of benefits in Louisiana and \$1.46 in Massachusetts per \$1 of taxes paid. These differences cannot be explained plausibly by differences in income or health; instead they seem to be largely the consequence of practice style and medical care intensity.

Mitrusi and Poterba present new evidence on the distribution of income and payroll tax burdens for U.S. households between 1979 and 1999. They also estimate how the Taxpayer Relief Act of 1997 affected individual income tax liabilities. As a result of the expansion of the Earned Income Tax Credit in the late 1980s and early 1990s, as well as other changes in the federal personal income tax, payroll tax liabilities now exceed income tax liabilities for nearly two-thirds of households, they find. Twenty years ago, only 44 percent of households faced higher payroll than income tax burdens. The increase in the relative importance of payroll taxes has been greatest for middle-income households, they conclude.

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

InterAmerican Seminar on Economics

The NBER and the Universidad del CEMA in Buenos Aires jointly sponsored the Twelfth Annual Inter-American Seminar on Economics, on the topic "Economic Integration: Financial and Real" on December 2-4. Sebastian Edwards, NBER and University of California, Los Angeles, and Edgardo Zablotsky, Universidad del CEMA, organized this year's program.

Hali Edison, Federal Reserve Board, and **Carmen M. Reinhart**, NBER and University of Maryland, "Stopping Hot Money"

Discussant: Roberto Steiner, Universidad de los Andes, Colombia

Manuel Sánchez and **Nathaniel Karp**, Grupo Financiero Bancomer, "NAFTA's Economic Effects on Mexico"

Discussant: Mariano Tommasi, Universidad de San Andrés

Sebastian Edwards and **Raul Susmel**, University of Houston, "Interest Rate Volatility in Emerging Markets: Evidence for the 1990s"

Discussant: Ilan Goldfajn, PUC-Rio, Brazil

Geert Bekaert, NBER and Stanford University, **Campbell R. Harvey**, NBER and Duke University, and **Christian Lundblad**, Duke University, "Emerging Equity Markets and Economic Development"

Discussant: Adolfo Aprea, Universidad del CEMA

Frederic S. Mishkin, NBER and Columbia University, and **Miguel A. Savastano**, International Monetary Fund, "Monetary Policy Strategies for Latin America"

Discussant: Federico Sturzenegger, Universidad Torcuato di Tella

Jeffrey A. Frankel, NBER and Harvard University, and **Sergio L. Schmukler** and **Luis Servén**, World Bank, "Verifiability: A Rationale for the Failure of Intermediate Exchange Rate Regimes"

Discussant: Miguel Kiguel, Ministry of Economics and Public Works and Services, Argentina

Hernán Eduardo Vallejo, Universidad de los Andes, Colombia, "Colombia's Natural Trade Partners and Its Bilateral

Trade Performance: Evidence from 1960 to 1996"

Discussant: Alvaro Quijandria, Apollo, Peru

Ronald Fischer, Universidad de Chile, "Trade and Income Distribution"

Discussant: Fernando Navajas, FIEL
Pablo Druck, Universidad del CEMA, "Banking Crisis, Implicit Government Guarantees, and Optimal Insurance Scheme"

Discussant: Andrew Powell, Central Bank of Argentina

Ricardo Hausmann, **Ugo Panizza**, and **Ernesto Stein**, Inter-American Development Bank, "Why Do Countries Float the Way They Float?"

Discussant: Andrea Repetto, Universidad de Chile

Andres Velasco, NBER and New York University, and **Roberto Chang**, Federal Reserve Bank of Atlanta, "Exchange Rate Policy with Imperfect Financial Markets"

Discussant: Jorge Streb, Universidad del CEMA

While high interest rates and foreign exchange sales are the most common way of dealing with a speculative attack in the foreign exchange market, several countries resorted to capital controls during recent currency crises. **Edison** and **Reinhart** use daily financial data to examine four of these capital controls episodes: Brazil in 1999, Malaysia in 1998, Spain in 1992, and Thailand in 1997. They assess the extent to which the capital controls were effective and conclude that, in two of the three cases (Brazil and Thailand), the controls did not deliver much of what was intended. By contrast, in

the case of Malaysia the controls did align closely with expectations of what they could achieve: greater interest rate and exchange rate stability and more policy autonomy.

Since 1994, the Mexican economy has experienced higher growth than in previous years, coinciding with a significant surge in foreign investment and export expansion, commonly viewed as resulting from the North American Free Trade Agreement (NAFTA). **Sánchez** and **Karp** identify the effects of this preferential trade agreement on some key economic variables in order to determine whether the originally pre-

dicted benefits are developing.

Edwards and **Susmel** use high-frequency interest rate data for a group of Latin American countries to analyze the behavior of volatility through time. They are particularly interested in understanding whether periods of high volatility spill over across countries. They show that high-volatility episodes are generally short-lived, lasting from two to seven weeks. They find some weak evidence of volatility co-movements across countries, but overall, their results do not support "contagion" stories.

Bekaert, Harvey, and Lundblad

analyze the prospects for real economic growth after financial liberalizations. In contrast with previous research, they identify the financial liberalization dates of a number of countries and examine the influence of liberalizations while controlling for a number of other macroeconomic and financial variables. They find that financial liberalizations are associated with significant increases in real economic growth.

Mishkin and Savastano consider the alternative strategies for monetary policy in Latin American countries. They suggest that the focus of the debate about the conduct of monetary policy should be on whether the monetary policy regime appropriately constrains discretion in monetary policymaking. There are three basic frameworks for monetary policy in Latin America: a hard exchange-rate peg, monetary targeting, and inflation targeting. The authors look at the advantages and disadvantages of each of these strategies and then examine the recent track record of monetary policy in some Latin American countries.

Frankel, Schmukler, and Servén discuss the notion of verifiability, by which they mean the ability of a market participant to infer statistically from observed data that the exchange rate regime announced by the authority is in fact in operation. Verifiability is a means to credibility, and a simple regime may be more verifiable by market participants than a complicated intermediate regime. The authors analyze the case of Chile, illustrating that a band around a peg makes the verification more difficult. Under a narrow band, the weights on the central parity can be estimated correctly. However, wider bands make the verification of the central parity impossible. The amount of data required may well exceed the length of time that a given regime is maintained. The authors show that, overall, the amount of information

necessary to verify the exchange rate regimes increases with the regimes' complexity.

Vallejo identifies and quantifies the relative importance of the different factors that determine bilateral trade in Colombia. He also evaluates the impact of regional trade agreements in terms of their significance in determining bilateral trade and compares the level of trade that would naturally occur geographically to the actual level of trade. Finally, Vallejo studies the performance of bilateral trade and suggests that these results may be useful to both Colombian policymakers and entrepreneurs and to their trade partners.

Fischer presents a general framework for analyzing the evolution of personal income distribution after a trade liberalization. His model allows for many factors of production and for the possibility of capital gains. In this framework, the short-run evolution of income inequality depends on the wealth-to-wage ratio. Changes in long-run income inequality, on the other hand, are affected by the behavior of interest rates. Fischer shows that in a dynamic framework, the type of export good determines the effect of liberalization on inequality. The data show that the predictions of the model are correct in a restricted model that does not include human capital, but that they fail when human capital is included.

The most common explanation of banking crises focuses on anticipation of a government bailout, which occurs when investors expect that the government will help them cover their losses in case of a generalized adverse shock. **Druck** shows how an insurance scheme can eliminate the externality generated by such a government bailout policy. He analyzes the example of liquidity risk, defined as an unexpected cash withdrawal, and presents a scheme to deal with this risk. In this scheme, each bank would pay a premium depending on

that bank's risk, toward insurance. In Argentina, the central bank charges each bank a premium that depends on the bank's liquidity position; this provides insurance which the central bank acquires in international markets. Druck also estimates the social cost of a bank crisis that is different from the net transfer from the government to the banking sector and independent of the crisis itself.

Using a sample of 30 countries that operate under either floating exchange rate regimes or wide bands, **Hausmann, Panizza, and Stein** document important differences in behavior regarding the management of exchange rates. To explain these differences, the authors build a model in which financially constrained firms borrow both in dollars and local currency and output is a function of both the interest rate (through a credit channel) and depreciation (through a balance sheet channel). To test the implications of the model, they use estimations of the pass-through ratios for all countries in the sample, and data on the ability of countries to borrow internationally in their own currencies. They find that high pass-through and foreign currency liabilities tend to reduce the willingness of policymakers to let the exchange rate float freely, although the effects seem to be more clear-cut in the case of foreign currency liabilities.

Recent financial crises in emerging markets have raised questions about the proper monetary policy response. A key issue is whether under imperfect financial markets a monetary expansion is indeed expansionary. Contrary to standard theory, financial effects—particularly the impact of currency depreciation on the value of collateral—may work to reduce the level of output. **Velasco and Chang** build a general equilibrium model with microfoundations, sticky prices, and imperfect financial markets. The model embeds these financial effects

as well as the more conventional Mundell-Fleming channels. Preliminary simulations suggest that, under flexible exchange rates, a monetary expansion is indeed expansionary

despite the presence of potentially contractionary financial effects.

These proceedings will be published in a special issue of the *Journal of Development Economics*. In

advance of the journal's publication, most of these papers will be available at "Books in Progress" on the NBER's Web site, www.nber.org.

An Economic Analysis of Risky Behavior among Youths

The NBER's Program on Children, which is directed by Jonathan Gruber of NBER and MIT, convened researchers on December 10 and 11 to discuss "Risky Behavior among Youths." The following papers were presented at the two-day session:

Jonathan Gruber and **Jonathan Zinman**, MIT, "Youth Smoking in the United States: Evidence and Implications"

Discussant: Donald Kenkel, Cornell University

Thomas Dee, Swarthmore College and **William N. Evans**, NBER and University of Maryland, "Teens and Traffic Safety"

Discussant: James M. Poterba, NBER and MIT

Phillip Levine, NBER and Wellesley College, "The Sexual Activity and Birth Control Use of American Teenagers"

Discussant: Douglas O. Staiger, NBER and Dartmouth College

Philip J. Cook and **Michael J. Moore**, NBER and Duke University, "Environment and Persistence in Youthful Drinking Patterns"

Discussant: John Mullahy, NBER and University of Wisconsin

David M. Cutler and **Edward L. Glaeser**, NBER and Harvard University, and **Karen Norberg**, Boston Medical Center, "Suicide"

Discussant: Sendhil Mullainathan, NBER and MIT

Steven D. Levitt, NBER and University of Chicago, and **Lance Lochner**, University of Rochester, "The Determinants of Juvenile Crimes"

Discussant: Richard B. Freeman, NBER and Harvard University

Rosalie L. Pacula, NBER and Rand; **Michael Grossman**, NBER and City University of New York Graduate School; **Frank J. Chaloupka**, NBER and University of Illinois at Chicago; **Matthew C. Farrelly**,

Research Triangle Institute; and **Lloyd D. Johnston** and **Patrick M. O'Malley**, Institute for Social Research, University of Michigan, "Marijuana and Youth"

Discussant: John DiNardo, NBER and University of California, Irvine
Janet Currie, NBER and University of California, Los Angeles, and **Jay Bhattacharya**, Rand, "Youths at Nutritional Risk: Determinants and Consequences"

Discussant: Sarah McLanahan, Princeton University

Ted O'Donoghue, Cornell University, and **Matthew Rabin**, University of California, Berkeley, "Risky Behavior among Youths: Some Issues from Behavioral Economics"

Discussant: David Laibson, NBER and Harvard University

The rate of teen smoking rose by one-third in the 1990s. **Gruber** and **Zinman** explore four aspects of the decision by youths to smoke. They find that smoking participation is not simply concentrated among the most disadvantaged youth; indeed, increasingly over time youth smoking is taking place among white, suburban youth who have college-educated parents and good grades. The authors also show that neither changes in demographic characteristics nor new attitudes toward smok-

ing can explain the striking increase in smoking rates in the 1990s. Price is a powerful determinant of smoking for high school seniors, though. Analysis of data for the 1991-7 period suggests that the drop in cigarette prices in the early 1990s can explain 30 percent of the subsequent upward smoking trend. However, price is not important for younger teens, although restrictions on access to cigarette purchases may lower the quantity that younger teens smoke. Finally, the authors demonstrate an important

link between smoking as a youth and smoking later in life. This suggests that policies that stop youth from smoking can have long-lasting effects, and raises potential concerns about the long-run implications of the current rise in youth smoking.

