NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

Reporter OnLine at: www.nber.org/reporter

FALL 2003

IN THIS ISSUE

Program Report:
Economic Fluctuations and Growth 1
Research Summaries:
"Capital Account Opening" 9
"Human Creativity" 12
Capital Income Taxes 16
NBER Profiles 19
Conferences 21
Bureau News 31
Bureau Books 36
Current Working Papers 37

Program Report

Economic Fluctuations and Growth

Robert E. Hall*

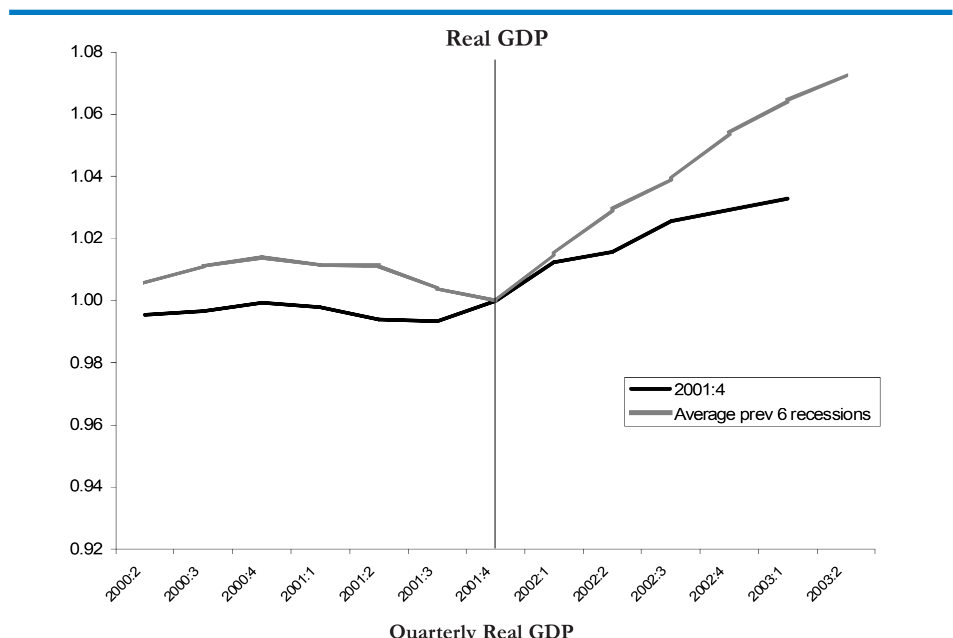
The NBER's Research Program on Economic Fluctuations and Growth marks its 25th anniversary this year. During the long U.S. economic expansion of the 1990s — the longest in the chronology maintained by the NBER — topics related to growth played a large role in the Program's activities. With the onset of a recession in early 2001, research on economic fluctuations has gained additional attention.

The Business Cycle Dating Committee

The EFG Program hosts the Business Cycle Dating Committee which carries out a long-standing function of the NBER, the maintenance of a chronology of the U.S. business cycle. The Bureau began compiling the chronology in the early 1920s; it now covers almost a century and a half of business-cycle history. I chair the committee, which also includes Martin Feldstein, Jeffrey A. Frankel, Robert J. Gordon, Christina D. Romer, David H. Romer, and Victor Zarnowitz.

On November 26, 2001, the committee announced that a recession had begun in the U.S. economy in March 2001. That is, a peak in economic activity occurred during March and the economy began to contract. A recession is a significant decline in activity spread across the economy, lasting more than a few months, visible in real gross domestic product, employment, and other indicators of activity. The committee determined in November 2001 that these conditions had been met.

On July 17, 2003, the committee announced that the recession had ended in November of 2001. The trough marked the end of the recession that began in March 2001 and the beginning of an expansion. The recession lasted eight months, which is slightly less than average for recessions since World War II. Real GDP has grown since the trough, as shown in the figure above.



Quarterly Real GDP
The dark line shows the movement of quarterly real GDP in 2000-2003 and the shaded line the average over the previous 6 recessions. Source: Bureau of Economic Analysis, U.S. Department of Commerce (http://www.bea.doc.gov/).

* *Hall is the director of the NBER Program on Economic Fluctuations and Growth and the Robert and Carole McNeil Professor of Economics at Stanford University.*

NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

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

President and Chief Executive Officer — *Martin Feldstein*
Vice President for Administration and Budget — *Susan Colligan*
Controller — *Kelly Horak*

BOARD OF DIRECTORS

Chairman — *Michael H. Moskow*
Vice Chairman — *Elizabeth E. Bailey*
Treasurer — *Robert Mednick*

DIRECTORS AT LARGE

Peter Aldrich
Elizabeth E. Bailey
John Herron Biggs
Andrew Brimmer
John S. Clarkeson
Don R. Conlan
George Eads
Jessica P. Einhorn
Martin Feldstein
Jacob A. Frenkel
Judith M. Gueron
Robert S. Hamada
George Hatsopoulos
Karen N. Horn
Judy C. Lewent
John Lipsky
Laurence H. Meyer
Michael H. Moskow
Alicia Munnell
Rudolph A. Oswald
Robert T. Parry
Richard N. Rosett
Marina V. N. Whitman
Martin B. Zimmerman

DIRECTORS BY UNIVERSITY APPOINTMENT

George Akerlof, *California, Berkeley*
Jagdish W. Bhagwati, *Columbia*
Michael J. Brennan, *California, Los Angeles*
Glen G. Cain, *Wisconsin*
Ray C. Fair, *Yale*
Franklin Fisher, *MIT*
Saul H. Hymans, *Michigan*
Marjorie B. McElroy, *Duke*
Joel Mokyr, *Northwestern*
Andrew Postlewaite, *Pennsylvania*
Uwe Reinhardt, *Princeton*
Nathan Rosenberg, *Stanford*
Craig Swan, *Minnesota*
David B. Yoffie, *Harvard*
Arnold Zellner, *Chicago*

DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Richard B. Berner, *National Association for Business Economics*
Gail Fosler, *The Conference Board*
A. Ronald Gallant, *American Statistical Association*
Richard C. Green, *American Finance Association*
Thea Lee, *American Federation of Labor and Congress of Industrial Organizations*
Robert Mednick, *American Institute of Certified Public Accountants*
Angelo Melino, *Canadian Economics Association*
Jeffrey M. Perloff, *American Agricultural Economics Association*
John J. Siegfried, *American Economic Association*
Josh S. Weston, *Committee for Economic Development*
Gavin Wright, *Economic History Association*

The NBER depends on funding from individuals, corporations, and private foundations to maintain its independence and its flexibility in choosing its research activities. Inquiries concerning contributions may be addressed to Martin Feldstein, President & CEO, NBER 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. All contributions to the NBER are tax deductible.

The *Reporter* is issued for informational purposes and has not been reviewed by the Board of Directors of the NBER. It is not copyrighted and can be freely reproduced with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Preparation of the NBER *Reporter* is under the editorial supervision of Donna Zerwitz.

Requests for subscriptions, changes of address, and cancellations should be sent to *Reporter*, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. Please include the current mailing label.

The current recovery has not seen as high a growth rate of real GDP as in the average recovery. In addition, productivity has grown unusually rapidly during the recession and recovery. As a result, employment has continued to decline slightly during the recovery. In dating the trough, the committee relied on the tradition of the Bureau's business-cycle dating procedure that emphasized output as the measure of economic activity, rather than employment.

Research Meetings

The EFG Program holds three research meetings each year. Each meeting is organized by a pair of program members, who carry out a highly competitive selection process to find the six most suitable papers for the meeting. The opportunity to be considered is extended to a large group of potential participants. Almost all of the papers marking significant advances in modern macroeconomics during the past quarter century have appeared at these meetings.

Research Groups

Much of the activity of the EFG program occurs in its research groups. The groups meet during the NBER's Summer Institute in July in Cambridge and occasionally at other times and locations as well.

Economic Growth — *Charles I. Jones and Peter J. Klenow, Leaders*

This group conducts research on a range of subjects related to long-run economic performance. Its meetings focus on such topics as differences in income across countries, firm-level productivity growth, and technical progress over time, as illustrated by the following papers:

Based on a study of immigrants, Lutz Hendricks[1] presents new evidence on the sources of cross-country income differences. His estimates suggest that, for countries whose output per worker is below 40 percent of U.S. output per worker, less than half of that relative output gap can be attributed to human and physical capital.

Simon Djankov, Rafael La Porta, Florencio Lopez de Silanes, and Andrei Shleifer[2] present new data on the regulation of entry of start-up firms in 85 countries containing information on the number of procedures, official time, and official cost that a start-up must bear before it can operate legally. The official costs of entry are high in most coun-

tries, and could explain a portion of the sizable income differences across countries.

Daron Acemoglu, Simon Johnson, and James Robinson[3] study the interplay between growth and institutions. They show that the rise of Europe between 1500 and 1850 was driven primarily by cities along the Atlantic coast, especially by those engaged in colonialism and long-distance oceanic trade. The economic benefits from this trade strengthened the commercial class, leading to improvements in property rights and institutions that furthered Western European growth and the emergence of the modern world.

One widely held view is that competitive pressure can boost firm productivity, but the evidence to support this view is not plentiful. Jose Galdon-Sanchez and James Schmitz[4] therefore study the U.S. and Canadian iron-ore industries in the early 1980s. They find that an increase in domestic and international competition did lead to large gains in labor productivity at continuing mines producing the same products with the same technology. Tor Jakob Klette and Samuel Kortum[5] also study firm productivity, but they emphasize R and D rather than competition. Their research explains why R and D as a fraction of revenues is related strongly to firm productivity yet largely unrelated to firm size or growth.

Rodolfo Manuelli and Ananth Seshadri[6] study the lag between the introduction of technology and its adoption. According to the conventional wisdom, slow technology diffusion suggests some sort of friction, for example vintage physical capital, vintage human capital, or local informational externalities. Their work, based on the diffusion of tractors in the United States between 1910 and 1960, shows otherwise.

Consumption — *Orazio Attanasio, Christopher D. Carroll, and Jose Victor Rios-Rull, Leaders*

This research ranges from purely empirical studies using microeconomic data to purely theoretical analyses of dynamic stochastic general equilibrium models with uninsurable idiosyncratic risk.

Nicholas Souleles and his co-authors[7] use microeconomic data to show that the timing of a household's receipt of a tax rebate check has a very strong effect on the timing of household spending, contrary to the predictions of standard consumption theory.

Jonathan Heathcote, Kjetil Storesletten, and Gianluca Violante[8] explore the macroeconomic and welfare implications of the sharp rise in U.S. wage inequality over the last several decades. They show that if a substantial component of the increased wage variation is transitory but persistent, a standard optimizing model can reconcile the widening income distribution with a stable distribution of consumption across families.

Over the last few years several papers have examined why households in the uppermost part of the permanent income distribution save so much more than the typical household. Among the potential explanations explored have been: imperfect capital markets that require business ventures to be self-financed[9,10]; the risk of medical expenses that will not be covered by insurance[11]; and preferences that embody habit formation rather than the usual intertemporal separability[12].

Another persistent recent thread has been the importance of spending on durable goods. Brian Peterson[13] develops a theoretical model that generates strong cyclicality of spending on housing via an interaction between cyclical variations in uncertainty and the effect of uncertainty on spending when there are durable goods that can't be resold. Burcu Duygan[14] presents complementary microeconomic empirical work, showing that, controlling for the fall in income during the 1994 Turkish financial crisis, those consumers whose unemployment risk increased more cut their spending on durable goods by more. In previous years, Antonia Diaz and María José Luengo-Prado[15] argued that understanding the dynamics of durable goods ownership can substantially modify the interpretation of wealth inequality in microeconomic data. Also, Dirk Krueger and Jesus Fernandez-Villaverde[16] suggested that when the concentration of durable goods expenditures in the early years of the life cycle is taken into account, life-cycle patterns of total consumption of services are less steeply sloped than appears when only spending on nondurables and services are considered together.

Income Distribution and Macroeconomics — *Roland Benabou, Steven N. Durlauf, and Oded Galor, Leaders*

The marked rise in inequality in most developed countries over the past 20 years again has brought income distribution to the forefront of economists' and policymakers' concerns. NBER researchers have explored a wide range of issues related to the sources and consequences of inequality at both the national and international levels. This research group is notable for its combination of empiricists, theorists, and econometricians. The interactions across their research orientations have led to valuable cross-fertilization in individual research programs and to general progress on the broad issues that lie at the core of the group's interests.

The group devoted significant attention to three fundamental research avenues: 1) the identification of channels through which the distributions of income, human capital, and financial assets affect aggregate performance in the medium and long run, within and across countries; 2) the determinants of inequality itself, in terms of both exogenous shocks and sources of persistence; and 3) the role of political institutions and social conflict in the determination of cross-country growth differences, including the use of history in understanding contemporaneous economic issues.

For instance, Dilip Mookherjee and Debraj Ray[17] focus on credit market frictions and related principal-agent contractual imperfections. The authors identify general conditions under which poverty traps, resulting in persistent inequality and suboptimal output, can appear. On the empirical side, the often-nonlinear implications

of credit-constraint models for the relationship between inequality and growth have motivated research by Abhijit Banerjee and Esther Duflo.[18] They critically re-examine previous econometric studies of this relationship, particularly those using panel data. Francesco Casselli and Nicola Gennaioli[19] present a model of occupational choice with contractual imperfections. It attributes a significant fraction of the income gap between less developed, countries (LDCs) and advanced countries to a misallocation of talents, taking the form of a much higher share of family-owned firms in LDCs.

Mathias Thoenig and Thierry Verdier[20] present a model of how firms in developed countries respond to competition from low-wage countries with defensive skill-biased technological innovations that further exacerbate wage inequality. Michael Kremer and Eric Maskin[21] show how international trade and outsourcing lead to a rematching of workers of different skill levels across countries into different production structures or teams, thus explaining the simultaneous rise in earnings inequality in both the developed and the developing world. Taking a longer, historical perspective, Oded Galor and Andrew Mountford[22] show how the emergence of international trade in the nineteenth century, leading countries like India to specialize away from skill-intensive goods, delayed these countries' demographic transition by skewing fertility choices towards quantity rather than "quality" of children, and how this causes divergent growth performances.

There also has been work on social interactions and the macroeconomic implications of sorting, including a paper by Raquel Fernandez, Nazih Guner, and John Knowles,[23] that presents a model of marital sorting among men and women with different education levels. William Brock and Steven N. Durlauf[24] develop methods for studying neighborhood and peer effects. Among the empirical studies are a paper by William Easterly[25] on the dynamics of racial segregation in U.S. cities, and one by Jeffrey B. Liebman, Jeffrey R. Kling, and Lawrence F. Katz[26] on studying the effects of the Moving to Opportunity housing voucher program on the educational and labor market outcomes of children and adults in poor households.

On the political-economy side of macroeconomics work, the work includes a paper by Olivier J. Blanchard and Francesco Giavazzi[27] that examines how deregulation in goods and labor markets will affect unemployment and wage dynamics, in particular explaining recent movements in the labor share. Together with Thomas Philippon, Blanchard[28] also presents a study of how the dismantling of barriers to entry and capital mobility has eroded rents, with a positive effect on efficiency in the long run, but a possible adverse effect in the medium run in countries where learning by unions is slowest. Gilles-Saint Paul[29] develops a model of job creation and job destruction in a growing economy with embodied technical progress, and uses it to analyze the political support for employment protection legislations.

Another important line of inquiry — by John Hassler, Jose Rodriguez Mora, Kjetil Storesletten, and Fabrizio Zilibotti[30] — is why the welfare state is so different in Europe compared to the United States. Alberto Alesina and Eliana LaFerrara[31] use individual data to show how a person's support for redistributive policies is affected negatively by her perceived likelihood of moving up in the income distribution and by the extent to which she believes that American society offers equal opportunities to all.