Traffic accidents are the leading cause of deaths among young adults, but teen traffic safety has improved considerably in recent years. Between 1979 and 1997, the teen traffic fatality rate has fallen by almost 25 percent, much more than among

older drivers. According to **Dee** and **Evans**, these numbers actually understate the true improvements in safety, because teen driving has increased considerably over this period. Nearly all of the drop in the fatality rate can be explained by a large reduction in drunk driving among teens, they find. Further, the widespread adoption of certain state policies (for example, mandatory safety belt use laws, higher minimum legal drinking ages, and other drunk-driving measures) has been effective at saving lives and explains a substantial proportion of the decline in teen traffic fatalities.

Levine analyzes two datasets of cross-sectional data which can provide correlational evidence regarding who engages in sexual activity and who uses birth control, and state-level data over time which can be used to identify whether changes in "prices" affect these activities. Here prices are measured by economic conditions, the incidence of AIDS, the generosity of welfare, and the restrictiveness of abortion policy. Levine's analysis indicates that some prices indeed matter: if engaging in sexual activity is "more expensive" through, say, an improved labor market or the increased probability of contracting AIDS, then teenage women are less likely to have sex or more likely to use contraception.

The prevalence of drinking per se and binge drinking among high school students is lower now than in the early 1980s, but it remains a serious problem. **Cook** and **Moore** evaluate the environment in which drinking is initiated and sustained. In particular, they use panel data from the National Longitudinal Survey of Youth (NLSY) to assess the extent to which alcohol-control measures influence how much adolescents drink later in life. The authors confirm that alcohol control measures in the individual's state of residence have a contemporaneous effect on

the likelihood of drinking and binge drinking. They also find that the control measures that were in place years earlier, when the individual was 14 years old, have a discernible effect on current drinking.

Youth suicide rates have tripled in the past 40 years, and there are 400 suicide attempts for every successful youth suicide. Exploring why suicide attempts and successes are so high, **Cutler**, **Glaeser**, and **Norberg** reach three conclusions. They contend that many suicide attempts are designed not to result in death but instead to draw attention to unhappy lives, or to punish parents or other role models. The authors also find that the best predictor of teen suicide rates is the share of women who are divorced. Higher divorce rates among mothers of teenagers are associated with increased youth suicides. Finally, the authors find that youths are more likely to attempt suicide when their friends or relatives have done so.

Levitt and **Lochner** analyze the determinants of juvenile crime using three different datasets. The data on individuals highlight the importance of factors such as gender, family environment, and cognitive ability in predicting criminal involvement. Data by census tract from Chicago also point to the effect on crime of unstable homes; further, high concentrations of children in poverty and local income inequality play an important role in juvenile crime. State-level data demonstrate the importance of the criminal justice system in restraining criminality: coincident with the transition from juvenile to adult court, crime drops sharply in those states where adults are punished more heavily. The authors conclude, however, that none of these determinants of crime does a good job of explaining the time-series pattern of juvenile crime over the past two decades.

Pacula, **Grossman**, **Chaloupka**, **Farrelly**, **Johnston**, and **O'Malley** estimate the price sensitivity of mari-

juana use. They estimate that a 10 percent increase in price lowers the number of high school seniors who used marijuana in the past year by approximately 3 percent. The rise in the real (inflation-adjusted) price accounts for almost three-fifths of the 50 percent reduction in the number of users between 1982 and 1992, they conclude. The increase in the percentage of high school seniors reporting great risk of harm from regular marijuana use accounts for the remainder of the decline. The reduction in the real price of marijuana since 1992 explains two-fifths of the approximate doubling in the number of users between that year and 1998, while the reduction in the harm measure explains three-fifths of the increase. These findings underscore the usefulness of considering price in addition to more traditional determinants in any analysis of marijuana consumption decisions made by youths.

Currie and **Bhattacharya** examine the prevalence and determinants of poor nutritional outcomes among American youths. They find an alarming number of obese youths who have diets high in fats and sweets and low in fruits and vegetables. Many youth also suffer from deficiency-related problems such as anemia, vitamin shortages, and lack of food. The authors find that these deficiency-related problems are generally related more strongly to resource constraints, while obesity and overall diet quality are related more strongly to information. Moreover, their measures of resource constraints are more important for blacks and Hispanics, while their measures of information are more important for whites. These results suggest that food and nutrition programs need to address informational problems as well as to alleviate resource constraints if they are to successfully attack the nutritional problems facing American youth.

O'Donoghue and **Rabin** explore some of the ways that economists can incorporate insights from recent research combining psychology and economics to help understand risky

behavior by adolescents.

These papers will be published by the University of Chicago Press in an NBER Conference Volume. In advance of its publication, most of these

papers will be available at "Books in Progress" on the NBER's Web site, www.nber.org.

Macroeconomic Effects of Corporate Finance

An NBER-Universities Research Conference on "The Macroeconomic Effects of Corporate Finance" took place in Cambridge on December 10 and 11. Organizers Jeremy C. Stein, NBER and Harvard University, and Luigi Zingales, NBER and University of Chicago, chose these papers for discussion:

Jeffrey Wurgler, Yale University, "Financial Markets and the Allocation of Capital"

Discussants: Ross Levine, University of Minnesota, and David S. Scharfstein, NBER and MIT

Peter Blair Henry, Stanford University, "Do Stock Market Liberalizations Cause Investment Booms?"

Discussants: Rene M. Stulz, NBER and Ohio State University, and Sheridan Titman, NBER and University of Texas

Karl Lins and **Marc Zenner**, University of North Carolina, Chapel Hill, and **Deon Strickland**,

Ohio State University, "Do Non-U.S. Firms Issue Stock on U.S. Equity Markets to Relax Capital Constraints?"

Discussants: John Coffee, Columbia University, and Rafael La Porta, NBER and Harvard University

Paola Sapienza, Northwestern University, "What Do State-Owned Firms Maximize? Evidence from the Italian Banks"

Discussants: Alberto F. Alesina, NBER and Harvard University, and Anil K. Kashyap, NBER and University of Chicago

Nicola Cetorelli and **Michele Gambera**, Federal Reserve Bank of Chicago, "Banking Market Structure, Financial Dependence, and Growth: International Evidence from Industry Data"

Discussants: Judith Culver, NBER and University of Chicago, and Gary B. Gorton, NBER and University of Pennsylvania

Simon Johnson, MIT; **Peter Boone**, Brunswick Warburg;

Alasdair Breach, Goldman Sachs, and **Eric Friedman**, Rutgers University, "Corporate Governance in the Asian Financial Crisis"

Discussants: Kenneth A. Froot and Julio J. Rotemberg, NBER and Harvard University

Ricardo J. Caballero, NBER and MIT, and **Arvind Krishnamurthy**, Northwestern University, "Emerging Market Crises: An Asset Markets Perspective"

Discussants: David Backus, NBER and New York University, and Oliver D. Hart, NBER and Harvard University

Michael W. Klein, NBER and Tufts University; **Joe Peek**, Boston College; and **Eric Rosengren**, Federal Reserve Bank of Boston, "Troubled Banks, Impaired Investment: The Case of Japanese FDI"

Discussants: Chris James, University of Florida, and Randall Morck, University of Alberta

Economists have long believed that financial markets and institutions encourage capital to flow toward high value uses and away from low value uses. **Wurgler** analyzes the patterns of manufacturing investment in 65 countries and finds that those with developed financial markets indeed do a better job of allocating capital. Specifically, countries with developed financial markets tend to

increase investment more in their growing manufacturing industries and to decrease investment more in declining industries. In addition, countries with extensive state ownership do worse at allocating capital, while countries with strong legal protections for external investors, and those with relatively more firm-specific information in their stock returns, do somewhat better. These

findings confirm the importance of formal financial markets for a well-functioning economy.

Stock market liberalizations lead private investment booms. In **Henry's** sample of 11 developing countries that have liberalized, 9 experience growth rates of private investment above their nonliberalization median in the first year after liberalizing. In the second and third years after lib-

eralization, this number is 10 of 11 and 8 of 11, respectively. The mean growth rate of private investment in the three years immediately following stock market liberalization exceeds the sample mean by 22 percentage points. This evidence stands in sharp contrast to recent work suggesting that capital account liberalization has no effect on investment.

An increasing number of non-U.S. firms have listed their stock on U.S. equity markets. While **Lins, Strickland**, and **Zenner** recognize that there are various reasons for non-U.S. firms to seek U.S. listings, they focus on one motive: a U.S. listing enhances access to external capital markets. They find that after a U.S. listing, the sensitivity of investment to cash flow does not change for firms in developed markets but decreases significantly for firms from emerging capital markets. The authors also document that about half of the listing firms from both emerging and developed markets explicitly state in their annual reports the importance of access to external capital markets. Further, the authors find that firms increasingly access international capital markets after a U.S. listing and that this increase is more pronounced for firms from emerging markets.

Using information on individual loan contracts, **Sapienza** studies the differences in credit policies between state-owned and privately owned banks. She compares the interest rate charged to two sets of companies with identical characteristics borrowing respectively from state-owned and privately owned banks. Her results support the view that state-owned banks maximize different objectives than do privately owned banks. She finds that state-owned banks charge lower interest rates than privately owned banks to similar or identical firms. This result

remains true even if the company is able to borrow from privately owned banks, which is inconsistent with the view that state-owned banks cure market failures. The author also finds that state-owned banks mostly favor firms located in depressed areas. She provides evidence of different behavior between central-government-owned banks and local-government-owned banks: the former focus on larger enterprises, while the latter are prone to favor small companies.

Cetorelli and **Gambera** ask how relevant banking market structure is to growth. Substantial evidence shows a positive relationship between the level of development of the banking sector of an economy and its growth in long-run output. Little is known, however, about the role of the market structure of the banking sector on the dynamics of capital accumulation. The authors show that bank concentration promotes the growth of those industrial sectors that are more in need of external finance by facilitating credit access to younger firms. They also find a general depressing effect on growth associated with a concentrated banking industry, though, which affects all sectors and all firms indiscriminately.

The Asian Crisis of 1997–8 affected all the emerging markets open to capital flows. Measures of corporate governance, particularly the effectiveness of protection for minority shareholders, explain the extent of depreciation and stock market decline better than do standard macroeconomic measures. As a possible explanation, **Johnson, Boone, Breach**, and **Friedman** propose that in countries with weak corporate governance, worse economic prospects result in more expropriation by managers and thus there is a larger fall in asset prices.

The difference between a mild downturn and a deep crisis is the occurrence of sharp fire sales of domestic assets and possibly exchange rates and the ensuing collapse in the balance sheets of both the financial and the nonfinancial sector. **Caballero** and **Krishnamurthy** contend that a poor contractual environment explains these and other related phenomena that are present in emerging markets. They explain the large short-run shift in the effective interest parity condition—or fire sale—in terms of the weakening of a country's *international* collateral. The lack of precautions, on the other hand, is a consequence of weak *domestic* collateral, or underdeveloped domestic financial markets, which drive a wedge between the private and social valuation of assets appealing to foreign investors. Further, domestic banks are the mechanism by which firms with purely domestic collateral are able to access international markets. Thus, the banks' endogenous collapse as domestic assets depreciate sharply reduces access to international financial markets and in so doing may trigger a feedback process with multiple features of equilibriums.

Klein, Peek, and **Rosengren** exploit a "natural experiment" that provides insights about the role of banks in financing firms in Japan. They use a new dataset that contains a comprehensive list of all publicly available data on foreign direct investment into the United States by more than 200 Japanese firms from 1987 to 1994. They identify the main bank associated with each firm in their dataset and find that foreign direct investment behavior associated with firms linked to a particular bank is significantly affected by the health of that bank.