The role of institutions in promoting or hindering growth has also been studied theoretically and empirically from a historical perspective. Daron Acemoglu, Simon Johnson, and James Robinson[32] provide evidence that among countries colonized by European powers, those that were relatively rich in 1500 are now relatively poor. They argue that this reversal of fortune reflects the introduction of institutions encouraging investment in regions that were previously poor. Oded Galor, Omer Moav, and Dietrich Vollrath[33] present a theory of the development process in which complementarity between human and physical capital leads powerful landlords to switch from opposing public education to supporting it.

Forecasting and Empirical Methods in Macroeconomics and Finance — *Mark W. Watson and Kenneth D. West, Leaders*

This group focuses on the development and assessment of econometric methods for use in empirical macroeconomics and finance, placing special emphasis on problems of prediction. It meets jointly with a group on forecasting, under the Committee on Econometrics and Mathematical Economics umbrella, with support from the National Science Foundation.

Recent meetings have discussed: methods and applications of factor models for macroeconomic forecasting and structural analysis; nonlinear forecasting models and methods; inference issues in models with persistent regressors; evaluating models using out-of-sample predictive accuracy tests; instrumental variable and GMM methods; and empirical asset pricing.

These papers use panel datasets with large cross-section and time dimensions. Ben Bernanke, Jean Boivin, and Piotr Eliasz[34] and Domenico Giannone, Lucrezia Reichlin, and Luca Sala[35] use factor models to study monetary policy in the United States. Policymakers at the Federal Reserve set interest rates after studying hundreds or even thousands of time series for clues about the current and future behavior of inflation and real activity. This means that the small vector autoregressions often used to study monetary policy may suffer from important omitted variables bias and thus yield misleading results about monetary policy.

The usual VAR methods cannot be used when the number of time series is large because the number of parameters in the VAR is proportional to the square of the number of series. Factor models can solve this problem. In these models, latent or unobserved factors are used to explain the co-movement of a set of time series. These factors can be used to summa-

rize the information in a large number of time series. The empirical analysis in the two papers just described is complementary. The first studies the effects of monetary policy shocks, and the second studies technology and aggregate demand shocks. The results suggest that during the Greenspan era, the Federal Reserve has raised interest rates in response to aggregate demand shocks, but has changed rates far less in response to technology shocks.

Jushan Bai[36] provides some important statistical foundations for the use of principal components. He shows that when the cross section is sufficiently large, the sampling error in the estimated factors can be ignored when carrying out many of the usual kinds of statistical inference, such as constructing confidence intervals for forecasts or standard errors on VAR impulse responses. Bai's work along with the work of others in this group set the stage for a much broader use of structural factor models in macroeconometrics.

The Labor Market in Macroeconomics — *Richard Rogerson, Robert Shimer, and Randall Wright, Leaders*

The labor market is central to many issues in macroeconomics, including business cycles, unemployment, inequality, and growth. This group's research ranges from foundational work on model building, to quantitative evaluation of models, substantive policy evaluation, and data description.

The idea that trading frictions play an important role in shaping aggregate labor market outcomes has become increasingly standard over the past years. The early work of Peter A. Diamond, Dale Mortensen, and Christoper Pissarides has spawned a class of models that have become the standard in formalizing these trading frictions. Many of the papers presented in this group add to this overall research effort, albeit along very different dimensions.

In the context of these models, frictions can help us to understand why the steady state unemployment rate is as high as it is in a country like the United States. But another key issue is to what extent these frictions help us to understand cyclical fluctuations in unemployment. Robert Shimer[37] argues that in the standard matching model the frictions can account for only a small fraction of cyclical fluctuations in the labor market. An important driving force behind this result is that the standard model assumes that wages are determined by Nash bargaining, which in turn implies that wages increase during good times and thus seriously dampen the incentives of firms to create new jobs. In a more recent paper, I[38] build on these insights by showing that a particular formulation of wage setting is consistent with both no unrealized bilateral gains to trade and wages that are relatively unresponsive to shocks to the value of a match. As a result, I provide an internally consistent model of labor market fluctuations that can replicate the main stylized facts.

I show too that matching models have a large set of equilibrium wages that are consistent with no unrealized bilateral gains to trade. In that setting, empirical understanding of wage determination is central. Mortensen[39] uses matched worker-firm data from Denmark to compare Nash bargaining to unilateral wage-setting by workers, with employment then determined by the firm. He finds that the Nash bargaining mechanism does a better job of matching the data.

One issue that has seen ongoing attention in this group is the effect of labor market institutions on labor market outcomes. The topics covered include: the implications of fixed-term labor contracts in the European context; the short-run effects of labor market flexibilization in Argentina; the role of taxes on labor market outcomes in Europe compared to the United States; the effects of firing costs and wage compression on unemployment durations; and the effect of labor market regulations on measured productivity.

Empirical work on labor market dynamics stresses the large magnitude of labor market flows. Many of these flows consist of workers making job-to-job transitions. Gadi Barlevy[40] demonstrates that the reallocation of workers to better matches associated with the job-to-job flows is reduced in recessions. This effect opposes the cleansing effect of recessions that has been widely cited. Ken Burdett, Ryoichi Imai, and Randall Wright[41] show that a model with on-the-job search (and hence job-to-job transitions) will lead quite naturally to multiple equilibriums that can be ranked in terms of the overall level of turnover.

Capital Markets and the Economy — *Janice C. Eberly and Deborah J. Lucas, Leaders*

This group brings together researchers working on capital markets from a variety of perspectives, including corporate finance, asset pricing, macro and monetary economics, international economics, and consumption/investment. Their common goal is a better understanding of the determinants and interactions of real and financial investments, and their effect on individual welfare and the macroeconomy. Recent work in this group centers on the effect of regulation on real investment; determinants of individual portfolio choice; the impact of financing constraints and irreversibility on firm-level investment; and the role of institutions, information, and beliefs in financial markets.

Alberto Alesina, Silvia Ardagna, Giuseppe Nicoletti, and Fabio Schiantarelli[42] find that various measures of regulation are negatively related to investment in physical capital. The authors use a new dataset on product market regulation of communications, utilities, and transportation in a set of OECD countries. Their results indicate that entry barriers have a particularly strong negative effect on new investment.

Simon Gilchrist and Marc Rysman[43] develop and study a new dataset on Chilean manufacturing plants to estimate a model of discrete investment useful for policy analysis. Joao Gomes, Amir Yaron, and Lu Zhang[44] specify and estimate a model

of investment with adjustment costs and costly external financing. Using both aggregate measures, such as the default premium, and firm-specific measures, such as leverage, they find no significant role for a financing premium in investment returns.

Andrea Caggese[45] studies the behavior in industry equilibrium of firms facing both a borrowing constraint and a non-negativity constraint on investment. His results suggest that the two constraints are mutually reinforcing, even though the financing constraint binds when the firm is growing, while the irreversibility constraint binds when the firm would prefer to shrink. The second constraint amplifies the effect of either alone, and leads to inventory behavior consistent with what is found empirically.

Stephen Bond's paper on physical investment[46] takes a more theoretical perspective on such investment and financing constraints, examining its sensitivity to cash flow. He analyzes the effect of cash flow on investment when a control for fundamentals is included in an investment regression. His results indicate that firms with a greater sensitivity of investment to cash flow will have a larger external financing premium. Thus, in this sense, cash flow sensitivity can be interpreted as a measure of the severity of financing constraints.

Turning to the role of financial institutions in credit markets, Joseph Peek and Eric S. Rosengren[47] use firm- and bank-level evidence from Japan to examine the allocation of credit in the Japanese banking system. Their results suggest that additional credit is channeled to firms in poor financial condition, and that these firms continue to perform poorly even after the extension of credit. Refet Gurkaynak[48] considers whether the capital structure of bank intermediaries can exacerbate economic shocks through a credit channel.

Two papers address aspects of portfolio choice. Francisco Gomes, Alexander Michaelides, and Valery Polkovnichenko[49] look at the optimal allocation of tax-deductible assets between tax sheltered and non-sheltered accounts, in a calibrated life-cycle model with labor income shocks. The model implies segregation of assets bearing high tax rates in tax deferred accounts. Many investors appear to contradict this advice, holding taxable investments such as dividend paying stocks and bonds outside of sheltered accounts. Entrepreneurs make financial investment decisions that interact with their ability to invest in entrepreneurial activity. Hugo Hopenhayn and Galina Vereshchagina[50] show that capital constraints can induce risk-preferring behavior by entrepreneurs, especially early in their careers. This might help to explain the apparently high risk-to-reward ratio many entrepreneurs seem to choose.

Understanding the relationship between financial market prices and fundamental value is the topic of the final two papers. I[51] derive the relationship between earnings and prices in a model with adjustment costs. Robert Chirinko and Huntley Schaller[52] find some evidence that financial market valuations overly influence the level of real investments, by looking at the success of future investments as a function of past financial returns.

Impulses and Propagation Mechanisms — *Martin S. Eichenbaum and Lawrence J. Christiano, Leaders*

This group considers two key issues: 1) what are the major sources of fluctuations in economic activity? and 2) what are the key mechanisms by which these shocks are propagated across sectors of the economy, over countries and over time? In exploring these questions, group members focus on three related activities: empirically identifying the effects of exogenous shocks on the economy; constructing empirical general equilibrium models of economic fluctuations; and exploring the efficacy of alternative policy responses to different shocks.

Jordi Gali, David Lopez-Salido, and Javier Valles;[53] Lawrence Christiano, Martin Eichenbaum, and Robert Vigfusson;[54] and David Altig, Christiano, Eichenbaum, and Jesper Linde[55] all work on isolating the effects of technology shocks on the U.S. economy. The key issues here are: how we can reliably identify aggregate technology shocks to the economy, including their effects on key macro variables like employment, and what role has monetary policy played in the transmission of these shocks? The previous papers argue that technology shocks generate expansions in employment. But the reason the U.S. economy responds to technology shocks the way it does has to do with monetary policy. The models developed in these papers suggest that if the Fed had not been accommodative in response to a positive technology shock, employment initially would have fallen rather than expanded in the wake of technology shocks.

Other members of this group focus on measuring the effects of fiscal shocks. For example, Craig Burnside, Eichenbaum, and Jonas Fisher[56] investigate the response of hours worked and real wages to changes in military purchases. A military shock causes a persistent increase in government purchases and a rise in tax rates, plus a persistent rise in aggregate hours worked and a decline in real wages. Susantu Basu and Miles Kimball[57] argue that models embodying nominal rigidities provide a more convincing account of this evidence. Using different identifying assumptions, Gali, Lopez-Salido, and Valles[58] show that shocks to government purchases do not lead to expansions in aggregate employment and output but to a rise in real wages. This leads them to explore non-neoclassical mechanisms to account for the effects of shocks to government purchases.

Christiano, Eichenbaum, and Charles Evans[59] construct and estimate a dynamic general equilibrium model embodying nominal wage rigidities as well as frictions to the real side of the economy. Michelle Alexopoulos[60] argues that efficiency wages and segmented financial markets play a key role in the monetary transmission mechanism. Consistent with this emphasis on labor market frictions, Gali, Mark Gertler, and Lopez-Salido[61] develop a theory-based measure of the variations in aggregate economic efficiency associated with business fluctuations. They decompose this indicator, which they refer to as "the gap," into

two constituent parts: a price markup and a wage markup. They show that the latter accounts for the bulk of the fluctuations in their gap measure.

Jess Benhabib, Stephanie Schmitt-Grohe, and Martin Uribe[62] explore the nature of optimal monetary policy once the zero bound on nominal interest rates is taken into account. They argue that Taylor-type interest-rate feedback rules give rise to unintended self-fulfilling decelerating inflation paths and aggregate fluctuations driven by arbitrary revisions in expectations. They then propose several fiscal and monetary policies that preserve the appealing features of Taylor rules, such as local uniqueness of equilibrium near the inflation target, and at the same time rule out the deflationary expectations that can lead an economy into a liquidity trap. Finally, Gauti Eggertsson and Michael Woodford[63] study optimal monetary policy in a New Keynesian model when real disturbances cause the natural interest rate to be temporarily negative.

---

[1] *L. Hendricks, "How Important is Human Capital for Development? Evidence from Immigrant Earnings,"* American Economic Review*, 92 (March 2002), pp. 198-219.*

[2] *S. Djankov, R. La Porta, F. Lopez de Silanes, and A. Shleifer, "The Regulation of Entry," NBER Working Paper No. 7892, September 2000, and* Quarterly Journal of Economics*, 117 (February 2002), pp. 1-37.*

[3] *D. Acemoglu, S. Johnson, and J. Robinson, "The Rise of Europe: Atlantic Trade, Institutional Change and Economic Growth," NBER Working Paper No. 9378, December 2002.*

[4] *J. Galdon-Sanchez and J. Schmitz, "Competitive Pressure and Labor Productivity: World Iron-Ore Markets in the 1980s,"* American Economic Review*, 92 (September 2002), pp. 1222-35.*

[5] *T. Klette and S. Kortum, "Innovating Firms and Aggregate Innovation," NBER Working Paper No. 8819, February 2002.*

[6] *R. Manuelli and A. Seshadri, "Frictionless Technology Diffusion: The Case of Tractors," NBER Working Paper No. 9604, April 2003.*

[7] *N. Souleles, S. Agarwal, C. Liu, D. Johnson, and J. Parker, "The Response of Consumer Spending and Debt to Tax Rebates: Evidence from the CEX and the Household Credit Accounts," manuscript, 2003.*

[8] *J. Heathcote, K. Storesletten, and G. Violante, "The Macroeconomic Implications of Rising Wage Inequality in the U.S.," manuscript, 2003.*

[9] *V. Quadrini, "Uninsurable Investment Risks," manuscript, 2003.*

[10] *V. Quadrini and M. Mrkaic, "Entrepreneurial Investment and Savings," manuscript, 2001.*

[11] *E. French and J. Jones, "On the Distribution and Dynamics of Health Care Costs," manuscript, 2003.*

[12] *A. Michaelides, "Buffer Stock Saving and Habit Formation," manuscript, 2003.*

[13] *B. Peterson, "Aggregate Uncertainty, Individual Uncertainty, and the Housing Market," manuscript, 2003.*

[14] *B. Duygan, "Analyzing Durable Goods Purchases and Idiosyncratic Income Uncertainty," manuscript, 2003.*

[15] *A. Diaz and M. Luengo-Prado, "Precautionary Savings and Wealth Distribution with Durable Goods," manuscript, 2003.*

[16] *D. Krueger and J. Fernandez-Villaverde, "Consumption over the Life Cycle: Facts from Consumer Expenditure Survey Data," NBER Working Paper No. 9382, December 2002.*

[17] *D. Mookherjee and D. Ray, "Persistent Inequality,"* Review of Economic Studies*, 70 (April 2003), pp. 369-93.*

[18] *A. Banerjee and E. Duflo "Inequality and Growth: What can the Data Say?"* Journal of Economic Growth*, 8 (September 2003).*

[19] *F. Caselli and N. Gennaioli, "Dynastic Management," NBER Working Paper No. 9442, January 2003.*

[20] *M. Thoenig and T. Verdier, "A Theory of Defensive Skill-Biased Innovation and Globalization,"* American Economic Review*, 93 (June 2003), pp. 709-28.*

[21] *M. Kremer and E. Maskin, "Globalization and Inequality," Harvard University manuscript, 2003.*

[22] *O. Galor and A. Mountford, "Trade, Demographic Transition, and the Great Divergence," Brown University manuscript, 2003.*

[23] *R. Fernandez, N. Guner, and J. Knowles, "Inequality, Education, and Marital Sorting," NBER Working Paper No. 8580, November 2001.*

[24] *W. Brock and S. Durlauf, "Multinomial Choice with Social Interactions," NBER Technical Working Paper No. 288, March 2003.*

[25] *W. Easterly, "The Racial Tipping Point in American Neighborhoods: Unstable Equilibrium or Urban Legend," New York University manuscript, 2003.*

[26] *J.B. Liebman, J. R. Kling, and L.F. Katz, "What Randomized Experiments Can Teach Us About Social Interactions," Harvard University manuscript, 2003.*