Economic Reform in India

On December 13–15, the NBER and India's National Council for Applied Economic Research (NCAER) brought together a group of ten NBER economists and about two dozen economists from Indian universities, research institutions, and government departments to discuss economic reform in India. The Indian participants described and analyzed current problems, the directions of economic reform in India, and the performance of the Indian economy in the past decade. The NBER group presented research on the United States and other countries on issues that are related to current Indian reforms. **Raghuram G. Rajan**, NBER and University of Chicago, organized the conference jointly with **Subir Gokarn** of NCAER. The program was:

Rakesh Mohan, NCAER,
"Perspective on India's Reforms"

N.K. Singh, Prime Minister's Office,
"Prospects for Reform"

Martin Feldstein, NBER and
Harvard University, "The Economic
Reform Agenda for India"

Ashok Desai, *Business Standard*,
"The Indian Reform Experience"

T.N. Srinivisan, Yale University,
"Poverty and Reforms in India"

Comments: Kirit Parekh, IGIDR

R. Glenn Hubbard, NBER and
Columbia University, and **Ashok
Lahiri**, NIPFP, "Budget Deficits and
Fiscal Reforms"

Comments: Mihir Desai, Harvard
University

Anne Krueger, NBER and Stanford
University, "Consequences of the
Banking Crisis in Mexico"

Comments: Rajendra Vaidya, IGIDR

Shang-Jin Wei, NBER and Harvard
University, "Can China and India
Double Their Inward Foreign Direct
Investment?"

Comments: Ashoka Mody, World Bank

Florencio Lopez-de-Silanes, NBER
and Harvard University, "The
Benefits of Privatization: Evidence
from Mexico"

Comments: Ratna Sahay, IMF

Marianne Bertrand, NBER and
Princeton University, and **Sendhil
Mullainathan**, NBER and MIT,
"Share Ownership and Control in
India"

Comments: P.J. Nayak, Unit Trust
of India

Pradeep Srivastava, NCAER, "Size
and Efficiency in Indian Banking"

Comments: Arvind Virmani, Ministry
of Finance

Nagesh Kumar, RIS, "FDI in India"

Comments: Vivek Srivastava, NCAER

Panel Discussion on Financial
Sector Reforms: **Frederic Mishkin**,
NBER and Columbia University;
Ajay Shah, IGIDR; **Raghuram Rajan**
University of Chicago and NBER;
Subir Gokarn, NCAER; and **Surjit
Bhalla**, Oxus Fund Management

Barry Eichengreen, NBER and
University of California, Berkeley,
"Strengthening the International
Financial Architecture: Where Do
We Stand?"

Montek Ahluwalia, Planning
Commission, "The New Financial
Architecture"

Panel Discussion on "The Road
Ahead: Distilling the Message":
Francesco Caselli, University of
Chicago; **Urjit Patel**, IDFC; and
T.N. Ninan, *Business Standard*



Bureau News

Kathryn Shaw Nominated to CEA

NBER Research Associate Kathryn L. Shaw, a Professor of Economics at Carnegie Mellon University's Graduate School of Industrial Administration, was nominated by President Clinton to be a Member of the Council of Economic Advisers on November 17, 1999. She is serving as Senior Economic Advisor to the Council while awaiting Senate confirmation. Shaw, an expert in labor economics and human resource management, will cover such topics as welfare reform, Medicare, pay equity, and other issues in labor economics and industrial organization at the Council. Upon Senate approval of her nomination, Shaw will succeed another NBER Research Associate, Rebecca Blank, who has returned to

academe and is currently dean of the University of Michigan's School of Public Policy.

Shaw received her Ph.D. in economics at Harvard University in 1981 and has been on the faculty at Carnegie Mellon University since then. She has published extensively on human resources management and innovative managerial practices, has served on a Research Panel of the National Science Foundation, and was an editor of the *Journal of Labor Economics*. In 1984-5 she was a Visiting Economist at the Federal Reserve Board.

Shaw is married to Dr. Ricard Townsend, a trauma surgeon, and they reside in Pittsburgh with their three children, Laura, Brian, and Kevin.



Ten NBER National Fellows Named

The NBER recently announced the selection of National Fellows for 2000/1 and 2001/2. These National Fellows will spend one academic year at the Bureau's office in Cambridge, and will devote their time to research and writing in the area of their program affiliation. The National Fellows are selected from among the NBER Faculty Research Fellows.

The 2000/1 NBER National Fellows

are: Nada Eissa, University of California, Berkeley, working in Public Economics; William Gentry, Columbia University, also working in Public Economics; Rebecca Menes, George Mason University, working in Development of the American Economy; Sendhil Mullainathan, MIT, working in Labor Studies; and Matthew Slaughter, Dartmouth College, working in International Trade.

The 2001/2 Fellows are: William Collins, Vanderbilt University, working in Development of the American Economy; Aaron Edlin, University of California, Berkeley, and Christine Jolls, Harvard University, working in Law and Economics; and Kathleen McGarry, University of California at Los Angeles, and Andrew Samwick, Dartmouth College, working in Aging.

Erratum:

The Vice Minister for International Affairs, Ministry of Finance, Japan, is Haruhiko Kuroda. He was incorrectly identified in the Fall 1999 NBER *Reporter*.

NBER's New York Office has Moved

The New York office of the National Bureau of Economic Research moved to a new location at the end of October. The address is now 365 Fifth Ave. (at 34th Street), Suite 5318. The telephone number is (212) 817-7955 and the fax number is (212) 817-1597.

This new location is shared with the Graduate Center of the City University of New York and is next to

their Economics Department. It is in a splendid building that was once the B. Altman & Co. department store. The other owners and occupants of this condominium, in addition to CUNY, are Oxford University Press and the Science, Industry, and Business Division of the New York Public Library, home of their main economics collection.

The new office is considerably larger than the last one, with a comfortable conference room, a library with convenient sets of journals, and a visitors' office. Members of the NBER family from outside New York, and those from New York too, are welcome to make use of the facilities, and all are invited to stop in and see the new home.

Economic Fluctuations and Growth

Fifty members and guests of the NBER's Program on Economic Fluctuations and Growth gathered in Chicago on October 22. Andrew Atkeson, NBER and University of Minnesota, and Matthew D. Shapiro, NBER and University of Michigan, organized this program.

Benjamin Eden, University of Haifa, "Inventories and the Business Cycle: Testing the Implications of a UST Model"

Discussant: Kenneth D. West, NBER and University of Wisconsin

Bart Hobijn, New York University, and **Boyan Jovanovic**, NBER

and New York University, "The Information Technology Revolution and the Stock Market: Preliminary Evidence"

Discussant: Robert E. Hall, NBER and Stanford University

Jess Benhabib, New York University, **Stephanie Schmitt-Grohe**, Rutgers University, and **Martin Uribe**, University of Pennsylvania, "The Perils of Taylor Rules"

Discussant: Peter N. Ireland, NBER and Boston College

Mark Bilal, NBER and University of Rochester, and **Peter J. Klenow**, NBER and University of Chicago, "Quantifying Quality Growth"

Discussant: William D. Nordhaus, NBER and Yale University

Robert B. Barsky, NBER and University of Michigan, and **Lutz Kilian**, CEPR and University of Michigan, "Money, Stagflation, and Oil Prices: A Reinterpretation"

Discussant: James D. Hamilton, NBER and University of California, San Diego

Robert Shimer, NBER and Princeton University, "The Impact of Young Workers on the Aggregate Labor Market" (NBER Working Paper No. 7306)

Discussant: Robert H. Topel, NBER and University of Chicago

Eden tests the implications of a monetary version of the Uncertain and Sequential Trading (UST) model using postwar U.S. data. These data support the hypothesis about the effect of demand shocks: low demand has a persistent positive effect on inventories and a persistent negative effect on output, prices, and labor supply (employment, hours per employee, and effort).

Since 1968, the ratio of stock market capitalization to GDP has varied by a factor of 5. In 1972, the ratio stood at above unity, but by 1974, it had fallen to 0.45, where it stayed for the next decade. It then began a steady climb, and today it stands above 2. **Hobijn** and **Jovanovic** suggest that the information technology (IT) revolution was behind this, and moreover that the capitalization/GDP

ratio will probably decline and then rise after any major technological shift. Their result is based on the assumptions that: the IT revolution was anticipated by early 1973; IT was resisted by incumbent firms, which led their market value to decline; and takeovers are an imperfect policing device that allowed many firms to remain inefficient until the mid-1980s. The IT hypothesis explains

some facts that oil price shocks, increased market volatility, and bubbles do not.

Benhabib, Schmitt-Grohe, and **Uribe** argue that once the zero bound on nominal interest rates is taken into account, active interest rate feedback rules can easily lead to unexpected consequences. Specifically, they show that even if the steady state at which monetary policy is active is locally the unique equilibrium, there typically are an infinite number of equilibrium trajectories originating arbitrarily close to that steady state that converge to a liquidity trap—that is, a steady state in which the nominal interest rate is near zero and inflation is possibly negative.

Using pooled cross-sections of households in the 1980–94 U.S. Consumer Expenditure Surveys, **Bils** and **Klenow** estimate “quality Engel curves” for 50 durable consumer goods. They use the slopes of these curves to predict the rate of quality upgrading. The authors find that the average price paid rises faster for goods with steeper quality slopes. Likewise, the Bureau of Labor Statistics (BLS) prices increase more

quickly for goods with steeper quality slopes, suggesting that the BLS does not fully net out the impact of quality upgrading on prices paid. **Bils** and **Klenow** estimate that quality growth averages about 1.5 percent per year for their 50 goods, with about two-thirds of this, or 1 percent per year, showing up as higher inflation rather than higher real growth. The authors’ model explains half of the variance across goods in quality upgrading during 1980–94.

Standard explanations of the stagflationary episodes of the 1970s stress the role of exogenous supply shocks, notably the oil price increases of 1973 and 1979. In contrast, **Barsky** and **Kilian** make the case that the bulk of stagflation, given the sluggishness of inflation, can be explained by monetary expansions and contractions without reference to supply shocks. It is difficult to rationalize substantial increases in inflation in the GDP deflator as a result of oil price shocks. Monetary fluctuations help to explain variations in the price of oil (and other commodities), which goes along with economic theory about resource prices. The authors point to an important identifi-

cation problem in interpreting oil price fluctuations that the literature has not adequately addressed: while they do not dispute that high oil prices may have worsened the 1974 and 1980 recessions in the United States, they find reasonable doubt about exogenous oil supply cuts as being the ultimate source of these high oil prices.

Using variations across states in lagged birth rates, **Shimer** estimates the response of the unemployment rate and the labor-force-participation rate to variation in the youth share of the working-age population. A 1 percent increase in the youth share in a single state reduces the unemployment rate of young workers by more than 1 percent, and of older workers by more than 2 percent. It raises the labor force participation rate by about 0.33 percent for young workers and by much less for older workers. These results are consistent with increasing returns to scale in the labor market. Young workers are frequently mismatched in their employment, and firms create jobs to take advantage of this mismatch.



Higher Education Project

Members and guests of the NBER's Research Group on Higher Education met in Cambridge on October 29. Director Charles T. Clotfelter, NBER and Duke University, organized this program:

Dominic J. Brewer, RAND; **Eric R. Eide**, Brigham Young University; and **Daniel D. Goldhaber**, The Urban Institute, "An Examination of the Role of Student Race and Ethnicity in Higher Education since 1972"

Discussant: Jill Constantine, Williams College

David J. Zimmerman, Williams College, "Peer Effects on Academic Outcomes: Evidence from a Natural Experiment"

Discussant: Thomas J. Kane, NBER and Harvard University

Christopher Avery and **Andrew Fairbanks**, Harvard University; and **Richard J. Zeckhauser**, NBER and Harvard University, "The Early Admissions Game: The Perspective of Participants"

Discussant: Eric A. Hanusheck, NBER and University of Rochester
Susan M. Dynarski, NBER and Harvard University, "Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion" (NBER Working Paper No. 7422)

Discussant: Sarah Turner, University of Virginia

William E. Becker, Indiana University, and **Robert K. Toutkoushian**, University of New Hampshire, "Measuring Gender Bias in the Salaries of Tenured Faculty Members"

Discussant: Stephen Cameron, Columbia University

Sharon Levin and **Anne Winkler**, University of Missouri; and **Paula Stephan**, Georgia State University, "Imported Brains in Science and Engineering: Employment Consequences for U.S. Citizens in Academe"

Discussant: Ronald G. Ehrenberg, NBER and Cornell University

Brewer, Eide, and Goldhaber use national data on the high school classes of 1972 and 1992 to estimate how students' race and ethnicity affect their application and admission to different types of college. They find that both black and Hispanic students are more likely than white students to apply to a four-year top institution as their first-choice school. There is little evidence of widespread preferential treatment for minority students in institutions' admissions decisions at any point over the past 20 years. However, both black and Hispanic students were found to have received preferential treatment in admissions as compared with white students at the most selective schools; blacks in 1972 and Hispanics in 1992. The authors conclude that only a small number of schools are particularly selective on any grounds, and that even at these schools, any racial/ethnic preference over the past 20 years has been relatively modest.

Using data from four schools on individual students' grades, SAT scores, and the SAT scores of their

roommates, **Zimmerman** finds that first-year roommates are assigned randomly with respect to academic ability. He then measures differences in grades of high-, medium-, or low-SAT-score students living with high-, medium-, or low-SAT-score roommates. He also considers the effect of peers at more aggregated levels, particularly the effects associated with different "academic environments" in clusters of rooms that define distinct social units. Zimmerman finds that peer effects are almost always linked more strongly with verbal SAT scores than with math SAT scores. Students in the middle of the SAT distribution may do somewhat worse in terms of grades if they share a room with a student who is in the bottom 15 percent of the verbal SAT distribution. Students in the top of the SAT distribution are least affected by the SAT scores of their (room or entry) peers.

Using information from interviews, surveys, and college guidebooks and marketing materials, **Avery, Fairbanks, and Zeckhauser** report on the experiences that high school stu-

dents, admitted college students, and guidance counselors have had with early admissions. The authors emphasize three major points. First, colleges do not provide sufficient information for applicants to glean knowledge of the implications of applying early on admissions: a combination of serendipity and inside connection determines which applicants reach accurate conclusions about early admissions. Second, applicants have adopted a wide range of strategies in early admissions. Those who seem least likely to benefit from early admissions are those who have limited information (generally those from high schools where there is limited experience with applications to elite colleges) and those who fear applying early because they require financial aid. Third, early admissions now selects applicants on some desired qualities and some unexpected ones. Excluding students from noncompetitive public schools and international students, 75 percent of the students who were admitted to and ultimately

enrolled at Harvard, MIT, Princeton, or Yale applied early to some college.

Using the death of a parent as a proxy for Social Security beneficiary status, **Dynarski** finds that offering \$1,000 (in 1998 dollars) of grant aid increases educational attainment by about 0.16 years and raises the probability of attending college by four percentage points. Her evidence also suggests that aid has a "threshold effect": a student who has crossed the hurdle of college entry with the assistance of aid is more likely to continue schooling later in life than one who has never attempted college. Finally, Dynarski's cost-benefit analysis indicates that the aid program she examined was a cost-effective use of government resources.

Gender-equity studies of faculty salaries that use rank are criticized on the grounds that gender bias in rank

attainment affects the estimated level of pay disparity between male and female faculty. **Becker and Toutkoushian** show how a "Heckit estimation procedure" can be used to correct for the effects on salary of gender bias in promotion from associate to full professor. This procedure involves two equations: one to explain rank and the other to explain salary with an adjustment for the rank. The authors then apply this estimator to the salary determination process at the University of Minnesota.

Levin, Winkler, and Stephan ask whether foreign-born doctoral scientists in the U.S. workplace "displace" native-born talent. They compare the employment patterns of U.S. citizens and immigrant doctorates in science and engineering (S and E) over 1973-91. The authors find that U.S. citizens have fewer jobs in academia

within S and E not only because they are "displaced" but also because they are experiencing slower growth than the immigrant component of the doctoral population. They also find that both immigrant and U.S. citizen doctorates have been similarly disadvantaged in terms of employment in academia within the S and E sector. Overall, however, U.S. citizens fared relatively worse than their immigrant counterparts and have been displaced. That displacement appears to be concentrated among S and E doctorates trained in math/computer sciences, physics/astronomy, and engineering. However, U.S. citizens have fared relatively better than their immigrant counterparts in holding appointments other than postdoctorates or tenure-track appointments.

Asset Pricing

Members and guests of the NBER's Program on Asset Pricing met in Chicago on November 5. Program Director John H. Cochrane of the University of Chicago chose the following papers for discussion:

George Chacko, Harvard University, and **Luis M. Viceira**, NBER and Harvard University, "Dynamic Consumption and Portfolio Choice with Stochastic Volatility in Incomplete Markets" (NBER Working Paper No. 7377)
Discussant: Michael W. Brandt, NBER and University of Pennsylvania

Anthony W. Lynch, New York University, "Portfolio Choice and

Equity Characteristics: Characterizing the Hedging Demands Induced by Return Predictability"

Discussant: Jessica Wachter, Harvard University

Gregory R. Duffee, University of California, Berkeley, "Forecasting Future Interest Rates: Are Affine Models Failures?"

Discussant: Michael Johannes, University of Chicago

Owen Lamont, NBER and University of Chicago, and **Christopher Polk**, Northwestern University, "The Diversification Discount: Cash Flows versus Returns" (NBER Working Paper No. 7396)

Discussant: Narasimhan Jegadeesh, University of Illinois

Martin Lettau and **Sydney C. Ludvigson**, Federal Reserve Bank of New York, "A Cross-Sectional Test of Linear Factor Models with Time-Varying Risk Premiums"

Discussant: Ravi Jagannathan, NBER and Northwestern University

Nicholas Barberis, NBER and University of Chicago; **Ming Huang**, Stanford University; and **Tano Santos**, University of Chicago, "Prospect Theory and Asset Prices" (NBER Working Paper No. 7220)

Discussant: Kent D. Daniel, NBER and Northwestern University

Chacko and Viceira ask what the optimal savings and portfolio allocations are for long-horizon investors

when the variation in stock return volatility is predictable. They find that the optimal portfolio demand for

stocks varies with investors' risk aversion, but only slightly with their willingness to substitute consumption for

investment. By contrast, the optimal level of savings relative to wealth depends on both risk aversion and willingness to substitute consumption for saving. For long-horizon, risk-averse investors it is optimal to reduce portfolio holdings of stocks when changes in return volatility are negatively correlated with excess stock returns. This helps investors to hedge their exposure to volatility risk. The magnitude of the reduction in portfolio demand increases with the size of the correlation and, more importantly, with the persistence of changes in volatility. For the U.S. stock market, the correlation is negative and large, and low-frequency shocks to volatility are highly persistent, the authors find,

Lynch examines portfolio allocation across equity portfolios formed according to size, book-to-market value, and the like. He assesses the impact of return predictability on portfolio choice for an investor whose relative risk aversion coefficient is 4. Return predictability with dividend yield causes this investor early in life to tilt away from both high book-to-market stocks and small stocks. The investor wants to short-sell a low book-to-market portfolio in order to hold a high book-to-market portfolio. Lynch also calculates the utility cost of using a value-weighted equity index or of ignoring predictability. Investors who use a value-weighted equity index would give up a much larger fraction of their wealth to have access to book-to-market portfolios instead of stock portfolios formed on the basis of size. Finally, Lynch finds that investors would give up a much larger fraction of their wealth to have access to dividend

yield information instead of term spread information, but that term spread does have incremental benefits over and above using dividend yield alone.

Duffee finds that the class of affine models typically studied does a poor job of forecasting future changes in Treasury yields. He contends that better forecasts are produced by assuming that yields are Martingales. The failure of these models is driven by one of their key features: the compensation that investors receive for facing risk is a multiple of the variance of the risk. This means that risk compensation cannot vary independently of interest rate volatility. Duffee also estimates a class of models that is broader than the affine class. These "essentially affine" models retain the tractability of the standard affine class but allow the compensation for interest rate risk to vary independently from interest rate volatility. This additional flexibility proves useful in forming accurate forecasts of future yields.

Lamont and **Polk** study diversified firms and find that for discount firms, the whole is less than the sum of the parts; for premium firms, the whole is greater. These differences in value must be attributable to differences in either future cash flows or future returns. The authors find that the expected returns on securities of diversified firms vary systematically with relative value. Discount firms have significantly higher subsequent returns than do premium firms. Slightly more than half of the cross-sectional variation in excess values is attributable to variation in expected future cash flows, with the remainder attributable to variation in expected

future returns and to co-variation between cash flows and returns.

Lettau and **Ludvigson** ask if theoretically based asset pricing models such as the CAPM and the consumption CAPM—referred to jointly as the (C)CAPM—can explain the cross section of average stock returns. Central to their approach is a variable that proxies for fluctuations in the log consumption-aggregate wealth ratio and is probably important for summarizing conditional expectations of excess returns. They demonstrate that such conditional factor models can explain a substantial fraction of the cross-sectional variation in portfolio returns. These models perform much better on portfolios sorted by size and book-to-market ratios than unconditional (C)CAPM specifications and about as well as the three-factor Fama-French model. This CAPM specification can account for the difference in returns between low and high book-to-market firms and shows no sign of residual size or book-to-market effects.

Barberis, Huang, and Santos study asset prices in an economy where investors care about fluctuations in the value of their financial wealth more than is justified by a concern about consumption alone. Their framework can be helpful in explaining the mean, volatility, and predictability of stock returns. In contrast to consumption-based models, the authors also predict that stock returns will be only weakly correlated with consumption. Their model's design is influenced by prospect theory and by experimental evidence on the effect of prior outcomes on risky choice.

Labor Studies Program

The NBER's Program on Labor Studies held its fall meeting in Cambridge on November 5. Program Director Richard B. Freeman and Lawrence F. Katz, both of NBER and Harvard University, organized this program.

Brigitte C. Madrian, NBER and University of Chicago, and **Dennis Shea**, University of Chicago, "The Power of Suggestion: Inertia in 401(K) Participation and Savings Behavior"

David H. Autor, NBER and MIT, "Outsourcing at Will: Unjust

Dismissal Doctrine and the Growth of Temporary Help Employment"

Chinhui Juhn, NBER and University of Houston; **Dae-Il Kim**, Seoul National University; and **Francis Vella**, Rutgers University, "The Expansion of College Education in the United States, 1940-90: Is There Evidence of Declining Cohort Quality?"

Edward P. Lazear, NBER and Stanford University, "Educational Production" (NBER Working Paper No. 7349)

Jeffrey Grogger, NBER and

University of California, Los Angeles, and **Charles Michalopoulos**, Manpower Development Research Corp, "Welfare Dynamics under Time Limits" (NBER Working Paper No. 7353)

John DiNardo, NBER and University of California, Irvine, and **Mark P. Moore**, University of California, Irvine, "The Phillips Curve Is Back? Using Panel Data to Analyze the Relationship between Unemployment and Inflation in an Open Economy" (NBER Working Paper No. 7328)

Madrian and Shea examine how both economic and noneconomic factors affect people's savings decisions. Using data from a large U.S. company, they show that 401(K) participation and other investment decisions vary tremendously with the way that the options are presented. For example, 401(K) participation is much higher when participation, rather than nonparticipation, is the default. A substantial fraction of 401(K) participants stick to the default contribution rate and fund allocation, although very few employees who are forced to choose among the full menu of options would have picked this particular outcome. The authors' results have important implications for the optimal design of 401(K) savings plans as well as for any type of Social Security reform that includes personal accounts over which individuals have some amount of control.