[27] *O. J. Blanchard and F. Giavazzi, "Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets"* Quarterly Journal of Economics*, 118 (August 2003).*

[28] *O. J. Blanchard and T. Philippon, "The Decline of Rents", MIT manuscript, 2002.*

[29] *G. Saint-Paul, "The Political Economy of Employment Protection,"* Journal of Political Economy*, 110 (June 2002), pp. 672-701.*

[30] *J. Hassler, J. Rodriguez Mora, K. Storesletten, and F. Zilibotti, "The Survival of the Welfare State,"* American Economic Review*, 93 (March 2003), pp. 87-112.*

[31] *A. Alesina and E. LaFerrara, "Preferences for Redistribution in the Land of Opportunities," NBER Working Paper No. 8267, May 2001.*

[32] *D. Acemoglu, S. Johnson, and J. Robinson, "Reversal of Fortune: Long-Run Changes in the Distribution of Prosperity,"* Quarterly Journal of Economics*, 117 (November 2002), pp. 1231-94.*

[33] *O. Galor, O. Moav, and D. Vollrath, "Land Inequality and the Origin of Divergence and Overtaking in the Growth Process: Theory and Evidence," Brown University manuscript, 2002.*

[34] *B. Bernanke, J. Boivin, and P. Eliasz, "Measuring the Effects of Monetary Policy: A Factor-Augmented Vector Auto-Regressive (FAVAR) Approach," manuscript, 2003.*

[35] *D. Giannone, L. Reichlin, and L. Sala, "Tracking Greenspan: Systematic and Unsystematic Monetary Policy Revisited," CEPR Discussion Paper 3550, 2002.*

[36] *J. Bai, "Inferential Theory for Factor Models of Large Dimensions," manuscript, 2002.*

[37] *R. Shimer, "The Cyclical Behavior of Equilibrium Unemployment and Vacancies: Evidence and Theory," NBER Working Paper No. 9536, March 2003.*

[38] *R.E. Hall, "Wage Determination and Employment Fluctuations," manuscript, 2003.*

[39] D. Mortensen, "How Are (Danish) Wages Determined?" manuscript, 2003.
[40] G. Barlevy, "The Sullying Effects of Recessions," Review of Economic Studies, (January 2002), pp. 65-96.
[41] K. Burdett, R. Imai, and R. Wright, "Unstable Relationships," PIER Working Paper No. 02-037, 2002.
[42] A. Alesina, S. Ardagna, G. Nicoletti, and F. Schiantarelli, "Regulation and Investment," NBER Working Paper No. 9560, March 2003.
[43] S. Gilchrist and M. Rysman, "Trade Liberalization and Lumpy Investment: Evidence from Chilean Plant-level Data," manuscript, 2003.
[44] J. Gomes, A. Yaron, and L. Zhang, "Investment and Returns with Financing Constraints: Evidence Using Firm Data," manuscript, 2003.
[45] A. Caggese, "Financing Constraints, Irreversibility, and Investment Dynamics," manuscript, 2003.
[46] S. Bond, "Conditional Cash Flow Sensitivities and Financing Constraints," manuscript, 2003.
[47] J. Peek and E.S. Rosengren, "Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan," NBER Working Paper No. 9643, April 2003.
[48] R. Gurkaynak, "Financial Intermediaries as Firms and the Business Cycle," manuscript, 2003.
[49] F. Gomes, A. Michaelides, and V. Polkovnichenko, "Life Cycle Portfolio Choice with Taxable and Tax Deferred Accounts," manuscript, 2003.
[50] H. Hopenhayn and G. Vereshchagina, "Risk Taking by Entrepreneurs," manuscript, 2003.
[51] R.E. Hall, "The Dynamics of Corporate Earnings," manuscript, 2003.
[52] R. Chirinko and H. Schaller, "Glamour vs. Value: The Real Story," manuscript, 2003.
[53] J. Gali, J. Lopez-Salido, and J. Valles, "Technology Shocks and Monetary Policy: Assessing the Fed's Performance," NBER Working Paper No. 8768, February 2002.
[54] L.J. Christiano, M.S. Eichenbaum, and R. Vigfusson, "What Happens after a Technology Shock," NBER Working Paper No. 9819, July 2003.
[55] D. Altig, L.J. Christiano, M.S. Eichenbaum, and J. Linde, "Technology Shocks and Aggregate Fluctuations," manuscript, 2003.
[56] C. Burnside, M.S. Eichenbaum, and J. Fisher, "Fiscal Shocks and Their Consequences," NBER Working Paper No. 9772, June 2003.
[57] S. Basu and M. Kimball, "Investment Planning Costs and the Effects of Fiscal and Monetary Policy," manuscript, 2003.
[58] J. Gali, D. Lopez-Salido, and J. Valles, "Technology Shocks and Monetary Policy: Assessing the Fed's Performance," NBER Working Paper No. 8768, February 2002.
[59] L.J. Christiano, M.S. Eichenbaum, and C. Evans, "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy," NBER Working Paper No. 8403, July 2001.
[60] M. Alexopoulos, "Efficiency Wages and Inter-Industry Wage Differentials," manuscript, 2002.
[61] J. Gali, M. Gertler, and D. Lopez-Salido, "Markups, Gaps, and the Welfare Costs of Business Fluctuations," NBER Working Paper No. 8850, March 2002.
[62] J. Benhabib, S. Schmitt-Grohe, and M. Uribe, "Backward-Looking Interest-Rate Rules, Interest-Rate Smoothing, and Macroeconomic Instability," NBER Working Paper No. 9558, March 2003.
[63] G. Eggertsson and M. Woodford, "The Zero Bound on Interest Rates and Optimal Monetary Policy," manuscript, 2002.

*

Research Summaries

Capital Account Opening, International Reserves, and Development: Evidence and Some Policy Controversies

Joshua Aizenman*

One salient feature of the global economy over the last 20 years has been the embrace by developing countries of financial reforms, leading to growing opening of capital accounts. The adjustment process to financial integration has been rocky: growing financial opening frequently has been associated with financial crises. Literature on the subject has led to a spirited debate concerning the wisdom of unrestricted capital mobility between the OECD and emerging markets.[1] Notwithstanding this debate, the strongest argument for financial opening may be a pragmatic one. Like it or not, greater trade integration erodes the effectiveness of restrictions on capital mobility. Hence, for successful emerging markets that engage in trade integration, financial opening is not a question of if, but rather of when and how. Consequently, the pragmatic approach to the problem should recognize that there is no quick fix to exposure to financial crises induced by financial opening. Instead, the challenge is to reduce the depth and frequency of the crises. This report reviews some of my recent research on these issues.

* *Aizenman is a Research Associate in the NBER's Program on International Trade and Investment and a Professor of Economics at the University of California, Santa Cruz. His profile appears later in this issue.*

Limited Access to International Financial Markets and the Precautionary Demand for International Reserves by Developing Countries

One frequent by-product of financial opening has been financial crises. A possible mechanism that explains these crises is the inflow of short-term capital in the aftermath of financial opening (inflows dubbed as "hot money"). These short-term flows are "footloose," subject to abrupt reversal, exposing the developing country to greater hazard of a liquidity squeeze, occasionally leading to full-blown financial crises. Nancy Marion and I show that hoarding foreign exchange reserves may serve a useful role in dealing with exposure to such crises.[2] These findings are consistent with the observation that since the 1997-8 Asian financial crises, monetary authorities in emerging markets in East Asia have more than doubled their stockpiles of foreign exchange reserves.

Marion and I start by conducting statistical analyses to explain the holdings of international reserves by developing countries, using the conventional variables employed in the literature. We extend these analyses by adding two political measures that may lower the demand for reserves. We confirm that an increase in an index of political corruption significantly reduces reserve holdings, as does an increase in the probability of a change in government leadership. Our research leads us to conclude that the recent large buildup of international reserve holdings in East Asia is motivated by the experience of the recent Asian financial crisis.[3] Therefore, we examine the possibility that the buildup may represent "precautionary" holdings, and find two situations that can give rise to increased demand for such holdings.[4]

The first is the government's desire to "smooth consumption"—that is, to spread over time the costs of shocks. When countries' access to capital markets is diminished, and when it is costly to either raise taxes or cut government spending, then countries will find it desirable to hold large precautionary reserve balances. The model also helps us to understand why some developing countries have chosen not to hold large precautionary reserve balances. Specifically, countries that strongly favor current consumption, that experience political instability, or that suffer from political corruption face a lower effective return on holding reserves and will accumulate more modest stockpiles.

The second situation leading to a buildup of reserves is "loss aversion" after the 1997-8 Asian financial crises. Loss aversion is the tendency to be more sensitive to reductions than to increases in consumption.[5] We show that the government will choose to hold a relatively large stock of reserves if it believes that the populace is loss-averse. We also show that, even when

the return on domestic capital far exceeds the return on the safe asset, it still can be desirable for the government to hold large reserve balances if agents are loss-averse.

While our study is consistent with the view that hoarding foreign exchange reserves may serve a useful role, all countries may not benefit from adopting this strategy. In particular, our results suggest that the benefits accrue only when countries optimally control both the saving of precautionary reserves and external borrowing.[6] Attempts to focus solely on the reserves side may disappoint if the borrowing side is abused as a result of political uncertainty or corruption.[7]

On the Hidden Links between Trade and Financial Openness

The pragmatic case for financial reforms in the presence of growing trade integration follows from the observation that trade openness also determines the magnitude of potential financial leakage. A frequent mechanism facilitating capital flight is over-invoicing of imports and under-invoicing of exports. The scale of these activities is proportional to the commercial openness of the economy. Curtailing illicit capital flows is costly: it requires spending resources on monitoring and enforcement of the existing capital controls. I show that costly collection of taxes and high enough outstanding public debt implies that financial repression in the form of capital controls would be part of the menu of taxes.[8] Higher outstanding public debt and more costly collection of taxes increase the level of financial repression adopted by the policymaker. One key message from this framework is that greater commercial openness reduces the level of financial repression chosen by developing countries. This follows from the observation that greater commercial openness increases the effective cost of enforcement of financial repression, thereby reducing the usefulness of financial repression as an implicit tax. These results are consistent with the finding that, using five-year intervals and controlling for GDP/capita changes and allowing for country-specific effects, an increase in (exports+imports)/GDP of a developing country is associated with a highly significant increase in financial openness (as measured by gross private capital inflows plus gross private outflows divided by GDP). In a follow-up paper, Noy and I use annual data and find that financial openness in developing countries depends positively on lagged trade openness and the GDP/capita, and negatively on measures of democracy.[9] This discussion also implies that greater trade integration increases the impetus for financial reform. Yet, it also suggests that financial reforms are sustainable only if they do not ignore the fiscal consequences associated with the drop in fiscal revenue, and with the consequent increased cost of recycling the public debt. Hence, the sustainability of financial reform requires finding alternative means of taxation (or reducing government expenditure), and preferably reducing the size of outstanding public debt.

Dealing with Volatile Capital Flows

The discussion above implies that greater financial openness of emerging markets is the inevitable outcome of the growing trade integration of countries. Hence, most emerging countries would be exposed to similar challenges as part of the growing integration with global markets. The prevalence of financial crises in the 1990s has led to a re-examination of how financial markets function, leading to calls by some economists for deep structural changes in the international financial architecture.[10]

A less aggressive approach to providing greater stability is the imposition of reserve requirements on lenders and/or borrowers, as well as the possibility of capital adequacy requirements linked to a bank's portfolio risk. The Basle committee, as well as Fed Chairman Alan Greenspan,[11] advocates this approach. The rationale for reserve requirements is provided by the presence of various externalities. On the lender's side, the anticipation of bailouts introduces an externality, by which marginal lending adversely affects the taxpayer. On the borrower's side, as long as partial defaults are costly, marginal borrowing affects all agents by increasing the probability of a costly default.[12] The introduction of reserve requirements, either by borrowers or lenders, may impose better discipline on the global financial market. Borrowing will decline, but so will default risk, reducing the necessity for continued bailouts. The introduction of reserve requirements will improve welfare in both the lending and the borrowing economies. In these circumstances, the lender's optimal reserve requirement increases with the expected bailout. Indirectly, this policy may reduce the bias in favor of debt and against equity in international lending, as identified by Rogoff.[13] But the design of the optimal reserve requirement in a decentralized world is a delicate matter. Indeed, without proper coordination among all lenders, reserve requirements would reallocate lending from high- to low-reserve countries, resulting in few beneficial effects. Hence, the gains from such policies will be determined by the ability of international institutions (the BIS, IMF, and others) to induce all lenders to apply similar policies, driven by the underlying risk factors.[14]

Foreign Direct Investment Flows to Developing Countries and Macroeconomic Volatility

One of the more persistent and enduring forms of capital flows has been foreign direct investment (FDI). This type of investment frequently is part of a more comprehensive reallocation of production, and also may include significant transfers of technology.[15] Marion and I present evidence showing that, controlling for a range of variables employed in the literature to account for FDI, measures of instability (such as macroeconomic volatility, political instability, and sovereign risk) have a large adverse effect on FDI inflows to developing countries.[16] This effect is more profound

for vertical than for horizontal FDI.[17] It suggests that a major obstacle preventing greater FDI inflows to developing countries is exposure to high inflow volatility, and not necessarily the absence of potential gains that would materialize in more stable circumstances. We provide a model that explains these findings, attributing it to the limited substitutability between various production stages in a vertical organization of production.

In a follow up work,[18] I explore the implications of the deepening presence of multinationals in emerging markets for the cost of macroeconomic volatility there. I show that macroeconomic volatility has a potentially large impact on employment and investment decisions of multinationals producing intermediate inputs in developing countries. For industries with costly capacity, the multinationals tend to invest in the more stable emerging market/s. Higher shock volatility in a given emerging market producing intermediate inputs reduces the multinationals' expected profits. High enough instability in such a market would induce the multinationals to diversify intermediate inputs production, investing in several emerging markets. This effect is stronger in lower margin industries. Such diversification increases the responsiveness of the multinationals' labor requirements in each country to productivity shocks, channeling the average employment from the more to the less volatile location, and reducing the overall multinationals' expected employment in emerging markets.

Concluding Remarks

Managing volatility will remain a key challenge for emerging countries, a by-product of growing integration of these countries with the global economy. This process offers both opportunities and challenges. This discussion has identified some of these issues, and illustrated the presence of mechanisms that may help developing countries in dealing constructively with these challenges.