Between 1979 and 1995, the temporary help supply (THS) industry grew at 11.2 percent annually, over five times more rapidly than U.S. nonfarm employment. During these same years, courts in 45 states adopted exceptions to the common law doctrine of employment at will,

thereby limiting employers' discretion to terminate workers and opening them to potentially costly litigation. **Autor** assesses whether these two phenomena—the decline of employment at will and the rapid growth of THS—are causally related. By exploiting variation in the timing of state court decisions recognizing three classes of exception to the at-will doctrine, **Autor** explores whether THS employment grew disproportionately in states and times after the doctrine was amended. His analysis indicates that adoption of the "implied contract" exception has had a sizable and robust impact on THS employment, while the public policy exception and the implied covenant of good faith and fair dealing do not appear to have had significant impacts on THS. He concludes that, because of court restrictions limiting unjust dismissal, roughly 300,000 to 400,000 additional workers were employed in THS on a daily basis as of 1998.

Juhn, Kim, and Vella document the increase in educational attainment of the U.S. population between 1940 and 1990. They ask how the increase in the number of college graduates may have affected their rel-

ative wages via a decline in average ability. The authors begin by introducing a simple human capital model in which individuals have varied abilities and face a variety of borrowing costs. Using the Census data, they find some weak evidence that male college graduates from highly educated cohorts earn a relatively smaller college premium, even after controlling for the relative supply effect. However, these cohort quality effects are much less important than changes induced by aggregate demand shocks and account for only a small fraction of the recent fluctuations in the college premium.

Lazear considers a number of issues related to class size: 1) its effects are difficult to find except when variations in class size are truly exogenous; 2) Catholic schools have larger classes but better performance records than public schools; 3) class size is more important for disadvantaged children; and 4) when many students have joined a class recently, those who join and their classmates do worse. He finds that because the optimal class size is larger for well-behaved students, the observed relation of educational output to class size is small or even positive. How-

ever, increasing class size to ranges away from equilibrium levels will adversely affect educational output, and class size effects are more significant in small classes than large ones. An analysis that substitutes discipline for class size may explain why Catholic schools, with their large classes, outperform public schools and why class size effects are larger for problem children than for well-behaved children. Private schools, which charge tuition and compete with free public schools, attract better students, and this may account for Catholic schools outperforming public schools even though the former's expulsion rates are lower. Additionally, teachers may prefer smaller classes either because wages do not reflect working conditions fully or because teachers as a group can raise the demand for their services by decreasing class size. Finally, because public schools that operate in a centralized environ-

ment do not capture the returns to their successes, public school incentives differ from those of private schools.

Groger and Michalopoulos analyze a simple model in which potential welfare recipients choose how to allocate their time-limited endowment of benefits so as to maximize their expected lifetime utility. Not surprisingly, the model reveals that time limits provide an incentive for welfare recipients to conserve, or bank, their benefits. Further, the incentive to conserve one's benefits varies inversely with the age of the youngest child in one's family. This implies that the reduction in welfare payments that results from the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 will fall disproportionately on families with young children. The authors use data from Florida and confirm that time limits reduce welfare use by the

greatest amount among the families with the youngest children. Moreover, time limits have substantial effects on welfare use, reducing the probabilities of monthly use by 19 percent. Time limits lead families to exit the welfare rolls well before they exhaust their benefits.

DiNardo and Moore extend the Phillips Curve to an open economy and estimate the textbook "expectations augmented" Phillips Curve with a market-based and observable measure of inflation expectations. Then, using quarterly data from nine OECD countries and the simplest econometric specification, they estimate the Phillips Curve with the same functional form for the 1970s, 1980s, and 1990s. Their results suggest that although changing expectations played a role in creating the empirical failure of the Phillips Curve in the 1970s, supply shocks were at least as important.

Monetary Economics Program

Members and guests of the NBER's Program on Monetary Economics, directed by N. Gregory Mankiw, NBER and Harvard University, met in Cambridge on November 12. Organizers Christopher L. Foote, Harvard University, and Stephen P. Zeldes, NBER and Columbia University, chose these papers for discussion:

Michael T. Kiley, Federal Reserve Board, "Computers and Growth with Costs of Adjustment: Will the Future Look like the Past?"

Discussant: Kevin Stiroh, Federal Reserve Bank of New York

Michael S. Hanson, Wesleyan University, "On the Identification of

Monetary Policy: The 'Price Puzzle' Reconsidered"

Discussant: Charles Evans, Federal Reserve Bank of Chicago

Lars E.O. Svensson and **Michael Woodford**, NBER and Princeton University, "Implementing Optimal Policy through Inflation-Forecast Targeting"

Discussant: Peter N. Ireland, NBER and Boston College

Fernando Alvarez, NBER and University of Chicago; and **Andrew Atkeson** and **Patrick J. Kehoe**, Federal Reserve Bank of Minneapolis, "Money and Interest Rates with Endogenously Segmented

Markets" (NBER Working Paper No. 7060)

Discussant: Dean Corbae, University of Pittsburgh

Marjorie Flavin, NBER and University of California, San Diego, and **Takashi Yamashita**, Deloitte and Touche, LLP, "Owner-Occupied Housing and the Composition of the Household Portfolio" (NBER Working Paper No. 6839)

Discussant: N. Gregory Mankiw
Andrew Caplin, NBER and New York University, and **John V. Leahy**, NBER and Boston University, "The Social Discount Rate"
Discussant: David Laibson, NBER and Harvard University

Kiley augments the traditional growth accounting framework by in-

cluding a common specification of investment adjustment costs. He uses

this framework to examine the past and likely future growth in nonfarm

business output in the United States. The inclusion of adjustment costs can have large effects on the growth-accounting exercise when a new investment good is introduced, as has been the case with computers in the past 30 years. The author's framework indicates that the contribution of computers to economic growth has been held down by the large adjustment costs required to incorporate a new investment good into the economy's capital stock. These adjustment costs may have lowered measured growth in multifactor productivity since 1974 by about half a percentage point—a nontrivial portion of the productivity slowdown. Combining the adjustments to multifactor productivity and the impact of computers implied by Kiley's model boosts long-run growth in output per hour by 0.75 percentage points above its 1974–91 average.

A large literature has used structural vector autoregressive (SVAR) models to investigate the empirical effects of U.S. monetary policy. Many of these models regularly produce a “price puzzle”—a rise in the aggregate price level in response to a contractionary innovation to the “exogenous” component of monetary policy—unless commodity prices are included. Conventional wisdom maintains that commodity prices resolve the price puzzle because they contain information that helps the Federal Reserve to forecast inflation. **Hanson** examines a number of plausible alternative indicator variables and finds little correlation between an ability to forecast inflation and an ability to resolve the price puzzle. A subsample investigation reveals that

evidence of a price puzzle is associated primarily with the 1959–79 sample period, and that none of the indicators studied—including commodity prices—resolve the puzzle over this period. Variation in the monetary policy reaction function across subsamples may contribute to this finding.

Svensson and **Woodford** examine the extent to which variants of inflation-forecast targeting can avoid stabilization bias, incorporate history dependence, and achieve determinacy of equilibrium, so as to reproduce the socially optimal equilibrium under commitment. They also evaluate these variants in terms of their transparency and robustness. A suitably designed inflation-forecast targeting rule can achieve the social optimum and at the same time be both more transparent and more robust than competing instrument rules.

Alvarez, Atkeson, and Kehoe analyze the effects of open market operations on interest rates if economic agents must pay a fixed cost to exchange assets and cash. Asset markets are segmented in that some agents choose to pay the fixed cost and some do not. When the fixed cost is zero, persistent money injections will increase interest rates, flatten the yield curve, and lead to a downward sloping yield curve on average. In contrast, if markets are sufficiently segmented, then persistent money injections decrease nominal interest rates, steepen or even twist the yield curve, and lead to an upward sloping yield curve on average.

Flavin and **Yamashita** study the impact of the portfolio constraint

imposed by the consumption demand for housing on the optimal holdings of financial assets. During periods of time when the household chooses not to sell the current house, the ratio of the current house value to total wealth places a constraint (called the “housing constraint”) on the portfolio optimization problem. Using data from the Panel Study on Income Dynamics and Case-Shiller's repeat sales transaction prices, the authors estimate expected returns and the covariance matrix for housing, mortgages, stocks, Treasury bonds, and T-bills. They conclude that since the ratio of housing to net worth declines as the household accumulates wealth, the housing constraint will induce a lifecycle pattern in the portfolio shares of stocks and bonds. Further, the inclusion of housing alters the risk and return tradeoff in such a way that most households are at a corner with respect to T-bills. This helps to explain cross-sectional data on household portfolios.

In welfare theory it is standard to pick the consumption stream that maximizes the welfare of the representative agent. **Caplin** and **Leahy** argue against this position, and show that a benevolent social planner will generally place a greater weight on future consumption than does the representative agent. They apply their framework to the standard Ramsey growth model and show how the modified golden rule must itself be modified to find the socially optimal savings rate. In a focal case, the social discount rate is one-third of the private discount rate.

Macroeconomics and Individual Decisionmaking

George A. Akerlof, University of California, Berkeley, and Robert J. Shiller, NBER and Yale University, organized a meeting on "Macroeconomics and Individual Decisionmaking," which was held at the NBER's Cambridge office on November 13. The following papers were discussed:

Christopher L. Foote, NBER and Harvard University; **Warren C. Whatley**, University of Michigan; and **Gavin Wright**, Stanford University, "Arbitraging a Discriminatory Labor Market:

Black Workers at the Ford Motor Company, 1918-47"

Discussant: Truman Bewley, Yale University

Ernst Fehr and **Lorenz Goette**, University of Zurich, "How Robust Are Nominal Wage Rigidities?"

Discussant: Beth Anne Wilson, Federal Reserve System

Michael Kremer, NBER and Harvard University, "An Epidemiological Model of Unions"

Discussant: Michael Piore, MIT

Roland Benabou, NBER and Princeton University, and **Jean**

Tirole, MIT, "Self-confidence: Intrapersonal Strategies"

Discussant: David Laibson, NBER and Harvard University

George A. Akerlof, and **Rachel E. Kranton**, University of Maryland, "Economics and Identity"

Discussant: Andrei Shleifer, NBER and Harvard University

Laurence M. Ball, NBER and Johns Hopkins University, "Near-Rationality and Inflation in Two Monetary Regimes"

Discussant: John Shea, NBER and University of Maryland

Discrimination against black workers provides an opportunity for a firm to "arbitrage" the labor market, by hiring blacks at low wages in order to increase profits. **Foote**, **Whatley**, and **Wright** use the personnel records of the Ford Motor Co. before World War II to examine one important historical example of this. Ford was unique in the prewar auto industry both in the number of blacks it hired and in the types of jobs that many of these workers performed. Yet company records show that blacks earned virtually the same amount as whites. Ford's main arbitrage margin appears to have been working conditions, since black workers were disproportionately represented in the most disagreeable jobs at the firm. Blacks who held less disagreeable jobs, though, still made the same amount as whites, and these workers seem to have valued their jobs very highly. The implication is that equity in observed wages among blacks and whites was an important component of Ford's arbitrage strategy.

Several studies have indicated that firms are reluctant to cut nominal wages during periods of relatively *high* nominal growth in per capita

GDP; however, in an environment with *low* nominal growth in per capita GDP, firms seem not to hesitate to cut nominal pay. Using data from Switzerland, where nominal GDP growth was very low between 1991 and 1997, **Fehr** and **Goette** discredit these studies and show that the rigidity of nominal wages is a robust phenomenon which does not vanish, but actually increases, as inflation decreases. Nominal wage rigidity in that way is a considerable obstacle to real wage adjustments. The authors estimate that wage rigidity is almost complete for full-time workers who stay in their jobs, but virtually nonexistent for workers who switch jobs. The estimates from their model of wage changes imply that, in the absence of downward nominal rigidity, real wages would be quite responsive to unemployment.

Kremer applies epidemiological techniques to the study of unions. His model implies that: industries with high turnover of firms will have low unionization rates; democratic unions that maximize the welfare of current members will be displaced in evolutionary competition by less democratic unions with more moder-

ate wage demands; this tendency toward moderation will be weaker in European countries where multiple unions compete for the same workers within firms; unionization levels will be subject to rapid spurts followed by gradual declines; and there may be one equilibrium with high unionization and long-lived firms and another with low unionization and short-lived firms. These predictions, according to the author, seem broadly consistent with the data.