---

[1] *A useful survey of financial liberalization is J. G. Williamson and M. Mahar, A Survey of Financial Liberalization, Princeton Essays in International Finance, 211 (November 1998). See also D. Rodrik, "Who Needs Capital-Account Convertibility?" in P. Kenen, ed.,* Should the IMF Pursue Capital Account Convertibility? Essays in International Finance*, No. 207, Princeton: Princeton University Press, May 1998, and T. Hellmann, K. Murdock, and J. E. Stiglitz, "Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?"* American Economic Review*, 90 (1), (2000), pp. 147-65, for skeptical assessments of the gains from financial liberalization. For studies dealing with the financial instability associated with capital account opening see the papers in S. Edwards and J. A. Frankel, eds.,* Preventing Currency Crises in Emerging Markets*, Chicago: University of Chicago Press, 2002, and M. Feldstein, ed.,* Economic and Financial Crises in Emerging Market Economies*, Chicago, University of Chicago Press, 2003. See J. Aizenman, "Financial Opening: Evidence and Policy Options," forthcoming in* Challenges to Globalization*, R. Baldwin and A. Winters, eds., Chicago: University of Chicago Press, for overview of the challenges associated with financial opening.*

[2] *J. Aizenman and N.P. Marion, "International Reserve Holdings with Sovereign Risk and Costly Tax Collection," NBER Working Paper No. 9154, September 2002, forthcoming in* Economic Journal*, and "The High Demand for International Reserves in the Far East: What's Going On?" NBER Working Paper No. 9266, October 2002,* Journal of the Japanese and International Economies*,17(3)(September 2003).*

[3] *J. Aizenman and N.P. Marion, "The High Demand for International Reserves in the Far East: What's Going On?"*

[4] *J. Aizenman and N.P. Marion, "International Reserve Holdings with Sovereign Risk and Costly Tax Collection."*

[5] *Loss aversion was identified as one of the behavioral regularities that is inconsistent with expected utility maximization. See A. Tversky and D. Kahneman, "Loss Aversion and Riskless Choice: A Reference Dependence Model,"* Quarterly Journal of Economics*, 106 (1991), pp. 1039-61. I also illustrated that loss aversion substantially increases the size and welfare gain associated with the optimal level of buffer stock and precautionary savings. See J. Aizenman, "Buffer Stocks and Precautionary Savings with Loss Aversion,"* Journal of International Money and Finance*, 17 (1998), pp. 931-47.*

[6] *Mismanagement of international reserves also may deepen the financial crisis, as was the case with Korea in 1996-7. See J. Aizenman and N.P. Marion, "Reserve Uncertainty and the Supply of International Credit"* Journal of Money, Credit and Banking*, 34 (3) (August 2002), pp. 631-49.*

[7] *A high short-term debt/international reserves ratio was found to be an indicator of vulnerability, signifying exposure to crises. See D. Rodrik and A. Velasco, "Short-Term Capital Flows," NBER Working Paper No. 7364, March 2000. Our paper illustrates that this does not imply that all emerging markets would benefit by increasing the cushion of international reserves. This may be viewed as another example of the Lucas Critique, cautioning us about the hazard of using past data to formulate future policies.*

[8] *J. Aizenman, "On the Hidden Links Between Financial and Trade Opening," manuscript, University of California, Santa Cruz, 2003.*

[9] *J. Aizenman and I. Noy, "Endogenous Financial Openness: Efficiency and Political Economy Considerations," manuscript, University of California, Santa Cruz, 2003.*

[10] *Several recent monographs provide a comprehensive overview of the various proposals. See B. Eichengreen,* A New International Financial Architecture: A Practical Post-Asia Agenda*, Washington, D.C.: Institute for International Economics, 1999; K. Rogoff, "International Institutions for Reducing Global Financial Instability,"* Journal of Economic Perspectives*, 13 (4) (Fall 1999), pp. 21- 42; J.A. Frankel and N. Roubini, "The Role of Industrial Country Policies in Emerging Market Crises," NBER Working Paper No. 8634, December 2001; and M. Feldstein, "Economic and Financial Crises in Emerging Market Economies: Overview of Prevention and Management," NBER Working Paper No. 8837, March 2002.*

[11] *A. Greenspan, Speech at the 34th Annual Conference on Bank Structure and Competition of the Federal Reserve Bank of Chicago, May 24, 1998.*

[12] *J. Aizenman and S. Turnovsky, "Reserve Requirements on Sovereign Debt in the Presence of Moral Hazard — on Debtors or Creditors?"* The Economic Journal*, (2002), pp. 107-132.*

[13] *K.S. Rogoff, "International Institutions for Reducing Global Financial Instability."*
[14] *Alternatively, emerging markets may enact similar policies aimed at curbing short-term financial flows, akin to the Chilean system in the nineties. See B. Eichengreen,* A New International Financial Architecture: A Practical Post-Asia Agenda*; and S. Edwards, "Exchange Rate Regimes, Capital Flows, and Crisis Prevention."*
[15] *See J. R. Markusen,* Multinational Firms and the Theory of International Trade, *Cambridge, MA: MIT Press, 2002, and R.C. Feenstra,* Advanced International Trade: Theory and Evidence*, forthcoming from Princeton University Press, 2003, Chapter 11.*
[16] *J. Aizenman and N.P. Marion, "The Merits of Horizontal versus Vertical FDI in the Presence of Uncertainty," manuscript, University of California, Santa Cruz, 2003, forthcoming* Journal of International Economics.
[17] *A vertical pattern arises when the multinational firm fragments the production process internationally, locating each stage of production in the country where it can be done at the lowest cost. A horizontal pattern occurs when the multinational produces the same product or service in multiple countries.*
[18] *J. Aizenman, "Volatility, Employment, and the Patterns of FDI in Emerging Markets," forthcoming,* Journal of Development Economics*, 2003.*

The Two Life Cycles of Human Creativity

David W. Galenson*

At what stage of their lives are great innovators most creative?

There are two very different answers to this question. Some great innovators make their most important discoveries suddenly, very early in their careers. In contrast, others arrive at their major contributions gradually, late in their lives, after decades of work. Which of these two life cycles a particular innovator follows is related systematically to his conception of his discipline, how he works, and to the nature of his contribution.

My research on this issue began when I first set out to develop quantitative measures of the quality of the work of important individual modern painters over the course of their lives.[1] Since then, these measurements have led not only to a new and more systematic understanding of the sources of innovation in modern art, but also to a more general and comprehensive framework for analyzing the creativity of individuals in a wide range of intellectual activities. After explaining the application of this analysis to the careers of modern painters, this report will demonstrate how its implications have illuminated the history of modern art, and then will show briefly how the analysis can be extended to innovators in other disciplines.

* *Galenson is a Research Associate in the NBER's Program on Labor Studies and a Professor of Economics at the University of Chicago. His profile appears later in this issue.*

Seekers and Finders

Like important scholars, important artists are innovators.[2] Great modern artists can be divided into two groups, defined according to differences in their goals, methods, and contributions.

Painters who have produced *experimental* innovations have been motivated by aesthetic criteria: they have aimed at presenting visual perceptions. Their goals are imprecise, so their procedure is tentative and incremental. The imprecision of their goals means that they rarely feel they have succeeded, so their careers are often dominated by the pursuit of a single objective. These artists paint the same subject many times, gradually changing its treatment by trial and error. They consider the production of a painting as a process of searching, in which they aim to discover the image in the course of making it. They build their skills slowly over the course of their careers, and their innovations emerge piecemeal in a body of work.

In contrast, painters who have made *conceptual* innovations have intended to communicate specific ideas or emotions. Their goals for a particular work can be stated precisely in advance. They often make detailed preparatory plans for their paintings, and execute their final works systematically. Conceptual innovations appear suddenly, as a new idea produces a result quite different not only from other artists' work, but also from the artist's own previous work. Conceptual innovations are consequently often embodied in individual breakthrough paintings. The conceptual artist's certainty about his goals, and confidence that he has achieved them, often leaves him free to pursue new and different goals. Unlike the continuity of the work of the experimental artist, conceptual artists' careers are therefore often characterized by discontinuity.

The long periods of trial and error usually required for important experimental innovations mean that they tend to occur late in an artist's career. Conceptual innovations are made more quickly, and can occur at any age. Yet radical conceptual innovations depend on the ability to perceive and appreciate extreme deviations from existing practices, and this ability tends to decline with experience, as habits of thought become more firmly established. The most important conceptual innovations therefore generally occur early in an artist's career.

Archetypes

Two of the greatest modern artists epitomize the two types of innovator.

Paul Cézanne was an experimental innovator. A month before his death in 1906, the 67-year-old Cézanne wrote to a friend:

"Now it seems to me that I see better and that I think more correctly about the direction of my studies. Will I ever attain the end for which I have striven so much and so long? I hope so, but as long as it is not attained a vague state of uneasiness persists which will not disappear until I have reached port, that is until I have realized something which develops better than in the past... So I continue to study... I am always studying after nature, and it seems to me that I make slow progress."[3]

This brief passage expresses nearly all the characteristics of the experimental artist — the visual criteria, the view of his enterprise as research, the incremental nature and slow pace of his progress, the absorption in the pursuit of a vague and elusive goal, and the frustration with his perceived lack of success in achieving that goal of "realization." The critic Roger Fry explained that Cézanne's frustration was a consequence of his uncertain attitude and incremental approach:

For him as I understand his work, the ultimate synthesis of a design was never revealed in a flash; rather he approached it with infinite precautions... For him the synthesis was an asymptote toward which he was forever approaching without ever quite reaching it.[4]

The irony of Cézanne's fear of failure at the end of his life stems from the fact that it was his most recent work, the paintings of his last few years, that would soon come to be considered his greatest contribution, and would directly influence every important artistic development of the decades that followed.

Unlike Cézanne, who told a friend "I seek in painting," the leading artist of the next generation, Pablo Picasso, confidently declared "I don't seek; I find."[5] In 1923 Picasso stated that:

"The several manners I have used in my art must not be considered as an evolution or as steps toward an unknown ideal... I have never made trials or experiments. Whenever I have had something to say, I have said it in the manner in which I have felt it ought to be said."[6]

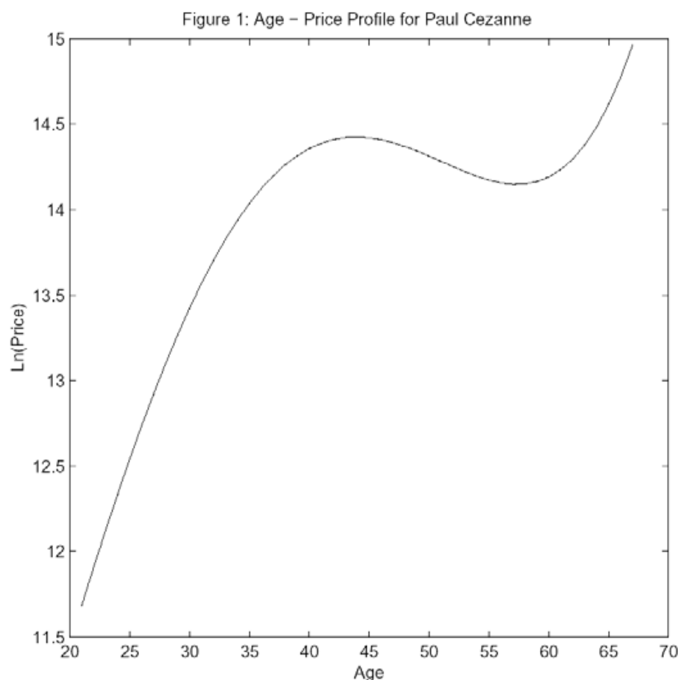
Generations of art historians have commented on the abruptness and frequency of Picasso's stylistic changes. One biographer made this point by comparing Picasso with Cézanne: "There was not one Picasso, but ten, twenty, always different, unpredictably changing, and in this he was the opposite of a Cézanne, whose work ... followed that logical, reasonable course to fruition."[7] For Picasso, new ideas brought new styles, for his conceptual art was intended not to represent the appearance of his subjects, but rather his knowledge of them: "I paint objects as I think them, not as I see them."[8]

Picasso often planned his paintings carefully in advance. In 1907, at age 26, he painted *Les Demoiselles d'Avignon* after making more than 400 studies, "a quantity of preparatory work ... without parallel, for a single painting, in the entire history of art."[9] The large canvas became his most famous work, for it served to announce the beginning of the conceptual Cubist movement, "the most complete and radical artistic revolution since the Renaissance."[10]

Quantifying Artistic Success

Regression analysis of all auction sales of paintings by Cézanne and Picasso during 1970- 97 yields the age-price profiles of Figures 1 and 2.[11] Cézanne's work rises in value to the end of his life, when he arrived at his most radical solutions to the problem of portraying nature without sacrificing depth and solidity. Picasso's most valuable work dates from 1907, the year he painted the *Demoiselles d'Avignon*.

Figures 1 and 2 obviously reflect the preferences of collectors. To compare these to the judgments of art scholars, I surveyed the paintings used as illustrations in textbooks. An analysis of 33 books published in English revealed that for both artists the single year represented by the largest number of illustrations is the same as that estimated to represent the artist's peak in



value — age 67 for Cézanne, and 26 for Picasso.[12] Separate analysis of 31 books published in French yielded precisely the same results.[13]

I now have used these measures to study the careers of more than 125 important modern painters. The auction market and the textbooks almost always agree closely on when the painter produced his best work.[14]

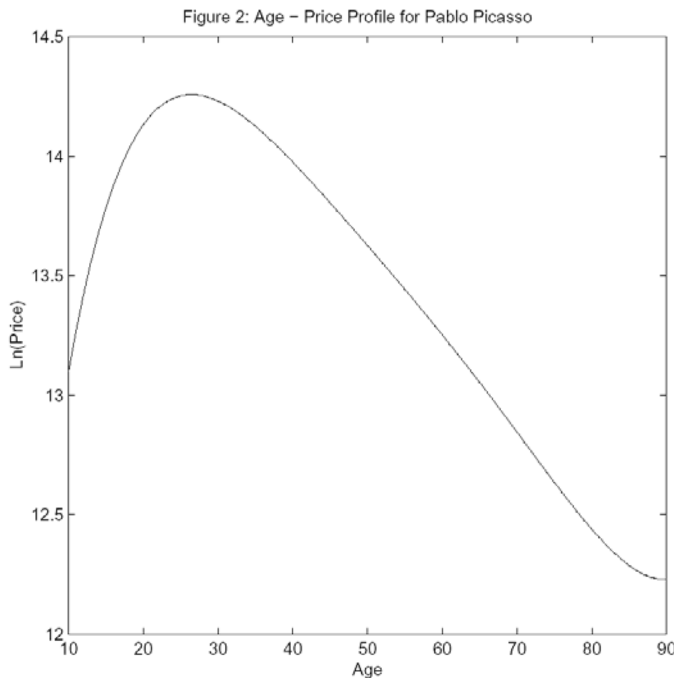


Figure 2: Age – Price Profile for Pablo Picasso

Analysis of these painters' working methods, and of the nature of their innovations, furthermore, reveals that their life cycles almost always follow the predicted pattern: painters who worked experimentally have nearly always produced their best work late in their careers, whereas those whose innovations were conceptual have nearly always made their greatest contributions early. Thus such major experimental painters as Camille Pissarro, Edgar Degas, Wasily Kandinsky, Georgia O'Keeffe, Jean Dubuffet, Mark Rothko, and Willem de Kooning all reached their peak achievements after the age of 40. In contrast, such important conceptual innovators as Georges Seurat, Henri de Toulouse-Lautrec, Georges Braque, Juan Gris, Giorgio de Chirico, Jasper Johns, and Frank Stella all made their greatest contributions before the age of 30.[15]

Masters and Masterpieces

Recognition of the differences in methods and products between experimental and conceptual painters helps to resolve a number of puzzles in the history of modern art. One of these involves a discrepancy between the greatest painters and the greatest paintings. Specifically, if we rank both painters and paintings according to total illustrations in textbooks, we find that some of the most important artists failed to produce important individual works, while some of the most important paintings were produced by painters who do not rank among the very most important artists.[16]

The analysis provided here points to the explanation. Great experimental painters, like Cézanne, Degas, and Monet, innovated gradually, making many small changes in their technique over the course of extended periods and many canvases, and their greatest contributions were not embodied in individual breakthrough works. Consequently, there is no consensus on which of their paintings best illustrates their achievements. In contrast, conceptual innovations normally are declared in specific breakthrough works. Thus at the age of 27 Seurat specifically designed *Sunday Afternoon on the Island of the Grande Jatte* to illustrate his scientific approach to the use of color, and it became the most famous painting executed in the nineteenth century. Two decades later the 25-year-old Marcel Duchamp painted *Nude Descending a Staircase* to demonstrate his conception of the static representation of movement, and it became the third most famous painting produced in the twentieth century, behind only the *Demoiselles d'Avignon* and another landmark work, *Guernica*, by the conceptual Picasso. So the puzzle is resolved: important conceptual painters produce famous individual masterpieces, but great experimental painters do not, instead producing important bodies of work.

Beyond Modern Art

The implications of this research go beyond modern art. It is now clear that this analysis can be applied equally to great painters of the pre-modern era: Masaccio, Raphael, and Holbein were conceptual artists, whereas Leonardo, Titian, Michelangelo, and Rembrandt were experimental.[17] But the applicability of the analysis goes beyond art in general, for I believe that in virtually all intellectual activities there are important practitioners of both types described here, and that in all these activities there are consequently two distinct life cycles of creativity.