Benabou and **Tirole** build a model of self-confidence in which people have imperfect knowledge about their ability. In a first application of the model, they find that to avoid a negative inference about their ability, people may deliberately impair their performance or may choose overambitious tasks. Another application of the model yields "selective memory" or awareness management: people are more likely to remember or to consciously acknowledge their successes than they are their failures. The authors show that this "psychological immune system" typically leads to multiple equilibriums in information processing strategies, self-confidence, and behavior.

Akerlof and **Kranton** consider how identity, or a person's sense of self, affects economic outcomes. They incorporate the psychology and sociology of identity into an economic model of behavior. Identity is associated with different social categories and how people in these categories should behave. The authors then construct models showing how identity can affect individual interactions. They adapt these models to gender discrimination in the workplace, the economics of poverty and

social exclusion, and the household division of labor. In each case, the inclusion of identity substantively changes the conclusions reached in previous economic analyses.

Most models of inflation dynamics assume that price setters have either fully rational or backward-looking expectations. **Ball** considers an intermediate case, "near-rational" expectations. Specifically, price setters use information about past inflation rationally, but they ignore information about other variables such as output

and interest rates. **Ball** considers two periods in U.S. history with different inflation dynamics: the period since 1960, and the gold-standard period from 1879 through 1914. Under the assumption of near-rational expectations, **Ball's** model is consistent with the behavior of inflation in both eras. In contrast, his model is rejected for at least one period under both rational expectations and backward-looking expectations.

Public Economics Program

Members and guests of the NBER's Program on Public Economics met in Cambridge on November 18. Program Director James M. Poterba, NBER and MIT, organized the meeting and this program.

Bruce D. Meyer, NBER and Northwestern University, "Do the Poor Move to Receive Higher Welfare Benefits?"

Discussant: Julie B. Cullen, NBER and University of Michigan

Alan J. Auerbach, NBER and University of California, Berkeley, and **Daniel R. Feenberg**, NBER,

"The Significance of Federal Taxes as Automatic Stabilizers"

Discussant: J. Karl Scholz, NBER and University of Wisconsin

B. Douglas Bernheim, NBER and Stanford University,

Lorenzo Forni, Boston University,

Jagadeesh Gokhale, Federal Reserve Bank of Cleveland, and **Laurence J. Kotlikoff**, NBER and Boston University, "The Adequacy of Life Insurance: Evidence from the Health and Retirement Survey" (NBER Working Paper No. 7372)

Discussant: Jeffrey Brown, NBER and Harvard University

James M. Poterba, and **Andrew A. Samwick**, NBER and Dartmouth College, "Taxation and Household Portfolio Composition: U.S. Evidence from the 1980s and 1990s" (NBER Working Paper No. 7392)

Discussant: Julie H. Collins, NBER and University of North Carolina

Jonathan Gruber, NBER and MIT, and **Emmanuel Saez**, NBER and Harvard University, "The Elasticity of Taxable Income: Evidence and Implications" (NBER Working Paper No. 7512)

Discussant: Austan Goolsbee, NBER and University of Chicago

Using 1980 and 1990 U.S. Census data, **Meyer** asks whether individuals "migrate" in order to collect welfare. He uses several different techniques to examine the evidence for welfare-induced migration, including some new methods based on comparison groups. He then combines the ideas of these methods with a model that relies on comparisons of the attributes of possible locations. All the different methods point toward the same result: there is welfare-induced migration, but it is modest in magnitude.

Despite the many changes in the

U.S. economy and its tax system since the early 1960s, there has been relatively little net change in the role of the tax system as an automatic stabilizer. **Auerbach** and **Feenberg** estimate that the tax system's effectiveness at stabilizing aggregate demand was nearly as high in 1995 as it was at its estimated peak in 1981. In fact, the current impact is slightly higher than it was in the early 1960s, when people in the top marginal income tax bracket faced a tax rate of 91 percent. The authors estimate that perhaps 10 percent of initial

shocks to income may be offset by tax-induced consumption responses; this is probably the most important source of automatic stabilization of aggregate demand. However, **Auerbach** and **Feenberg** also suggest that the progressive income tax may stabilize output via aggregate supply, and that this effect may be of similar magnitude.

Bernheim, **Forni**, **Gokhale**, and **Kotlikoff** evaluate the adequacy of life insurance among married American couples approaching retirement. They use recent, high-quality data by

household (from the 1992 Health and Retirement Survey [HRS] with matched Social Security earnings histories) and new financial planning software. The authors find that a sizable minority of couples in the HRS sample are significantly underinsured: almost one-third of wives and more than 10 percent of husbands would have suffered living standard reductions of 20 percent or more had their spouses died in 1992. Underinsurance tends to be more common among low-income households, couples with dissimilar levels of earnings, younger households, couples with dependent children, and non-whites. Among some groups, more than two-thirds are underinsured. The frequency of severe underinsurance—a reduction in standard of living by 40 percent or more—exceeds one-quarter among some groups.

Poterba and **Samwick** explore the relationship between household marginal income tax rates, the set of

assets that households own, and the portfolio shares accounted for by each of these assets. They analyze data from the 1983, 1989, 1992, and 1995 Surveys of Consumer Finances and develop a new algorithm for imputing federal marginal tax rates to households in these surveys. They find that a household's marginal tax rate has an important effect on its asset allocation decisions. The probability that a household owns tax-advantaged assets is strongly related to its tax rate on ordinary income. In addition, the amount of investment through tax-deferred accounts, such as 401(K) plans and IRAs, is an increasing function of the household's marginal tax rate. Holdings of corporate stock, which is taxed less heavily than interest-earning assets, and of tax-exempt bonds also increase with the household's marginal tax rate. Holdings of heavily taxed assets, such as corporate bonds and interest-bearing accounts, decline as a share

of wealth as a household's marginal tax rate increases.

Gruber and **Saez** estimate the overall elasticity of taxable income by using a long panel of tax returns that encompass a series of tax reforms throughout the 1980s. This strategy allows them to provide new evidence on the variation in the elasticity of taxable income by income group. They find that the overall elasticity of taxable income is approximately 0.43; the elasticity of real income, not including tax preferences, is much lower. They also estimate that this overall elasticity is primarily attributable to a very elastic response of taxable income for taxpayers who have high real incomes: their elasticity is more than 0.5. For those with incomes below \$100,000 per year, the elasticity is less than half as large. Moreover, high-income taxpayers who itemize are particularly responsive to taxation.

Corporate Finance Program Meeting

The NBER's Program on Corporate Finance, directed by Raghuram Rajan, NBER and University of Chicago, met in Chicago on November 19. David S. Scharfstein, NBER and MIT, organized this program:

Lucian A. Bebchuk, NBER and Harvard University, "A Rent-Protection Theory of Corporate Ownership and Control" (NBER Working Paper No. 7203)

Discussant: Denis Gromb, MIT

Rafael La Porta, **Florencio Lopez-de-Silanes**, and **Andrei Shleifer**, NBER and Harvard University, and **Robert W. Vishny**, NBER and University of Chicago, "Investor

Protection and Corporate Valuation" (NBER Working Paper No. 7403)

Discussant: Luigi Zingales, NBER and University of Chicago

Zsuzsanna Fluck, New York University, "Capital Structure Decisions in Small and Large Firms: A Lifecycle Theory of Financing"

Discussant: Douglas W. Diamond, NBER and University of Chicago

Ricardo J. Caballero, NBER and MIT, and **Mohamad L. Hammour**, Delta, "The Cost of Recessions Revisited: A Reverse-Liquidationist View" (NBER Working Paper No. 7355)

Discussant: Adriano Rampini,

Northwestern University

Vojislav Maksimovic and **Gordon Phillips**, University of Maryland, "The Market for Corporate Assets: Who Engages in Mergers and Asset Sales and Are There Efficiency Gains?"

Discussant: Judith A. Chevalier, NBER and University of Chicago

Charles P. Himmelberg, Columbia University, and **R. Glenn Hubbard**, NBER and Columbia University, "Incentive Pay and the Market for CEOs: Theoretical and Empirical Determinants of Pay-for-Performance Sensitivities"

Discussant: Marianne Bertrand, NBER and Princeton University

Bebchuk develops a theory of the structure of corporate ownership, and in particular of the choice be-

tween concentrated and dispersed ownership of corporate shares and votes. He studies the decision of the

initial owner of a company going public on whether to maintain a lock on corporate control, and he ana-

lyzes how this decision is influenced by the expected size of the private benefits of control. When these benefits are large and thus control is valuable, dispersed ownership would not constitute a stable equilibrium; there would be a reversion to concentrated ownership as a result of the acquisition of a control block by a rival or (defensively) by the incumbent. Thus, the initial owner would not choose such a structure to begin with but will maintain a lock on control and consequently on the rent of private benefits associated with it. Such a lock on control might be established using schemes that separate cash flow rights and voting rights, for example. Rent-protection considerations also can explain why initial owners taking a company public might make control partially contestable, as many U.S. companies often do, by adopting anti-takeover arrangements. Bebchuk's theory can explain the existing patterns of corporate ownership both cross-nationally and within particular parameters.

La Porta, Lopez-de-Silanes, Shleifer, and Vishny present a model of the effects on the valuation of firms of legal protection of minority shareholders and of cash flow ownership by a controlling shareholder. They then test this model using a sample of 371 large firms from 27 wealthy economies. Consistent with the model, they find evidence of higher valuation of firms in countries with better protection of minority shareholders. There is also some evidence that higher cash flow ownership by controlling shareholders benefits corporate valuation.

Fluck asks why firms choose very different capital structures in different stages of their lifecycles. She investigates whether firms' subse-

quent financing decisions are affected by the outcomes of previous financing decisions, and finds that firms' financing decisions do lead to different choices of securities. There will be equilibrium contracts that investors would reject for some small firm but will accept for an otherwise identical large firm (that is, a firm with identical projects). The set of the equilibrium financial contracts also differs in different stages of the firm's lifecycle: some contracts never sustainable for a small firm become sustainable for large firms. In addition to their own rights, holders of subsequent security issues may rely on the firm's existing investors to enforce their claims. Fluck suggests that there is a lifecycle pattern of financing in which firms will issue outside equity, short-term debt, or convertible debt first and then either use their retained earnings, issue longer-term debt, or issue outside equity to satisfy subsequent financing needs.

The observation that liquidations are concentrated in recessions has long been the subject of controversy. One view holds that liquidations are beneficial in that they result in increased restructuring. Another view holds that liquidations are privately inefficient and essentially wasteful. Examining gross job flows and financial and labor market rents, **Caballero** and **Hammour** find that, cumulatively, recessions result in reduced restructuring. This is likely to be socially costly, considering the inefficiencies on both the creation and destruction margins.

Using a large sample of plant-level data for 1974-92, **Maksimovic** and **Phillips** analyze the market for firms, divisions, and plants of manufacturing firms; they find an active market for corporate assets, with over 7 per-

cent of plants changing ownership through mergers, acquisitions, and asset sales during expansion years in the economy. Partial firm sales account for more than half of these transactions. The probability of asset sales and whole-firm transactions is related to firm organization and ex ante efficiency of buyers and sellers. The timing of sales and the pattern of efficiency gains suggest that the transactions that occur, especially through asset sales of plants and divisions, tend to improve the allocation of resources and are consistent with a simple neoclassical model of profit maximizing by firms. The decision to participate in the market for corporate assets and the subsequent gains realized from transactions are affected both by firm productivity and firm organization.

Himmelberg and **Hubbard** argue that the supply of highly skilled CEOs capable of running large, complex corporations is relatively inelastic, so shocks to aggregate demand for CEOs simultaneously raise firm value and the marginal value of CEO services to the firm. In equilibrium, such shocks bid up the value of their compensation packages. This phenomenon makes it appear as if some firms are violating relative performance evaluation (RPE). Using Standard and Poor's Execucomp data for a large panel of U.S. firms, the authors show that the empirical "failure" of RPE is systematically restricted to the CEOs of certain types of firms. The behavior of these firms in the bottom quartile of the size distribution is more in accordance with the predictions of agency theory. The authors see this as evidence that the supply of CEOs sufficiently skilled to manage such firms is relatively elastic.

Market Microstructure Project

Members and guests of the Market Microstructure Project gathered in Cambridge on December 3 to discuss their recent research. The meeting was organized by Tim Bollerslev, NBER and Duke University; Eric Ghysels, Pennsylvania State University; Bruce Lehmann, University of California, San Diego; Andrew W. Lo, NBER and MIT; Matthew Spiegel, Yale University; and Avanidhar Subramanyam, University of California, Los Angeles. The following papers were presented:

Robert F. Engle, NBER and University of California, San Diego, and **Asger Lunde**, University of Aalborg, "Trades and Quotes: A Bivariate Point Process"
Discussant: S. Viswanathan,

Duke University

Edith S. Hotchkiss, Boston College, and **Tavy Ronen**, Rutgers University, "The Informational Efficiency of the Corporate Bond Market: An Intraday Analysis"

Discussant: Arthur Warga, University of Houston

Michael A. Goldstein, University of Colorado, and **Kenneth A. Kavajecz**, University of Pennsylvania, "Liquidity Provision during Circuit Breakers and Extreme Market Movements"

Discussant: Maureen O'Hara, Cornell University

Martin D. D. Evans, Georgetown University, and **Richard K. Lyons**, NBER and University of California,

Berkeley, "Order Flow and Exchange Rate Dynamics"
(NBER Working Paper No. 7317)

Discussant: Francis X. Diebold, NBER and University of Pennsylvania

Tina Hviid Rydberg and **Neil Shephard**, Nuffield College, "BIN Models for Trade-by-Trade Data: Modeling the Number of Trades in a Fixed Interval of Time"

Discussant: Ian Domowitz, Pennsylvania State University

Joel Hasbrouck, New York University, "Trading Fast and Slow: Security Market Events in Real Time"

Discussant: Jeffrey Russell, University of Chicago

Engle and **Lunde** formulate a process for jointly analyzing transactions and the arrivals of quotes. In microstructure models, transactions may reveal private information that is then incorporated into new prices. The authors examine the speed of this information flow and the circumstances that govern it. They estimate models of stock trades and quotes for eight different stocks. They find that, for the arrival of price quotes, information flow variables—such as high transaction arrival rates, large volume per trade, and wide bid/ask spreads—all predict more rapid price revisions. This means that prices respond more quickly to trades when information is flowing; the price impacts of trades, and ultimately the volatility of prices, are high in such circumstances. When quote arrivals are included as well, the information variables—such as the volume and trade arrival rate and the level of spread—have a slowing or ambiguous effect on quote arrivals. This indicates that depth revisions

are relatively more frequent when the market is slower. One possible explanation for this is that depth quotes are derived directly from the limit order book, and that limit orders are submitted more cautiously when the market shows informational trading.

Using a unique dataset that includes daily and hourly high-yield bond transaction prices, **Hotchkiss** and **Ronen** examine the informational efficiency of the corporate bond market relative to the market for the underlying stock. They find that stocks do not lead bonds in reflecting firm-specific information. They further find that price behavior around earnings releases is incorporated quickly into both bond and stock prices, even at short return horizons. Finally, they find that measures of market quality are no poorer for the bonds in their sample than for the underlying stocks. The authors suggest that the relative informativeness of high-yield bond prices is driven largely by the bonds' liquidity

rather than the structure of the dealer market for corporate bonds.

On October 27, 1997, circuit breakers caused the NYSE to halt trading for the first time in history, as the Dow Jones Industrial Average (DJIA) lost 554 points. The next day the NYSE traded a record 1.2 billion shares as the DJIA increased by 337 points, the largest single-day point gain to date. Using data on the limit order books and specialists' quotes, **Goldstein** and **Kavajecz** examine liquidity provision by limit order traders and floor members during these extreme market movements. They find that specialists fulfilled their obligations to "lean against the wind" even though liquidity provision by limit order traders declined precipitously. In fact, limit order traders generally either remained inactive or withdrew liquidity during the trading halt.

Macroeconomic models of nominal exchange rates perform poorly. In sample, R2 statistics as high as 10 percent are rare; out of sample, these

models are typically out-forecast by a naive random walk. **Evans** and **Lyons** present a new kind of model that includes a determinant from the field of microstructure: order flow. Order flow is the proximate determinant of price in all microstructure models. This approach is strikingly successful in accounting for realized rates. The authors' model of daily exchange-rate changes produces R2 statistics above 50 percent. Out of sample, their model produces significantly better short-horizon forecasts than a random walk. For the Deutsche Mark-to-dollar spot market as a whole, the authors find that net dollar purchases of \$1 billion increase

the Deutsche Mark price of a dollar by about one pfennig.

Rydberg and **Shephard** propose a simple time-series model of the number of transactions made in intervals of a fixed number of seconds. They call this the BIN model. They then evaluate the properties of the BIN model and explore connections between this model and Cox processes; that is, Poisson processes with random intensities. They apply the modeling framework to data on trading of IBM shares.

Continuous security markets evolve as a sequence of timed events. **Hasbrouck** analyzes NYSE market data in which trading, quote revisions,

and orders are considered to constitute a stationary multivariate point process, which can be analyzed by standard time- and frequency-domain techniques. He finds that: 1) although occurrence intensities for different types of events are positively correlated, they are not characterized by the uniform proportionality that a strict sense of time deformation would require; 2) the frequencies and durations of informational epochs (periods of uncertainty and informational asymmetry) are highly variable; and 3) the correlation in arrivals of market orders and opposing limit orders is zero or negative over periods of 30 minutes or less.

Productivity Program

Members and guests of the NBER's Program on Productivity, directed by Ernst R. Berndt of MIT, met in Cambridge on December 3. Ariel Pakes, NBER and Harvard University, organized the meeting and chose the following papers for discussion:

Bart Hobijn, New York University, and **Boyan Jovanovic**, NBER and New York University, "The Information Technology Revolution and the Stock Market: Preliminary Evidence" (For a description of this paper, see "Economic Fluctuations and Growth" earlier in this section of the *Reporter*.)

Discussant: Erik Byrnejolfsson, MIT
Jose E. Galdon Sanchez, London

School of Economics, and **James A. Schmitz, Jr.**, Federal Reserve Bank of Minneapolis, "Threats to Industry Survival and Labor Productivity: World Iron-Ore Markets in the 1980s"

Discussant: James Tiebout, Pennsylvania State University

James D. Adams, NBER and University of Florida; **Eric P. Chiang**, University of Florida; and **Jeffrey L. Jensen**, Federal Reserve Bank of Cleveland, "Federal Laboratory R and D and the Performance of Industrial Laboratories"

Discussant: Adam B. Jaffe, NBER and Brandeis University

James A. Levinsohn, NBER and

University of Michigan, and **Amil Petrin**, University of Chicago, "Estimating Production Functions Using Intermediate Inputs to Control for Unobservables"

Discussant: Susanto Basu, NBER and University of Michigan

Andrew B. Bernard, NBER and Dartmouth College; **Jonathan Eaton** and **Samuel S. Kortum**, NBER and Boston University; and **J. Bradford Jensen**, U.S. Bureau of the Census, "Plants and Productivity in International Trade: A Ricardian Reconciliation"

Discussant: Nina Pavcnik, Dartmouth College

In the early 1980s, the world steel market collapsed. Since iron ore is used almost exclusively in steel production, many iron-ore mines had to be shut down. **Sanchez** and **Schmitz** find that in countries where mines faced no threat of closure, the iron-ore industry had little or no productivity gain over the decade. In coun-

tries where mines faced a large threat of closure, the industry typically had productivity gains ranging from 50 to 100 percent, gains that were unprecedented. The authors then show that these productivity increases were not driven by new technology or selection but by continuing to operate mines, using existing technology, and

by increasing the mines' productivity in order to stay in operation.

Adams, Chiang, and Jensen study the effect of federal laboratories on the performance of a sample of U.S. industrial laboratories. They find that Cooperative Research and Development agreements (or CRADAs) are the primary channel by which

federal laboratories affect the private laboratories. With a CRADA, the industrial laboratories tend to patent more, spend more on company-financed R and D, and work harder at learning about government research. Without a CRADA, the level of patenting stays about the same, and only federally funded laboratory R and D increases, mostly because of direct subsidies by the government. These results are consistent with the literature on endogenous R and D spillovers, which emphasizes that knowledge spills over when recipients work at making it do so. Because CRADAs are legal agreements that are backed by real budgets and accompanied by cost sharing that could bind the parties together in research, these agreements may be more beneficial to firms than other public-private interactions, precisely

because of the mutual effort they require of firms and government laboratories.

Levinsohn and **Petrin** introduce a new method for conditioning out serially correlated unobserved shocks to the production technology by proposing an alternate implementation of the ideas first developed in Olley and Pakes (1996.) The authors extend the idea of using investment to control for correlation between input levels and the unobserved firm-specific productivity process. They show that, like investment, intermediate inputs can also solve the simultaneity problem.

Bernard, Eaton, Kortum, and **Jensen** attempt to reconcile observations about plant-level exporting behavior with international trade theory and the aggregate volume of trade. Their framework extends the

basic Ricardian model to accommodate trade among many countries separated by trade frictions in an environment of imperfect competition. The model is made to fit the actual pattern of bilateral trade among all the nontrivial destinations for U.S. exports. The authors then ask how well the model can explain several basic facts about U.S. plants: 1) the wide dispersion of measured productivity across plants; 2) the higher measured productivity of exporters; 3) the small fraction of active producers who actually export; 4) the small fraction of revenue earned from exports even by those plants that do export; and 5) the much larger size of plants that export. Their methodology picks up the basic qualitative features and comes close to matching the relevant magnitudes.

Behavioral Finance Meeting

The NBER Group on Behavioral Finance held its fall meeting in Cambridge on December 9. Robert J. Shiller, NBER and Yale University, and Richard H. Thaler, NBER and University of Chicago, organized this program.

Joseph Chen and **Harrison Hong**, Stanford University, and **Jeremy C. Stein**, NBER and MIT, "Forecasting Crashes: Trading Volume, Past Returns, and Conditional Skewness in Stock Prices" Discussant: Kent Daniel, NBER and Northwestern University
Narasimhan Jegadeesh, University of Illinois, and **Sheridan**

Titman, NBER and University of Texas, "Profitability of Momentum Strategies: An Evaluation of Alternative Explanations" (NBER Working Paper No. 7159)

Discussant: Werner Debondt, University of Wisconsin

Malcolm Baker, Harvard University, and **Jeffrey Wurgler**, Yale University, "The Equity Share in New Issues and Aggregate Stock Returns"

Discussant: Robert J. Shiller

Shlomo Benartzi, University of California, Los Angeles, "Why Do Employees Invest Their Retirement Savings in Company Stock?"

Discussant: Andrei Shleifer, NBER and Harvard University

Brad M. Barber and **Terrance Odean**, University of California, Davis, "Online Investors: Do the Slow Die First?"

Discussant: Kenneth R. French, NBER and MIT

Randall Morck, Harvard University; **Bernard Yeung**, University of Michigan; and **Wayne Yu**, Queens University, "The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?"

Discussant: Kenneth A. Froot, NBER and Harvard University

Chen, Hong, and **Stein** investigate the determinants of asymmetries in stock returns. With a series of cross-sectional regression specifications, they attempt to forecast skewness in the daily returns of individual

stocks. Negative skewness is most pronounced in stocks that have experienced an increase in trading volume relative to trend over the prior six months and positive returns over the prior 36 months. The first finding

is consistent with a model predicting that negative asymmetries are more likely to occur when there are large differences of opinion among investors. The latter finding fits with a number of theories. Analogous re-

sults also obtain when the authors attempt to forecast the skewness of the aggregate stock market, although here their statistical power is limited.

Jegadeesh and **Titman** evaluate various explanations for the profitability of momentum strategies. Evidence indicates that momentum profits have continued in the 1990s, which suggests that the original results were not a product of data snooping bias. The authors also examine the predictions of recent behavioral models that propose that momentum profits are attributable to delayed overreactions that are eventually reversed. This supports the behavioral models, but this support should be taken with caution. Although the authors find no evidence of significant return reversals in the two to three years after the following formation date, there are significant return reversals four to five years after the formation date. The authors' analysis of post-holding period returns sharply rejects a claim in the literature that the observed momentum profits can be explained completely by the cross-sectional dispersion in expected returns.