Results from studies of innovators in three other disciplines provide support for this belief. One of these studies analyzes the life cycles of Nobel laureates in economics. Whereas such theorists as Kenneth Arrow, Gary Becker, Paul Samuelson, and Robert Solow all published their most often cited work before the age of 35, the empiricists Simon Kuznets and Theodore Schultz both published their most-cited work after the age of 50. Economic theorists work deduc-

tively, and innovate conceptually, while in contrast the empiricists Kuznets and Schultz worked inductively, and innovated experimentally.[18]

A second related study examines the careers of important modern American poets. The production of great poetry often is considered to be the exclusive domain of the young.[19] But quantitative analysis of individual careers contradicts this belief. By the measure of poems reprinted in anthologies, the careers of E. E. Cummings, T. S. Eliot, Ezra Pound, and Richard Wilbur were dominated by the work of their 20s and 30s, but in contrast Elizabeth Bishop, Robert Frost, Robert Lowell, Marianne Moore, Wallace Stevens, and William Carlos Williams all produced their major work in their 40s and beyond. The elegant and sophisticated poetry of Cummings, Eliot, Pound, and Wilbur grew primarily out of imagination and study of literary history, and was formulated conceptually, while Bishop, Frost, Lowell, Moore, Stevens, and Williams produced poetry rooted in real speech and experience, drawing on the observed reality of their daily lives to innovate experimentally.[20]

A third related study shows that the careers of great modern novelists have followed these same two patterns. Herman Melville, D.H. Lawrence, F. Scott Fitzgerald, and Ernest Hemingway wrote with confidence and clarity of purpose to express their ideas and emotions, and produced conceptual masterpieces early in their careers. In contrast, Charles Dickens, Mark Twain, Henry James, Virginia Woolf, and William Faulkner worked tentatively toward better representations of the world they knew, and arrived at their greatest contributions only after decades of experimentation.[21]

The full implications of this research appear to be considerable, and remain to be pursued through study of innovators in other disciplines. The implications involve not only substance but also method, for the results I have obtained suggest that, contrary to the tendency of economists to study the life cycle only for groups of workers, it may be of considerable value to study the careers of important individual innovators. This work may eventually give us a more systematic understanding of human creativity wherever it occurs — in artists' studios, scholars' studies, or computer scientists' cyberspace.

---

[1] *D. W. Galenson, "The Careers of Modern Artists: Evidence from Auctions of Contemporary Paintings," NBER Working Paper No. 6331, December 1997, and in* Journal of Cultural Economics*, 24 (2000), pp. 87-112.*

[2] *For discussion see D. W. Galenson,* Painting outside the Lines: Patterns of Creativity in Modern Art*, Chapter 4, Cambridge: Harvard University Press, 2001.*

[3] *P. Cézanne,* Letters*, New York: Da Capo Press, 1995, pp. 329-30.*

4 *R. Fry,* Cézanne*, Chicago: University of Chicago Press, 1989, p. 3.*

[5] *R. Shiff,* Cézanne and the End of Impressionism*, Chicago: University of Chicago Press, 1984, p. 222; F. Gilot and C. Lake,* Life with Picasso*, New York: Doubleday, 1964, p. 199.*

[6] *A. H. Barr, Jr.,* Picasso*, New York: Museum of Modern Art, 1946, p. 271.*

[7] *P. Cabanne,* Pablo Picasso*, New York: William Morrow, 1977, p. 272.*

[8] *J. Golding,* Cubism*, London: Faber and Faber, 1959, p. 60.*

[9] *W. Rubin, H. Seckel, and J. Cousins,* Les Demoiselles d'Avignon*, New York: Museum of Modern Art, 1994, pp. 14, 119.*

[10] *See J. Golding,* Cubism*, p. 15.*

[11] *D. W. Galenson, "The Lives of the Painters of Modern Life: The Careers of Artists in France from Impressionism to Cubism," NBER Working Paper No. 6888, January 1999.*

[12] *D. W. Galenson, "Quantifying Artistic Success: Ranking French Painters — and Paintings — from Impressionism to Cubism," NBER Working Paper No. 7407, October 1999, and in* Historical Methods*, 35 (2002), pp. 5-20.*

[13] *D. W. Galenson, "Measuring Masters and Masterpieces: French Rankings of French Painters and Paintings from Realism to Surrealism," NBER Working Paper No. 8266, May 2001, and in* Histoire & Mesure*, 17 (2002), pp. 47-85.*

[14] *D. W. Galenson,* Painting outside the Lines*, Appendixes A and B; D. W. Galenson and B. A. Weinberg, "Age and the Quality of Work: The Case of Modern American Painters," NBER Working Paper No. 7122, May 1999, and in* Journal of Political Economy*, 108 (2000), pp. 761-77.*

[15] *D. W. Galenson, "The Life Cycles of Modern Artists: Theory, Measurement, and Implications," NBER Working Paper No. 9539, March 2003; D. W. Galenson, "Was Jackson Pollock the Greatest Modern American Painter? A Quantitative Investigation," NBER Working Paper No. 8830, March 2002, and in* Historical Methods*, 35 (2002), pp. 117-28; D. W. Galenson, "The Life Cycles of Modern Artists," NBER Working Paper No. 8779, February 2002, and in* World Economics*, 3 (2002), pp. 161-78; D. W. Galenson, "The New York School vs. the School of Paris: Who Really Made the Most Important Art After World War II?" NBER Working Paper No. 9149, September 2002, and in* Historical Methods*, 35 (2002), pp. 141-53.*

[16] *D. W. Galenson, "Masterpieces and Markets: Why the Most Famous Modern Paintings are not by American Artists," NBER Working Paper No. 8549, October 2001, and in* Historical Methods*, 35 (2002), pp. 63-75; D. W. Galenson, "The Disappearing Masterpiece,"* World Economics*, 3 (2002), pp. 9-24.*

[17] *D. W. Galenson and R. Jensen, "Young Geniuses and Old Masters: The Life Cycles of Great Artists from Masaccio to Jasper Johns," NBER Working Paper No. 8368, July 2001; R. Jensen, "Anticipating Artistic Behavior: New Research Tools for Art Historians," unpublished paper, University of Kentucky.*

[18] *D. W. Galenson and B. A. Weinberg, "Creative Careers: Age and Creativity among Nobel Laureate Economists," in preparation.*

[19] *See, for example, H. C. Lehman,* Age and Achievement*, Princeton: Princeton University Press, 1953, p. 249; H. Gardner,* Creating Minds*, New York: Basic Books, 1993, p. 248; F. Kermode, ed.,* Selected Prose of T. S. Eliot*, New York: Harcourt Brace Jovanovich, 1975, p. 252.*

[20] *D. W. Galenson, "Literary Life Cycles: The Careers of Modern American Poets," in preparation.*

[21] *D. W. Galenson, "A Portrait of the Artist as a Young or Old Innovator: Measuring the Careers of Modern Novelists," forthcoming, 2003.*

Capital Income Taxes

Roger H. Gordon*

In public economics the conventional wisdom has been that taxes on capital income generate high efficiency costs with few offsetting benefits.[1] Average tax rates on the return to capital are measured to be very high,[2] as are marginal tax rates on savings and investment.[3] There is a large body of research indicating that these high capital taxes have important effects on the rate of corporate investment, on the allocation of capital across uses, on whether profits are reported in the United States or offshore, and on corporate and personal financial decisions.[4]

Consistent with these forecasts of very high efficiency costs, Slemrod and I find that tax revenue would have been virtually unchanged if the United States had shifted in 1983 to an R-base under the personal and corporate income tax, thereby exempting capital income from tax.[5] Thus, adjustments that taxpayers made to reduce their tax liabilities were extensive enough to wipe out all tax revenue from taxes on capital income.

Are there any obvious distributional benefits that compensate for these high efficiency costs? At least in a small open economy, the answer is no.[6] Capital can easily escape taxation by going abroad, so that domestic workers, rather than capital, end up bearing taxes imposed on capital. Even if the economy is closed, Atkinson and Stiglitz argued, there are no distributional gains from taxing the return to savings as long as utility functions are weakly separable between leisure and consumption.[7]

Using data from 1983, Slemrod and I examined the distribution of gains and losses to individuals that would result from shifting to an R-base. We found that the existing U. S. tax system, relative to an R-base, imposed higher taxes on lower-income investors, who largely invest in taxable bonds, while imposing lower taxes on higher-income investors, who borrow heavily to buy more lightly taxed assets. These results suggest that the existing tax treatment of capital income has perverse distributional effects.

Thus, capital income taxes have large efficiency costs, collect little revenue, and have no obvious distributional gains. So, the case for using them appears to be very weak. Yet actual tax rates on capital income remain high, implying a sharp contrast between theory and practice. A major focus of my research during the last few years has been to look more closely at these above arguments, to see if there are important omissions from the theory that could call into question its implications for capital income taxes.

Capital Immobility

One questionable assumption of the standard model is that the United States is a small open economy. As documented by French and Poterba[8], individual portfolios show strong "home bias:" investors invest far more in financial securities from their own countries than can be explained easily, given the standard forecast of worldwide portfolio diversification. However, the implications of capital immobility for tax policy depend on *why* capital is immobile.

One possible reason for home bias in portfolios is real exchange rate risk. Gaspar and I examine the implications of random fluctuations in the relative values of goods produced in different countries for both portfolio choice and tax policy.[9] If random relative values of goods are reflected in random fluctuations of the domestic price level but stable exchange rates, then the model forecasts substantial home bias in equity portfolios, as a hedge against random consumer prices. But since domestic investors buy equity as a hedge, they end up bearing too much production risk from domestic firms. Capital taxes exacerbate this misallocation of risk-bearing. The fact that capital is immobile does not make taxation of capital income a plausible policy *per se*.

Distributional Effects

In two other recent papers, I reexamine whether the distributional effects of capital income taxes are as perverse as has been argued. Kalambokidis, Slemrod, and I (hereafter GKSb) recalculated the distributional effects of capital income taxes found in my 1988 paper with Slemrod, using data from 1995.[10] In spite of the major tax reform in 1986, the data for 1995 still imply rather perverse distributional effects of existing taxes, relative to an R-base. Lower income individuals still lose, middle income individuals still gain, and more so the higher their income, but now the highest income group also loses from taxes on capital income.

In another recent paper, I looked more carefully at the distributional effects of existing taxes on interest income/payments in a standard theoretical setting.[11] Unlike GKSb, this study accounts for changes in asset prices. Interest income has faced a higher effective tax rate than any other source of income from savings, because the nominal income is fully taxable. Yet at least in a closed economy, high taxation may provide distributional gains. To begin with, taxes on interest income cause the market-clearing interest rate to rise, helping lower income lenders and hurting higher-income creditors. Yet this redistribution has no efficiency cost at the margin, starting from a situation with no distortions to portfolio choice, so that it dominates using additional taxes

* *Gordon is a Research Associate in the NBER's Program on Public Economics and a Professor of Economics at University of California, San Diego. His profile appears later in this issue.*

on earnings to redistribute income. In addition, if higher ability individuals invest more in equity, even given their labor income, then portfolio distortions can help redistribute from more able to less able individuals.

In GKSb we also reestimated the revenue collected from existing taxes on income from savings and investment. In contrast to the earlier results for 1983, we find in 1995 that these taxes collected additional revenue of $91.7 billion, now positive but still very small.

Efficiency Costs

The fact that so little revenue is collected in principle could imply that the effective tax rate on capital investment is low. Kalambokidis, Slemrod, and I (hereafter GKSa) develop a theoretical model to explore the links between the revenue collected from these taxes and the size of the resulting distortion discouraging capital investment.[12] In a standard setting, there is a simple formula to go from one to the other. Since very little revenue is collected from capital taxes, the GKSa formula implies a very low effective tax rate on new investment. Apparently, investors use tax avoidance strategies not accounted for in the standard user-cost formula (as in King, Fullerton) so that the revenue collected on a marginal investment is found to be very low.[13] But tax avoidance itself can have high efficiency costs.

One mechanism for tax avoidance is debt arbitrage: investors and firms in high tax brackets borrow heavily from investors in low tax brackets in order to buy lightly taxed assets. Economists have found it very hard to test this forecast. Time-series evidence is unrevealing, because tax rates change so seldom, while cross-section evidence on publicly traded firms (reported in Compustat) works badly because effective tax rates vary among publicly traded firms largely for reasons that can independently affect firm borrowing behavior. Lee and I instead use published data from corporate tax returns for *all* corporations over 37 years, reported separately for various size categories of firms, to test whether firms borrow more when their tax rate is relatively high.[14] Even though the top corporate tax rate has not changed much over time, corporate tax rates on lower levels of earnings have changed frequently, allowing us to identify the effects of taxes by seeing how the relative use of debt changes for small versus large firms as their relative tax rates change. We find quite large effects. For example, cutting the corporate tax rate by five points (from 35 percent to 30 percent), holding personal tax rates fixed, is predicted to cause a shift from debt to equity finance of 2 percent of corporate assets.

Another mechanism for tax avoidance is income shifting between the corporate and personal tax bases. When personal and corporate tax rates differ, firms with profits tend to choose the organizational form that has a lower tax rate on profits, while firms with losses choose the form that allows them to deduct their losses subject to a higher tax rate. This income shifting was the basis for the tax shelter industry in the 1980s. Slemrod and I provided evidence on the extent of this income shifting by looking at how reported corporate rates of return have changed over time in response to differences between corporate and personal tax rates.[15] We found substantial evidence of income shifting between the corporate and personal tax bases.

While debt arbitrage and income shifting both appear to be very responsive to tax incentives, the efficiency cost arising from tax distortions to these choices appears to be small, because the size of the tax distortion affecting each choice is typically small. In fact, I point out a potential efficiency gain from the difference in corporate versus personal tax rates, through the resulting subsidy to entrepreneurial activity.[16] Given the *option* to incorporate, firms can take advantage of the lower corporate tax rates when they are profitable *and* the higher personal tax subsidy for losses when they are unprofitable. Undertaking added risk then lowers expected taxes, implying a net subsidy to risk-taking.

Cullen and I examine how the interaction between the personal and corporate tax schedules, and tax incentives more broadly,[17] affect individuals' incentives to become entrepreneurs. We measure entrepreneurial activity by the presence of noncorporate losses. Estimated effects, using data on individual tax returns from 1964 to 1993, are remarkably large. For example, a shift to a 20 percent flat tax is forecast to virtually triple the rate of entrepreneurial activity.

Capital Taxation by Local Governments

This discussion has focused on national taxes on capital income. Any discussion of subnational taxes on capital also has to take into account the possibility that individuals migrate across jurisdictions in response to tax changes. Individual migration decisions depend on differences in government expenditures as well as on differences in taxes. Wilson and I examine the effects of a marginal change in local property taxes. We find that the effect of raising taxes and expenditures together causes a drop in housing consumption per household but an increase in the number of households sufficient enough to leave the equilibrium housing stock unchanged.[18] In this setting, in contrast to a setting without migration, taxation of capital does *not* discourage capital investment.

We argue further that use of the property tax gives favorable incentives to local government officials: by providing higher quality local public services, property values and property tax payments both rise, so the budget controlled by local officials gets larger. The property tax thus can yield efficiency gains through improved incentives for public officials.[19]

Tax Evasion

These papers largely ignore tax evasion. Yet in poorer countries, underreporting of capital income is widespread: often only a small fraction of the economic income that in principle is taxable ever gets reported. Li and I document one possible response to this problem that the China government used during the 1990s.[20] Rather than taxing interest income, the

Chinese government restricted the interest rate that it paid on bank deposits. Rather than taxing the income of corporate shareholders, the government restricted the supply of equity to the market, and collected higher revenue from the issuance of new shares. In theory, these regulations are equivalent to capital income taxes, yet they can be much easier to enforce.

Offsetting Subsidies

I recently noted that distortion costs from taxes on capital income can be avoided in part through subsidized credit for new investment projects, coming perhaps from a state-owned bank.[21] While not something observed in the United States, directed credit has been common in Europe. When capital tax rates are sufficiently high, even poorly informed government subsidies to new investment may lessen the efficiency costs of these high tax rates.