The share of equity issues in total new equity and debt issues is a strong predictor of U.S. stock market returns between 1928 and 1997. In particular, firms issue relatively more equity than debt just before periods of low market returns. The equity share in new issues has stable predictive power in both halves of the sample period, and after controlling for other known predictors. **Baker** and **Wurgler** do not find support for efficient market explanations of the results. Instead, the fact that the

equity share sometimes predicts significantly negative market returns suggests inefficiency and that firms time the market component of their returns when issuing securities.

About one-third of the assets in large retirement savings plans are invested in company stock. From a diversification perspective, this is a dubious strategy. **Benartzi** offers a behavioral explanation: individuals excessively extrapolate past returns into the future. Consistent with the excessive extrapolation hypothesis, employees of firms that experienced the worst stock performance over the past 10 years have 10.37 percent allocated to company stock, while employees whose firms experienced the best stock performance have 39.70 percent allocated to company stock. The author also examines more traditional explanations of company stock holdings and finds that they can only explain part of the story. Results show that employees invest 20–30 percent of their discretionary funds in company stock (as opposed to being required to own company stock), and on average, employees are unable to predict the future performance of company stock. Thus, employees invest a nontrivial fraction of their discretionary funds in stocks that provide superior past performance but no superior future performance.

Barber and **Odean** examine changes in the stock trading behavior and investment performance of 1,607 investors who switched from phone-based to online trading between 1992 and 1995. They document that young men who are active traders with high incomes and a preference for invest-

ing in small growth stocks with high market risk are more likely to switch to online trading. They also find that those who switch to online trading experience unusually strong performance prior to going online, beating the market by more than 2 percent annually. After going online, they trade more actively, more speculatively, and less profitably than before—lagging the market by more than 3 percent annually. A rational response to reductions in market frictions (lower trading costs, improved execution speed, and greater ease of access) does not explain these findings. The increase in trading and reduction in performance of online investors can be explained by overconfidence augmented by self-attribution bias, the illusion of knowledge, and the illusion of control.

Stock prices move together more in low-income economies than in high-income economies. This finding is clearly not attributable to market size differences and is only partially explained by slightly higher fundamentals correlation in low-income economies. However, measures of a country's institutionalized respect for property rights do appear to explain these differences. **Morck**, **Yeung**, and **Yu** propose that weak private property rights impede informed trading and increase systematic noise trader risk. They also conjecture that, in countries that protect public investors poorly from corporate insiders, intercorporate income shifting may make firm-specific information less useful to risk arbitrageurs and therefore impede its capitalization into stock prices.

Japan Project

Members and guests of the NBER's Japan Project convened in Tokyo on December 15. Fumio Hayashi, NBER and University of Tokyo, and Anil K. Kashyap, NBER and University of Chicago, organized the meeting. The program was:

Heather Berry and **Mariko Sakakibara**, University of California, Los Angeles, "Resource Accumulation and Overseas Expansion by Japanese Multinationals: An Empirical Analysis of the Internalization Theory"
Discussant: Kyoji Fukao, Hitotsubashi University

Pinelopi K. Goldberg, NBER and Columbia University, and **Michael M. Knetter**, NBER and Dartmouth College, "International Rivalry in the Imaging Industry: Kodak v. Fuji"
Discussant: David Weinstein, NBER and University of Michigan

Hiroshi Ono, Stockholm School of Economics, "Does Examination 'Hell' Pay Off? The Cost-Benefit Analysis of College Education in Japan"
Discussant: Naohiro Yashiro, Sophia University
Joe Peek, Boston College, and **Eric S. Rosengren**, Federal Reserve

Bank of Boston, "Have Japanese Banking Problems Stifled Economic Growth?"

Discussant: Makoto Saito, Osaka University

Jun-Koo Kang, Michigan State University; **Anil Shivdasani**, University of North Carolina; and **Takeshi Yamada**, Hong Kong University of Science and Technology, "The Effect of Bank Relations on Investment Decisions: An Investigation of Japanese Takeover Bids"
Discussant: Takeo Hoshi, University of California, San Diego

Berry and **Sakakibara** explore the evolution of the value of multinationality to shareholders as a firm's level of international activity changes, and whether the accumulation of a firm's intangible assets actually precedes its investment abroad, as implied by the internalization theory. Using a sample of 141 Japanese manufacturing firms from 1974 to 1997, they find that shareholder valuation of foreign direct investment (FDI) changes as the level of a firm's international activity changes. Further, their finding that intangible assets Granger cause FDI supports the internalization theory.

Goldberg and **Knetter** use a variety of data sources to investigate whether and how competition in the consumer and commercial imaging business has changed in recent years. The main mechanism for identifying the degree of competition is fluctuations in real yen/dollar exchange rate, which generate changes in the relative cost of production between Kodak and Fuji. The authors find that Fuji has gained market power over time in the industry. Most indicators point to a corresponding decline in Kodak's market power and an in-

crease in Kodak's sensitivity to relative cost changes vis-à-vis Fuji.

The Japanese obsession over college prestige and the highly competitive college entry environment in Japan suggest that college quality plays a significant role in how individuals prepare for college. College-bound high school students undergo "examination hell," in which they spend years in addition to high school preparing for the college entrance examinations, typically, over 30 percent of students choose this "ronin" option. Using the mean scores on the entrance examinations of the colleges attended as a measure of college quality, **Ono** finds that college quality significantly improved the internal rate of return (IRR) among a sample of male college graduates in Japan. His results also suggest that rigorous exam preparation has no direct impact on earnings in and of itself, but only an indirect effect through its improvement in the quality of the college attended. He also shows that the IRR for intensive college preparation has diminishing returns. The improvement in college quality from intensive study improvement actually increases at a decreasing rate. On

average, one or two years of "ronin" will maximize the IRR.

A traditional "capital crunch," such as that experienced in the United States in the early 1990s, did not occur in Japan between 1992 and 1998. Poorly capitalized banks Japanese did not disproportionately cut back on loans, and overall lending did not decline dramatically. Nonetheless, **Peek** and **Rosengren** find that the banking problems in Japan stifled economic growth by misallocating rather than reducing credit. Just as the banks were slow to restructure, bank support for troubled and noncompetitive firms prevented the necessary restructuring of nonfinancial firms from occurring. Thus, the strong borrower-lender relationships in Japan insulated Japanese firms and prevented a capital crunch, but nonetheless stifled economic growth. An increasing share of bank credit was allocated to sectors of the economy that were least likely to use it productively.

Kang, **Shivdasani**, and **Yamada** study 154 domestic mergers in Japan that took place from 1977 to 1993. In contrast to U.S. evidence, it appears that Japanese mergers are viewed

favorably by investors of acquiring firms. The authors document a two-day abnormal return to the acquirer of 1.2 percent and for the duration of the takeover a return of 5.4 percent. Announcement returns are strongly

positively associated with the strength of the acquirer's relationships with banks. The benefits of bank relations appear to be greater for firms with poor investment opportunities and when the banking sector is healthy.

The authors conclude that close ties with informed creditors, such as banks, facilitate investment policies that enhance shareholder wealth.

Bureau Books

The following volumes may be ordered directly from the University of Chicago Press, Order Department, 11050 South Langley Avenue, Chicago, IL 60628-2215, 1-800-621-2736. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for all NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

Youth Employment and Joblessness in Advanced Countries

Youth Employment and Joblessness in Advanced Countries, edited by David G. Blanchflower and Richard B. Freeman, is available from the University of Chicago Press for \$68.50. Drawing on comparative data from Canada, Germany, France, Sweden, and the United Kingdom, the papers in this volume explore the effects of family background, education and training, social expectations, and crime on youth employment. This is one of a series of NBER books dealing with comparative labor markets. It should interest policymakers as well as academics.

Blanchflower is a Research Associate in the NBER's Programs on Labor Studies and Children and a professor in, and chair of, the Economics Department at Dartmouth College. Freeman is Director of the NBER's Program on Labor Studies and a Professor of Economics at Harvard University.

Issues in the Economics of Immigration

Issues in the Economics of Immigration, edited by George J. Borjas, is now available from the University of Chicago Press for \$55.00. This NBER Conference Report analyzes the economic consequences of immigration across the social spectrum, and thus should interest a wide range of readers. Exploring the repercussions of immigration on education, welfare, Social Security, and crime, as well as the labor market, these papers assess dimensions that traditional cost-benefit calculations do not take into account. They offer new insights into the kinds of economic opportunities and outcomes that immigrant populations might expect for themselves and future generations.

Borjas is a Research Associate in the NBER's Programs on Labor Studies and Children and the Pforzheimer Professor of Public Policy at the Kennedy School of Government at Harvard University.

Deregulation and Interdependence in the Asia-Pacific Region

Deregulation and Interdependence in the Asia-Pacific Region, edited by Takatoshi Ito and Anne O. Krueger, is available from the University of Chicago Press for \$78.00. Real and artificial barriers to international transactions have fallen sharply recently, causing a rise in the overall volume of international trade. East Asia has been particularly affected by the economic stresses and gains derived from deregulation. This volume explores the broadly similar experiences of certain economies in the region — China, Hong Kong, Japan, and Korea — in dealing with the potentially volatile process of deregulation. It also examines the East Asian response to a rapidly transforming economic environment, and should interest business and government professionals, as well as academic economists.

Ito is a Research Associate in the NBER's Program on International Finance and Macroeconomics and a Professor at the Institute of Economic Research at Hitotsubashi University. He is currently serving as Deputy Vice Minister for International Affairs at Japan's Ministry of Finance. Krueger is a Research Associate in the NBER's Programs on International Trade and Investment and International Finance

and Macroeconomics and the Herald L. and Caroline L. Ritch Professor of Economics at Stanford University.

Mergers and Productivity

Mergers and Productivity, edited by Steven N. Kaplan, is now available from the University of Chicago Press for \$40.00. This NBER Conference Report looks at high-profile mergers in a variety of industries. Focusing on specific acquisitions, it illustrates the range of contingencies involved in any merger attempt. The various authors establish each merger's presumed objectives and the potential costs and benefits of the acquisition, and they place this in the context of the broader industry. The contributors conclude that certain merger and acquisition activities were associated with technological or regulatory shocks, and that a merger's success or failure depends on the acquirer's thorough understanding of the target, its corporate culture, and its workforce and wage structures prior to acquisition.

These papers capture the richness, the complexity, and the economic intangibles inherent in contemporary merger activity. This volume will appeal to professionals in the corporate world, as well as to academics and students of economics.

Kaplan is a Research Associate in the NBER's Programs on Corporate Finance and Public Economics and the Neubauer Family Professor of Entrepreneurship and Finance at the University of Chicago's Graduate School of Business.

Wages and Labor Markets in the United States, 1820–60

Wages and Labor Markets in the United States, 1820–60, written by Robert A. Margo, is available from the University of Chicago Press for \$28.00. This is the latest volume in the NBER series on Long-Term Factors in Economic Development.

Research by economists and economic historians has greatly expanded our knowledge of labor markets and real wages in the United States since the Civil War, but the period from

1820 to 1860 has been studied far less. Margo fills this gap by collecting and analyzing the payroll records of civilians hired by the U.S. Army and information from the 1850 and 1860 U.S. Censuses of Social Statistics. He constructs new wage series for three occupational groups—common laborers, artisans, and white-collar workers—in each of the four major census regions—the Northeast, the Midwest, the South Atlantic, and the South Central—between 1820 and 1860, and also for California between 1847 and 1860. Margo then uses these data, along with previously collected evidence on prices, to explore a variety of issues central to antebellum economic development. This volume makes a significant contribution to economic history by presenting a vast amount of previously unexamined data in order to advance our understanding of the history of wages and labor markets in the antebellum economy.

Margo is a Research Associate in the NBER's Program on Development of the American Economy and Professor of Economics at Vanderbilt University.



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