Summary

Taken together, these papers provide a much less stark view of the role for capital income taxes, suggesting some distributional gains, smaller efficiency costs than have been claimed in the past, and even some reasons for efficiency gains from these taxes. In sum, theory and practice may not be as dramatically different as they have appeared.

---

[1] *For a summary of these arguments, see R. H. Gordon, "Taxation of Capital Income vs. Labour Income: An Overview," in* Taxing Capital Income in the European Union: Issues and Options for Reform*, S. Cnossen, ed., Oxford: Oxford University Press, 2000.*

[2] *See, for example, M. Feldstein and L. H. Summers, "Is the Rate of Profit Falling?"* Brookings Papers on Economic Activity*, 1977, pp. 211-27; and E. G. Mendoza, A. Razin, and L. Tesar, "Effective Tax Rates in Macroeconomics: Cross-Country Estimates of Tax Rates on Factor Income and Consumption,"* Journal of Monetary Economics*, 34 (1994), pp. 297-323.*

[3] *See, for example, M. A. King and D. Fullerton, eds.,* The Taxation of Income from Capital: A Comparative Study of the United States, the United Kingdom, Sweden, and West Germany*," Chicago: University of Chicago Press, 1984.*

[4] *For recent surveys of this literature, see the chapters by Poterba, Bernheim, Auerbach, and Hassett-Hubbard, and Gordon-Hines in A. J. Auerbach and M. Feldstein,* Handbook of Public Economics*, Vol 3 and 4, New York: Elsevier, 2002.*

[5] *As defined by the Meade Commission, an R-base allows new investment to be immediately expensed rather than depreciated, and eliminates all taxes on net income from financial securities. See* The Structure and Reform of Direct Taxation*, Meade Committee Report, Boston: Allen & Unwin, 1978; and R. H. Gordon and J. Slemrod, "Do We Collect any Revenue from Taxing Capital Income?" in* Tax Policy and the Economy*, 2 (1988), pp. 89-130.*

[6] *See, for example, R. H. Gordon, "Taxation of Investment and Savings in a World Economy,"* American Economic Review*, 76 (1986), pp. 1086-102.*

[7] *In this case, individuals with the same labor income have the same consumption patterns, regardless of their underlying ability. If the goal is to tax unobserved ability, then taxing both labor and capital income is no more effective than taxing only labor income, yet introduces added distortions. See A. B. Atkinson and J. E. Stiglitz, "The Design of Tax Structure: Direct versus Indirect Taxation,"* Journal of Public Economics*, 6 (1976), pp. 55-75.*

[8] *K. R. French and J. M. Poterba, "Investor Diversification and International Equity Markets," in* Advances in Behavioral Finance*, R. Thaler, ed., New York: Russell Sage Foundation, 1993.*

[9] *R. H. Gordon and V. Gaspar, "Home Bias in Portfolios and Taxation of Asset Income," NBER Working Paper No. 8193, March 2001, and in* Advances in Economic Analysis & Policy*, 1 (2001), pp. 1-28. Also reprinted in* Economic Policy in the International Economy*, E. Helpman and E. Sadka, eds., 2002.*

[10] *R. H. Gordon, L. Kalambokidis, and J. Slemrod "Do We Now Collect any Revenue from Taxing Capital Income," NBER Working Paper No. 9477, February 2003, forthcoming in* Journal of Public Economics.

[11] *R. H. Gordon, "Taxation of Interest Income," NBER Working Paper No. 9503, February 2003, forthcoming in* International Tax and Public Finance.

[12] *R. H. Gordon, L. Kalambokidis, and J. Slemrod, "A New Summary Measure of the Effective Tax Rate on Investment," NBER Working Paper No. 9535, March 2003, forthcoming in* Tax Burden on Capital and Labor*, P. Birch Sorensen, ed.*

[13] *GKSa does show that for some more complicated distortions, for example to portfolio choice, the true effective tax rate on investment should be between the figures implied by GKSa and King-Fullerton.*

[14] *R. H. Gordon and Y. Lee, "Do Taxes Affect Corporate Debt Policy? Evidence from U.S. Corporate Tax Return Data," NBER Working Paper No. 7433, December 1999, and in* Journal of Public Economics*, 82 (2001), pp. 195-224.*

[15] *R. H. Gordon and J. Slemrod, "Are 'Real' Responses to Taxes Simply Income Shifting between Corporate and Personal Tax Bases?" NBER Working Paper No. 6576, May 1998, in* Does Atlas Shrug: The Economics of Taxing the Rich*, J. Slemrod, ed., 2000, New York: Russell Sage Foundation.*

[16] *R. H. Gordon, "Can High Personal Tax Rates Encourage Entrepreneurial Activity?" IMF Staff Papers, 45 (1998), pp. 49-80.*

[17] *For example, progressive tax schedules discourage risk taking; risk sharing with the government can facilitate risk taking; while the payroll tax encourages entrepreneurial activity, because successful entrepreneurs can avoid this tax by incorporating and then receiving their income in the form of capital gains rather than wages. See J. B. Cullen and R. H. Gordon, "Taxes and Entrepreneurial Activity: Theory and Evidence for the U.S.," NBER Working Paper No. 9015, June 2002.*

[18] *R. H. Gordon and J. D. Wilson, "Expenditure Competition," NBER Working Paper No. 8189, March 2001, and in* Journal of Public Economic Theory*, 5 (2003), pp. 399-418.*

[19] *R. H. Gordon and J. D. Wilson, "Tax Structure and Government Behavior: Implications for Tax Policy," NBER Working Paper No. 7244, July 1999.*

[20] *R. H. Gordon and W. Li, "Government as a Discriminating Monopolist in the Financial Market: The Case of China," NBER Working Paper No. 7110, May 1999, and in* Journal of Public Economics*, 87 (2003), pp. 283-312.*

[21] *R. H. Gordon, "Taxes and Privatization," in* Public Finance and Public Policy in the New Century*, S. Cnossen, ed., 2003.*

NBER Profile: *Joshua Aizenmann*

Joshua Aizenman is a Research Associate in the NBER's Program on International Trade and Investment and a Professor of Economics at the University of California, Santa Cruz (UCSC). He received his B.A. in Mathematics and Philosophy and M.A. in Economics from Hebrew University, Jerusalem, and his Ph. D. in Economics from the University of Chicago.

Aizenman joined the faculty at UCSC in 2001 following eleven years at Dartmouth College, where he had served as the Champion Professor of International Economics. His research covers a range of issues in open economy, including commercial and financial policies, crises in emerging markets, foreign direct investment, capital controls, and exchange rate regimes. His other affiliations have included teaching and research positions at the University of Pennsylvania, the University of Chicago Graduate School of Business, and the Hebrew University in Jerusalem. He has also served as a consultant to the World Bank, the Federal Reserve Bank of San Francisco, the International Monetary Fund, and the Inter-American Development Bank.

Aizenman was born in Poland and has joint U.S./Israeli citizenship. He is married and has four children.

NBER Profile: *David Galenson*

David W. Galenson is a Research Associate in the NBER's Program on Labor Studies and a Professor of Economics at the University of Chicago. He received both his undergraduate and his graduate degrees in economics from Harvard University.

Galenson joined the University of Chicago's economics faculty in 1978 and was promoted to full professor in 1986. He has also been a visiting professor at l'Ecole des Hautes Etudes en Sciences Sociales, the University of Texas at Austin, MIT, California Institute of Technology, and the American University of Paris.

Galenson's work, earlier in his career in economic history and more recently on the economics of the art world, is widely published in economic journals. He also has authored a number of books, including *Painting Outside the Lines: Patterns of Creativity in Modern Art*, which was published in 2001, and *Mesurer l'Art*, which will be published in 2004.

Galenson lives in Chicago with Lynn Olson, a sociologist who works at the American Academy of Pediatrics. When he is not working, he enjoys playing tennis and collecting modern art.

NBER Profile: *Roger H. Gordon*

Roger H. Gordon is a Research Associate in the NBER's Program in Public Economics and a Professor of Economics at the University of California, San Diego (UCSD). His current research interests include positive and normative issues in the taxation of financial and real investments, and tax issues in transition and developing countries.

Gordon received his B.A. from Harvard and his Ph.D. at MIT. Before moving to UCSD, he was the Reuben Kempf Professor at the University of Michigan, and earlier was on the technical staff at Bell Laboratories. He is a Fellow of the Econometrics Society, a past editor and current co-editor of the *Journal of Public Economics*, and a past co-editor of the *American Economic Review*.

Gordon lives in La Jolla with his wife, NBER Research Associate Michelle J. White. When they are not working, they like to hike and bike in the hills around San Diego. They also enjoy spending time abroad, and at this point have spent time at research institutes in over ten different countries.

*

Conferences

Frontiers in Health Policy Research

The NBER's seventh annual conference on "Frontiers in Health Policy Research," organized by David M. Cutler, NBER and Harvard University, and Alan M. Garber, NBER and Stanford University, took place on June 6 in Washington, DC. The program was:

Patricia M. Danzon, NBER and University of Pennsylvania, and **Jonathan D. Ketcham**, University of California, Berkeley, "Reference Pricing of Pharmaceuticals: Evidence from Germany, the Netherlands, and New Zealand"

Mark V. Pauly, NBER and University of Pennsylvania, "Adverse Selection and the Challenges to Stand-Alone Prescription Drug Insurance"

Wiliam H. Crown and **Jonathan Maguire**, Medstat; **Ernst Berndt**, NBER and MIT; and **Kenneth E. Haver** and **Whitney P. Witt**, Massachusetts General Hospital, "Benefit Plan Design and Prescription Drug Utilization Among Asthmatics: Do Patient Copayments Matter?"

Jay Bhattacharya, NBER and Stanford University; **David M. Cutler**; **Dana Goldman**, **Michael Hurd**, and **Darius Lakdawalla**, NBER and Rand Corporation; and **Constanjin Panis**, Rand Corporation, "Disability Forecasts and Future Medicare Costs"

Nancy Beaulieu, NBER and Harvard University, "Health Plan Conversions: Are they in the Public Interest?"

Danzon and **Ketcham** describe three prototypical systems of therapeutic reference pricing (RP) for pharmaceuticals — Germany, the Netherlands, and New Zealand — and examine their effects on: the availability of new drugs; manufacturer prices, reimbursement levels, and out-of-pocket surcharges to patients; and market shares of originator and generic products. The results differ across countries in predictable ways, depending on system design and other cost control policies. The most aggressive RP system has severely limited the availability of new drugs, particularly more expensive drugs, disproportionately reduced reimbursement and sales for originator products, and exposed patients to out-of-pocket costs. The authors find little evidence that therapeutic referencing has stimulated competition.

Pauly investigates a possible predictor of adverse selection problems in unsubsidized "stand-alone" prescription drug insurance: the persistence of an individual's high spending over multiple years. Using MEDSTAT claims data and data from the Medicare survey of Current Beneficiaries, he finds that persistence is much higher for outpatient drug expenses than for other categories of medical expenses. He then uses these estimates to develop a model of adverse selection in competitive insurance markets and to show that this high relative persistence makes it unlikely that unsubsidized drug insurance can be offered for sale, even with premiums partially adjusted for risk, without a probable adverse selection death spiral. This outcome can be avoided if drug coverage is bundled with other coverage, and Pauly briefly discusses the need for comprehensive coverage or generous subsidies if adverse selection is to be avoided in private and Medicare insurance markets.

The ratio of controller-to-reliever medication use has been proposed as one measure of treatment quality for asthma patients. **Crown** and his co-authors examine the effects of plan-level, mean, out-of-pocket patient copayments for asthma medication, and other features of benefit plan design, on the use of controller medications alone, controller and reliever medications together (combination therapy), and reliever medications alone, relative to no drug treatment. They use claims data for 1995-2000. They find that the controller-reliever ratio rose steadily over 1995-2000, along with out-of-pocket payments for asthma medications. However, after controlling for other variables, plan level mean out-of-pocket copayments were not found to have a statistically significant influence on patient-level asthma treatment patterns. On the other hand, prescribing patterns among providers did influence patient-level treatment patterns; these effects differ somewhat between fee for service versus non-fee for service plans.

The traditional focus of disability research has been on the elderly, with good reason. Chronic disability is much more prevalent among the elderly, and it has more direct impact on the demand for medical care. However, it is also important to understand trends in disability among the young, particularly if these trends diverge from those among the elderly. These trends could have serious implications for future health care spending, since more disability at younger ages almost certainly translates into more disability among tomorrow's elderly, and disability is a key predictor of health care spending. Using data from the Medicare Current Beneficiary Survey and the National

Health Interview Study, **Bhattacharya** and his co-authors forecast that per capita Medicare costs will decline for the next 15 to 20 years; this is in accordance with recent projections of declining disability among the elderly. However, by 2020, the trend reverses. Per capita costs begin to rise because of growth in disability among the younger elderly. Total costs, which are the product of per capita costs and the total Medicare-eligible elderly population, will then begin to grow at an accelerating rate. Overall, cost forecasts for the elderly that incorporate information about disability among today's younger generations yield more pessimistic scenarios than those based solely on elderly datasets; this information should be incorporated into official Medicare forecasts.

Over the last decade, managed care companies have been consolidating on a regional and a national scale. More recently, not-for-profit health plans have been converting to for-profit status; frequently, this conversion has occurred as a step toward facilitating a merger or acquisition with a for-profit company. **Beaulieu** examines certain related health policy issues through the lens of a case study of the proposed conversion of the CareFirst Blue Cross-Blue Shield Company to a for-profit public stock company, and its merger with the Wellpoint Corporation. Company executives and board members argued that CareFirst lacked access to sufficient capital and faced serious threats to its viability as a financially healthy non-profit health care company. They further argued that CareFirst and its beneficiaries would benefit from merger through enhanced economies of scale and product line extensions. Critics of the proposed conversion and merger raised concerns about the adverse impacts on access to care, coverage availability, quality of care, safety net providers, and the cost of health insurance.

Analyses demonstrate that CareFirst wields substantial market power in its local market, that it is unlikely to realize cost savings through expanded economies of scale, and that access to capital concerns are largely driven by the perceived need for further expansion through merger and acquisition. Though it is impossible to predict future changes in quality of care for CareFirst, analyses suggest that quality appears to be somewhat lower in for-profit national managed care companies.

These papers will be published by the MIT Press in an annual conference volume. They are also available at "Books in Progress" on the NBER's website under the title *Frontiers in Health Policy Research*, Volume 7.

*

History of Corporate Ownership: The Rise and Fall of Great Business Families

The NBER held a conference on "The History of Corporate Ownership: The Rise and Fall of Great Business Families" in Alberta, Canada on June 21-22. NBER Research Associate Randall Morck, University of Alberta, organized this program:

Randall Morck; **Michael Percy** and **Gloria Tian**, University of Alberta; and **Bernard Yeung**, New York University, "The Rise and Fall of the Widely Held Firm in Canada"
Discussant: Jordan Siegel, MIT

William N. Goetzmann, NBER and Yale University, and **Elisabeth Köll**, Case Western Reserve University, "The History of Corporate Ownership in China"
Discussant: Dwight Perkins, Harvard University

Tarun Khanna and **Krishna Palepu**, Harvard University, "Decision or Serendipity? The Rise of India's Software Industry"
Discussant: Ashoka Mody, International Monetary Fund

Antoin E. Murphy, Trinity College Dublin, "The History of Corporate Ownership in France"
Discussant: Daniel Raff, NBER and University of Pennsylvania

Caroline Fohlin, California Institute of Technology, "Ownership and Control in German Corporations: A Long-Run Perspective on the Role of Banks"
Discussant: Alexander Dyck, Harvard University

Julian Franks and **Stefano Rossi**, London Business School, and **Colin Mayer**, University of Oxford, "The Origination and Evolution of Ownership and Control"
Discussant: Barry Eichengreen, NBER and University of California, Berkeley

Alexander Aganin, Cornerstone Research, and **Paolo Volpin**, London Business School, "The History of Corporate Ownership in Italy"
Discussant: Daniel Wolfenzon, New York University

Randall Morck, and **Masao Nakamura**, University of British Columbia, "The History of Corporate Ownership in Japan"
Discussant: Sheldon Garon, Princeton University

Peter Högfeldt, Stockholm School of Economics, "The History and Politics of Corporate Ownership in Sweden"
Discussant: Ailsa Röell, Princeton University

Marco Becht, Université Libre de Bruxelles, and **J. Bradford DeLong**, NBER and University of California, Berkeley, "Why has there been so Little Blockholding in America?"
Discussant: Richard Sylla, NBER and New York University

A long panel of corporate ownership data, stretching back to 1910, shows that the Canadian corporate sector began the century with a predominance of large pyramidal corporate groups controlled by wealthy families or individuals, and relatively few widely held firms. By the middle of the century, widely held firms had become predominant. However, from the 1970s on, there has been a marked resurgence of pyramidal groups controlled by wealthy families and individuals, corresponding to a large decline in the prevalence of widely held firms. **Morck**, **Percy**, **Tian**, and **Yeung** note that improvements in the general institutional environment and high taxes on inherited income accompany the rise of widely held firms. A sharp abatement in taxes on large states and a rise in the likely returns to political rent seeking accompany the resurgence of pyramidal groups.

Goetzmann and **Köll** examine the emergence of corporate ownership in China from the final decades of the Qing empire in the late 19th century to the early Republican period in the 1910s and 1920s. By analyzing the actual process of incorporation, the development of the legal and financial environment, and the role of the state, the authors ask whether the "top-down" approach — in which the central government established a legal framework for corporate enterprise based on Western models — and the assumption that it would work as it did for Western firms and markets was a viable approach to the modernization of a financial system traditionally dominated by family businesses and economic state patronage. Using business records from turn-of-the-century Chinese corporations, they find that the government's "top-down" approach, only insufficiently promoted the system of corporate capitalism. Although China's first corporate code contained many elements of the modern formula for privatization, it ultimately failed to effectively transform business enterprise. The authors highlight two reasons for the failure. First, the code did not sufficiently shift ownership and control from managers, previously empowered by government patronage, to shareholders. Second, the code was ineffective in stimulating the emergence of an active domestic share market that would induce family-owned firms and entrepreneurial managers to

exchange control for access to shareholder capital and the liquidity of an active exchange.

Post-independent India pursued a set of economic policies that generally curbed private sector activity and made Indian industry fragmented and uncompetitive. The one exception to this has been the Indian software industry which began to grow in the 1980s. Today the industry has more than 2500 firms, all in the private sector. The leading Indian software firms are globally competitive, highly profitable, and are growing very rapidly. They are listed on the world's major stock exchanges, and boast of a large fraction of the world's leading companies as their customers. **Khanna** and **Palepu** trace the history of the development of the Indian software development, and the role played by the private sector product, labor, and financial market intermediaries, and the domestic business groups.

Murphy attempts to show that historical phenomena have had a major impact in the determination of France's corporate ownership structure. Corporate finance is generated principally from three sources: banks, the capital market, and self-financing. If these are the three furrows leading to corporate investment, then history shows that two of them — the banks and the capital market — were subject to considerable upheaval, rendering them inoperable as channels for corporate finance for a long period in France's corporate history. Faced with restricted access to the banks and capital markets, business entrepreneurs had to rely on self-financing as a method of growing the business. In turn, self-financing enabled these entrepreneurs and their descendants to retain sizeable shareholdings in the family controlled business. Hence, from an historical perspective, it is not surprising to see French families owning such a large proportion of French corporations. Furthermore, this style of ownership ties in with the French mentality that asset ownership is an intergenerational phenomenon. The objective of holding wealth is to pass on to the next generation assets that have risen in value. There are of course other variables that help to explain the high degree of concentration of corporate ownership by families in France. One of the most important of these is the French approach to the financing of pensions. The absence of funded pension schemes has led to a far lower profile by pension funds and assurance companies in the French stock market: in 1997, pension funds and assurance companies constituted 49 percent of household savings in the United Kingdom and 30 percent in the United States as opposed to 18 percent in France.

Fohlin provides a wide-ranging description of German corporate ownership and governance, both at their roots in the nineteenth century and in more recent experience. Her discussion raises several particularly important points: 1) Corporate governance institutions — executive and supervisory boards — remained quite underdeveloped in Germany until the last quarter of the nineteenth century. Boards were generally small and grew little over the pre-war period. 2) The universal banks were a significant but not overwhelming presence in the ownership and governance of German corporations during this period of rapid heavy industrialization and economic expansion (roughly 1895-1912). Similarly, industrial firms played only a small role in the ownership and governance of other non-financial firms. (Notably, financial firms, especially the large banks, did own shares in other banks and subsidiaries and did sit on the boards of those banks.) 3) Bank involvement in corporate ownership appears to have arisen largely out of the banks' active involvement with securities issues, particularly of listed firms. Substantial holdings were rare, though earlier universal banks did sometimes unwillingly hold large stakes that they could not sell off for a period of time. 4) Bank involvement in corporate control through interlocking directorates is closely related to firms' size, sector securities issue, and stock market listing. Control rights appear to have been granted largely via proxy voting for customers who deposited (bearer) shares with the bank. 5) The combination of commercial, investment, and brokerage services within individual banking institutions may have facilitated the networking of bank and firm supervisory boards. 6) Traditional explanations of German bank-firm relationships that focus on banks' intervention in investment decisions and direct monitoring of debt contracts find little support in the current empirical analysis.

In the first half of the twentieth century, the U.K. capital markets were marked by an absence of investor protection; by the end of the century, there was more extensive protection there than virtually anywhere else in the world. The United Kingdom therefore provides an exceptional laboratory for evaluating how regulation affects the development of securities markets and corporations. **Franks**, **Mayer**, and **Rossi** investigate this issue by tracing the ownership and board composition of firms incorporated around 1900 over the subsequent 100 years and comparing the pattern of ownership and control with a sample incorporated around 1960. The authors find active securities markets at the beginning of the century; firms were able to raise substantial outside equity finance with rapid dispersion of ownership, even in the absence of investor protection. The introduction of investor protection in the second half of the century was not associated with greater dispersion of ownership but with more trading in share blocks. The authors offer an explanation as to how U.K. capital markets could flourish in the absence of investor protection.

Aganin and **Volpin** study the evolution of the stock market, the dynamics of the ownership structure of traded firms, the birth of pyramidal groups, and the growth and decline of families in Italy. They use a unique dataset covering all companies traded on the Milan stock exchange during the twentieth century. The stock market evolved over time according to a non-monotonic pattern: it was relatively more developed at the beginning and at the end than in the middle of the century. Similarly, ownership structure was more diffused in 1947 and in 2000 than in 1987. Moreover, family-controlled groups and pyramids were less common in 1947 and in 2000 than in 1987. These findings are not consistent with the view that stock market

development and ownership concentration are a monotonic function of investor protection.

Morck and **Nakamura** note that Japan's corporate sector began as *zaibatsu* family pyramids, was subjected to Soviet-style central planning, was reorganized into widely held firms, and finally organized itself into *keiretsu* corporate groups. Both *zaibatsu* and *keiretsu* were probably rational responses to weak institutions, a talent shortage, abundant private benefits of control, and an environment where political rent seeking earns high returns. Other common justifications for corporate groups are at best of second-order importance. These include economies of scope and scale and internal capital allocation. The latter provides short-term benefits, but undermines the group in the longer term. Once dominant, such groups lobby for institutional reforms that further their dominance. Examples include the suppression of the bond market in postwar Japan, managerial entrenchment in *keiretsu* firms, and an increasing importance of rent seeking as a source of competitive advantage. This lobbying almost surely did not enhance social welfare.

Högfeldt explains that because of strong Social Democratic political influence since 1932, control of the largest listed firms in Sweden has remained firmly in the hands of a few old families and banks via pyramids and by extensive use of dual-class shares. A combination of wealth, inheritance, and capital gains taxes locked capital into the established firms, while heavy tax subsidization of retained earnings and R and D spending supported growth by stimulating investments, often in very large projects joint with the government. Addition of young fast-growing firms has been very limited, because accumulation of private fortunes based on entrepreneurship and equity financing was disfavored and treated at significant tax disadvantages for ideological reasons. Of the 50 largest listed firms today, 31 were founded before 1914, only eight in the post-war period, and none after 1970. Being both controlling owners and major providers of loans to the largest listed firms, the two leading banks acted more like long-term bondholders than risk-taking capitalists. This fit the Social Democrats' vision of large-scale capitalist firms run in the interests of the firms' stakeholders — *social firms without owners* — particularly well. Taming of capitalism did not mean immediate takeover of private ownership as long as the capitalists invest and the export-oriented corporate sector remains efficient enough to support a growing, tax-financed public sector with strong egalitarian ambitions. Listed firms in effect did not have to disperse ownership and dilute benefits of control in order to raise new capital, as their dependence on equity markets was limited; on average less than 1 percent of investments are financed by new issues. The historical path of persistent social democratic policies generated high growth rates until the 1970s; then the negative effects of a stale, corporatist society controlled by political and economic powers that have been heavily entrenched for decades resulted in stagnation. The lack of economic and social dynamics is manifest in the dominance of very large, old family-controlled firms, and by the over-sized public sector that redistributes incomes, but not property rights, and wealth by encouraging outsiders to create new firms and fortunes.

A hundred years ago, American corporate control looked "normal": large financial intermediaries and plutocratic families were controlling blockholders in the economy's large and growing Chandlerian enterprises. By 50 years ago, the United States had become truly exceptional: blockholding had become rare, and managers largely autonomous. Roe (1994) argues that the political ethos of America was too hostile to the exercise of financier power for blockholding intermediaries to survive. La Porta *et al.* (1999) paint a picture of blockholding around the world as a response to weak protection of minority shareholders, which suggests that American shareholders been able to afford diversification because of the powerful and effective Delaware's Chancery. **Becht** and **DeLong** say that the situation is more complicated. Yes, America's deep equity markets amplified the benefits of diversification. Yes, the Delaware Chancery protects minority shareholder rights. Yes, there is a powerful Populist-Progressive current in American politics. But key historical accidents played as large a role as the forces adduced by Roe and La Porta *et al.* in creating this form of American exceptionalism.

Taxation and Saving

An NBER Conference on Taxation and Saving, organized by James M. Poterba of NBER and MIT, took place on August 1 and 2. The following papers were discussed:

Andrew A. Samwick, NBER and Dartmouth College, "Mutual Fund Choice in 529 Plans: Federal Tax Advantages and Local Monopolies"
Discussant: Len Burman, Urban Institute

Susan Dynarski, NBER and Harvard University, "Who Benefits from the Education Saving Incentives? Income, Educational Expectations, and the Value of the 529 and Coverdell"
Discussant: Jeffrey Brown, NBER and University of Illinois

Gary Engelhardt, Syracuse University, and **Brigitte Madrian**, NBER and University of Chicago, "Tax-Deferred Saving and Participation in Employee Stock Purchase Plans"
Discussant: Roger H. Gordon, NBER and University of California, San Diego

Austan Goolsbee, NBER and University of Chicago, "How Do Tax Rates Affect Executives' Decisions About Corporate Stock?"
Discussant: William M. Gentry, NBER and Columbia University

Wojciech Kopczuk, NBER and Columbia University, and **Emmanuel Saez**, NBER and University of California, Berkeley, "Top Wealth Shares in the United States, 1916-2000: Evidence from Estate Tax Returns"
Discussant: Scott Weisbenner, NBER and University of Illinois

David Joulfaian, U.S. Department of the Treasury, and **Kathleen M. McGarry**, NBER and University of California, Los Angeles, "Estate and Gift Tax Incentives and Inter Vivos Giving"
Discussant: Alan J. Auerbach, NBER and University of California, Berkeley

Daniel R. Feenberg, NBER, and **James M. Poterba**, "The Alternative Minimum Tax and Effective Marginal Tax Rates"
Discussant: Rosanne Altshuler, Rutgers University

Jagadeesh Gokhale, Federal Reserve Bank of Cleveland, and **Laurence J. Kotlikoff**, NBER and Boston University, "The Impact on Consumption and Saving of Current and Future Fiscal Policies"
Discussant: Jonathan S. Skinner, NBER and Dartmouth College

James M. Poterba, "Valuing Assets in Retirement Saving Accounts"
Discussant: William Gale, Brookings Institution

The passage of tax reform legislation in 2001 opened up new tax-advantaged opportunities for families to save for college educations through 529 plans. Unlike other tax-advantaged savings accounts, 529 plans must be chartered by states. Several factors, including more favorable state income tax treatment of contributions or withdrawals, suggest the possibility of a "home bias" in which residents of a state tend to invest disproportionately in their own state's plan. Home bias confers a local monopoly rent on the mutual fund family that manages the 529 plans. **Samwick** analyzes the extent to which that rent appears in the fee structure and performance characteristics of mutual funds that are made available in 529 plans. While examples can be found of poor offerings in 529 plans, the general result is that mutual fund companies do not systematically offer higher fee, lower performing funds to their captive market than to their retail market.

Dynarski calculates the incentives created by the 529 and Coverdell tax-advantaged savings accounts (ESA) and studies how these incentives vary by income. She finds that the advantages of the 529 and ESA rise sharply with income, for three reasons. First, those with the highest marginal tax rates benefit the most from sheltering income, gaining in both absolute and relative terms. Second, the accounts are risky for families whose children may not attend college, because account holders are penalized if the accounts are not used for schooling. Dynarski calculates the minimum probabilities of college attendance that are required for the 529 and ESA to have expected returns at least as high as alternative saving vehicles. She finds that, for households with incomes below $57,000, these break-even probabilities are higher than the observed rates at which their children go to college. Third, the financial aid system reduces aid disproportionately for those families that hold their assets in the 529 or ESA rather than in conventional saving vehicles. The financial aid "tax" is particularly high for the ESA; for families on the margin of receiving need-based financial aid, ESA returns net of income and aid taxes are negative. Since the highest-income families are not affected by the aid tax, this further intensifies the positive correlation between income and the advantages of the tax-advantaged college savings accounts.

Employee stock purchase plans (ESPPs) are designed to promote employee stock ownership in the firm and to provide another tax-deferred vehicle for capital accumulation, along with traditional pensions and 401(k)s. **Englehardt** and **Madrian** analyze the incentives that employees face to participate in an ESPP, and find that 401(k) saving with employer matching contributions dominates ESPP saving for retirement on an after-tax basis for all but the shortest horizons. Then the

authors empirically examine ESPP participation using administrative data from 1997-2001 for a large health services company that employs over 30,000 people. The picture that emerges suggests that participation in and contributions to the ESPP are relatively large in magnitude, and the 401(k) and ESPP plans do not compete for the first dollar of employer-based plan saving. Rather, employees tend to exhaust saving opportunities in the 401(k) first, and then to contribute marginal saving to the ESPP. However, employees appear to be backward-looking when forecasting future returns and making company stock purchase commitments. This suggests that employees may not be fully aware of the risk of company stock and the benefits of diversification. Taxes do not seem to be a prime determinant of ESPP participation.

Goolsbee uses data on executive compensation during 1992-2000, matched to information on federal and state marginal tax rates on different types of income, to examine the impact of taxes on executives' decisions about corporate stock. He shows that lower capital gains taxes correspond to executives significantly increasing their holding of corporate stock. He then illustrates how interactions between ordinary income taxes, capital gains taxes, and corporate income taxes interact in the executives' decision on whether to exercise their stock options early. When capital gains taxes fall, as in 1997, executives have an incentive to exercise early and to pay taxes on part of the gain at ordinary income rates now in order to get future appreciation of the stock taxed at the lower capital gains rates in the future. The estimates confirm the model, and suggest that executives do have some inside information into the future prospects of the company, because firms whose stocks ends up growing faster are more likely to exercise early. Interestingly, the executives appear to place almost no weight on the corporate tax consequences of their exercise decisions, because the corporate income tax rate facing their companies has no influence on their behavior.

Using estate tax return data, **Kopczuk** and **Saez** present new homogeneous series on top wealth shares from 1916 to 2000 in the United States. Top wealth shares were very high at the beginning of the period but have been hit sharply by the Great Depression, the New Deal, and World War II shocks. Those shocks have had permanent effects. Following a decline in the 1970s, top wealth shares recovered in the early 1980s, but they are still much lower in 2000 than in the early decades of the century. Most of the changes the authors document are concentrated among the very top wealth holders, with much smaller movements for groups below the top 0.1 percent. Consistent with the Survey of Consumer Finances results, top wealth shares estimated from estate tax returns display no significant increase since 1995. Evidence from the Forbes 400 richest Americans suggests that only the super-rich have experienced significant gains relative to the average over the last decade. The most plausible explanations for the facts have been the development of progressive income and estate taxation, which has dramatically impaired the ability of large wealth holders to maintain their fortunes, and the democratization of stock ownership, which now spreads stock market gains and losses much more widely than in the past.

A very small but growing body of the literature has examined the pattern of lifetime gifts. Some of these studies relied on cross-sectional survey and administrative records; others have employed aggregate time-series data on gifts. However, little is known about the pattern of giving during the life cycle. For instance, two questions have yet to be explored: how gifts are allocated over life and how frequently gifts are made. This may be determined by wealth and age, but taxes also may play an important role. To address these questions, and to explore the role of taxes, **Joulfaian** and **McGarry** use two datasets. The first consists of several waves of the HRS/AHEAD survey, and the second uses longitudinal data on gifts from gift tax returns that are linked to estate tax returns. The administrative records are particularly useful in studying giving patterns of the wealthy, but not in the case of the less wealthy, where the survey data has a comparative advantage. The findings suggest that much of the giving takes place late in life. While these findings also suggest that taxes are an important consideration in the timing of transfers of the rich, this timing is not universally consistent with a tax minimization strategy.

Feenberg and **Poterba** examine the impact of the Alternative Minimum Tax on the weighted average marginal tax rates that apply to various components of taxable income. They also consider the impact of various AMT reform proposals on the number of AMT taxpayers and the total revenue collected from the AMT over the next decade. Using the NBER TAXSIM model to project federal personal income tax liabilities and AMT liabilities between 2003 and 2013, the authors' projections show that modest increases in the AMT exclusion level have substantial effects on the number of AMT taxpayers. Further, indexing the AMT parameters would reduce the number of households with AMT liability from 36 million to 14 million in 2010. The presence of the AMT has only a modest impact on the average marginal tax rates on most income flows because some AMT taxpayers face higher marginal tax rates and others lower tax rates as a result of the tax.

Gokhale and **Kotlikoff** investigate the potential impact of alternative fiscal policies on current consumption and saving. Their analysis uses households drawn from the Federal Reserve's 1995 Survey of Consumer Finances. This dataset provides detailed information on household earnings, assets, housing, demographics, and retirement plans. The policies the authors consider are: tax hikes, tax cuts, Social Security benefit cuts, and the elimination of tax-deferred saving. The results are influenced by the fact that a significant minority of their sample is liquidity-constrained, and thus more responsive to current than to future policy changes, no matter how long their duration. The results also are very sensitive to the particular policy being enacted. Income tax changes, for example, have little effect on the consumption/saving of low-

income households for the simple reason that their income tax liabilities are relatively small. And, Social Security benefit cuts have only minor effects on the young, because they will occur so far in the future, and because the young generally are liquidity constrained. One the other hand, eliminating tax-deferred saving will have no effect on current retirees, but greatly influences the spending of the young, since such a policy would relax their liquidity constraints. Each of the policies considered has a quite sizeable effect on the current consumption and saving behavior of a substantial subset of this sample, though.

Assets in retirement saving plans have become an important component of net worth for many households. While many studies compare household balances in tax-deferred retirement accounts such as 401(k) plans with the amount held in other financial assets outside these accounts, these different asset components are not directly comparable. Taxes, and in some cases penalties, are due when assets are withdrawn from retirement saving plans. These factors can make assets inside retirement accounts less valuable than assets outside these accounts, particularly for those who are considering withdrawing assets from the tax-deferred accounts in the near future. For younger households who do not plan to withdraw tax deferred assets for many years, there is a countervailing factor — the opportunity for tax-free compound returns in retirement accounts — that can make assets in such accounts more valuable than similar assets outside such accounts. For a long-horizon retirement saver, a dollar inside a tax-deferred retirement saving account may be more valuable than a dollar outside such an account, even though the payouts of principal from the retirement account will be taxed at the time of distribution while the principal outside such accounts is untaxed. **Poterba** illustrates the potential differences in the value of assets inside and outside tax-deferred accounts. He draws on a range of data sources to calibrate the value of the tax burden, and the benefit of compound growth, for assets held in retirement accounts, and describes the differences in relative valuation for households of different ages.

These papers will be published in a forthcoming issue of the National Tax Journal. They will also be available at "Books in Progress" on the NBER's website.

*

Japan Conference

The NBER, Centre for Economic Policy Research (CEPR), Center for International Reseach on the Japanese Economy (CIRJE), and European Institute of Japanese Studies (EIJS) jointly organized a conference on the Japanese economy in Tokyo on September 19-20. The co-chairs of the meeting were: Magnus Blomstrom, NBER and Stockholm School of Economics; Jennifer Corbett, Australian National Union; Fumio Hayashi, NBER and the University of Tokyo; Anil K Kashyap, NBER and the Graduate School of Business, University of Chicago; and David Weinstein, NBER and Columbia University. The following papers were discussed:

Alan J. Auerbach and **Maurice Obstfeld**, NBER and University of California, Berkeley, "The Case for Open-Market Purchases in a Liquidity Trap"
Discussant: Susanto Basu, NBER and University of Michigan

Gunter Coenen and **Volker Wieland**, European Central Bank, "The Zero-Interest-Rate Bound and the Role of the Exchange Rate for Monetary Policy in Japan"
Discussant: David Gruen, Australian Department of the Treasury

I. Serdar Dinc, University of Michigan, and **Patrick M. McGuire**, Bank for International Settlements, "Did Investors Regard Real Estate as 'Safe' during the 'Japanese Bubble' in the 1980s?"
Discussant: Kenneth J. Singleton, NBER and Stanford University

Ricardo J. Caballero, NBER and MIT; **Takeo Hoshi**, NBER and University of California, San Diego; and **Anil K Kashyap**, "Zombie Lending and Depressed Restructuring in Japan"
Discussant: Chang-Tai Hsieh, NBER and Princeton University

Robert Dekle, University of Southern California, and **Kenneth Kletzer**, University of California, Santa Cruz, "The Japanese Banking Crisis and Economic Growth: Theoretical and Empirical Implications of Deposit Guarantees and Weak Financial Regulation"
Discussant: David Smith, Federal Reserve Board

Tetsuji Okazaki, University of Tokyo, and **Michiru Sawada**, Hitotsubashi University, "Bank Merger Movement and Evolution of Financial System: Experiences in Prewar Japan"
Discussant: Takeo Hoshi

Yoshiro Miwa, University of Tokyo, and **J. Mark Ramseyer**, Harvard University, "Who Appoints Them, What Do They Do? Evidence on Outside Directors from Japan"
Discussant: Randall Morck, NBER and University of Alberta

Gauti Eggertsson, International Monetary Fund, and **Michael Woodford**, NBER and Princeton University, "Optimal Monetary Policy in a Liquidity Trap"
Discussant: Kazuo Ueda, Bank of Japan

The prevalent thinking about liquidity traps suggests that the perfect substitutability of money and bonds at a zero short-term nominal interest rate renders open market operations ineffective for achieving macroeconomic stabilization goals. **Auerbach** and **Obstfeld** show that even if this were the case, there would remain a powerful argument for large-scale open market operations as a fiscal policy tool. This same reasoning implies that open market operations *will* be beneficial for stabilization as well, even when the economy is expected to remain mired in a liquidity trap for some time. Thus, the microeconomic fiscal benefits of open market operations in a liquidity trap go hand in hand with standard macroeconomic objectives. Motivated by Japan's recent economic experience, the authors use a dynamic general-equilibrium model to assess the welfare impact of open market operations for an economy in Japan's predicament. They argue that Japan can achieve a substantial welfare improvement through large open market purchases of domestic government debt.

Coenen and **Wieland** study the role of the exchange rate in conducting monetary policy in an economy with near-zero nominal interest rates as Japan has experienced since the mid-1990s. This analysis is based on an estimated model of Japan, the United States, and the euro area with rational expectations and nominal rigidities. Te authors first provide a quantitative analysis of the impact of the zero bound on the effectiveness of interest rate policy in Japan in terms of stabilizing output and inflation. Then they evaluate three concrete proposals that focus on depreciation of the currency as a way to ameliorate the effect of the zero bound and to evade a potential liquidity trap. Finally, they investigate the international consequences of these proposals.

It is well known that Japanese banks increased their exposure to land assets and the real estate sector in the latter half of the 1980s, and that this became a primary factor in the non-performing loan problem that emerged in the 1990s. What is less clear, however, is whether this increased exposure was the result of active risk taking, and whether banks and other market participants regarded land and real estate assets as "risky" while real estate prices were increasing dramatically. To address this issue, **Dinc** and **McGuire** rely on real estate data contained in corporate balance sheets to estimate the market sentiment toward land assets during 1985-9. They find that the systemic risk of manufacturing

companies increased with their real estate holdings but not with other balance sheet assets. This indicates that market participants regarded real estate holdings as riskier than the main operations of manufacturing companies during the "bubble period," even if they may not have foreseen the subsequent crash in real estate prices.

Caballero, **Hoshi**, and **Kashyap** propose a bank-based explanation for the decade-long Japanese slowdown. They start with the well-known observation that most large Japanese banks would be out of business if regulators forced them to recognize all their loan losses immediately. Because of this, the banks keep many "zombie firms" alive by "evergreening" their loans: rolling over loans that they know will not be collected. Thus, the normal competitive outcome, whereby the zombies would shed workers and lose market share, is being thwarted. The authors highlight the restructuring implications of this zombie problem: the counterpart of the congestion created by the zombies is a reduction of the profits for potential new and more productive entrants, which discourages their entry. In this context, even solvent banks see no particularly good lending opportunities in Japan. Essentially Japan has reached the situation of having bankrupt banks lend to bankrupt firms, and in this scenario the private sector struggles. The authors confirm their key predictions that zombie-dominated industries exhibit more depressed job creation, lower productivity, and greater excess capacity.

Dekle and **Kletzer** use an endogeneous growth model with financial intermediation to show how government policies towards the financial sector can lead to banking crises and persistent growth slumps. The model shows how government deposit guarantees and regulatory forbearance can lead to permanent declines in the growth rate of the economy. The effects of inadequate prudential supervision on asset price dynamics under perfect foresight also are derived in the model. The policies that are used in the analysis are based on essential features of Japanese financial regulation. The implications of the model then are compared to the experience of the Japanese economy and financial system during the 1990s. The authors find that the dynamics predicted by their model are generally consistent with the recent behavior of economic aggregates, asset prices, and the banking system for Japan. One policy implication of the model is that the impact on future economic growth depends on the length of time the government fails to enforce loan-loss reserving by banks.

Okazaki and **Sawada** examine the effects of bank consolidations on the financial system, using data on the Japanese banking industry before the Second World War, when the first bank merger movement occurred and deposit insurance did not exist. The focus of their analysis is governance structure and the performance of banks. The authors find that consolidations had the effect of excluding an unfavorable interlocking directorate between banks and their related firms, especially in the case of absorbing consolidations. The authors also confirm that consolidations had a positive effect on deposit growth, but not on bank profitability.

Miwa and **Ramseyer** assemble data on the 1,000 largest exchange-listed Japanese firms from 1986-94 and explore which firms tend to appoint outsiders to their boards. They find that appointments are decidedly nonrandom. Firms appoint directors from the banking industry when they borrow heavily, when the firm has fewer mortgageable assets, or when the firm itself is in the service and finance industry. Firms appoint retired government bureaucrats when they are in construction and sell a large fraction of their output to government agencies. And, firms appoint other retired business executives when they have a dominant parent corporation or when they are in the construction industry and sell heavily to the private sector. The authors then ask whether firms with more outside directors outperform those with fewer. They find that they do not. Instead, as the logic of market competition predicts, board composition seems endogenous. Given that the composition does not change from the thriving 1980s to the depressed 1990s, optimal board structure seems not to depend on the macroeconomic environment.

Eggertsson and **Woodford** consider the consequences for monetary policy of the zero floor for nominal interest rates. The zero bound can be a significant constraint on the ability of a central bank to combat deflation. The authors show, in the context of an intertemporal equilibrium model, that open market operations, even "unconventional" ones, are not effective if they do not change expectations about the future conduct of policy. Nonetheless, a credible commitment to the right sort of history-dependent policy can largely mitigate the distortions created by the zero bound. In this model, optimal policy involves a commitment to adjust interest rates so as to achieve a time-varying price-level target when it is consistent with the zero bound. The authors also discuss ways in which other central bank actions, while irrelevant apart from their effects on expectations, may help to make a central bank's commitment to its target credible. They also consider implications for the policy options currently available for overcoming deflation in Japan.

New Directors Elected by NBER Board

At its annual meeting in September, the NBER's Board of Directors elected five new directors. The newest at-large NBER Board member is Jessica P. Einhorn. She is Dean of the Paul H. Nitze School of Advanced International Studies at Johns Hopkins University.

Richard B. Berner, Managing Director and Chief U.S. Economist for Morgan Stanley Global Economic Research, replaces Richard D. Rippe as the representative of the National Association for Business Economics. Professor Ray C. Fair replaces William Brainard as Yale University's representative on the NBER's Board of Directors. Thea Lee, Assistant Director of Public Policy for the AFL-CIO (American Federation of Labor and Congress of Industrial Organizations), will replace David Smith as the representative from the AFL-CIO. Jeffrey M. Perloff, a member of the Department of Agricultural and Research Economics at the University of California, Berkeley, will replace Mark Drabenstott as the NBER's representative from the American Agricultural Economics Association.

These new Board members will be profiled in future issues of the NBER Reporter.

Rajan Heading to the IMF

NBER Research Associate Raghuram G. Rajan, who directs the NBER's Program on Corporate Finance, has been appointed Economic Counsellor and Director of the Research Department at the International Monetary Fund. He will succeed another NBER researcher, Kenneth S. Rogoff, who returned to Harvard University's Economics Department in September.

Rajan is also the Joseph L. Gidwitz Professor of Finance at the University of Chicago Graduate School of Business. He has taught at MIT, Northwestern University, and the Stockholm School of Economics, and been a consultant to the Federal Reserve Board, the World Bank, and the IMF. Other NBER researchers who have served in the same capacity at the IMF include Jacob A. Frenkel and Michael L. Mussa.

Jolls to Co-Direct NBER's Program on Law and Economics

Christine Jolls, an NBER Research Associate and Professor of Law at Harvard Law School (HLS), is joining her Harvard colleague Steven Shavell as co-director of the NBER's Program of Research on Law and Economics. Jolls holds a B.A. from Stanford University, a J.D. from Harvard Law School, and a Ph.D. in economics from MIT. Before joining the HLS faculty, she clerked for Judge Stephen F. Williams on the U.S. Court of Appeals for the D.C. Circuit in 1995-6 and for Justice Antonin Scalia of the U.S. Supreme Court in 1996-7.

Twenty-fourth NBER Summer Institute Held in 2003

In the summer of 2003, the NBER held its twenty-fourth annual Summer Institute. More than 1200 economists from universities and organizations throughout the world attended. The papers presented at dozens of different sessions during the four-week Summer Institute covered a wide variety of topics. A complete agenda and many of the papers presented at the various sessions are available on the NBER's web site by clicking Summer Institute 2003 on our conference page, found at: www.nber.org/confer.

Economic Fluctuations and Growth

The NBER's Program on Economic Fluctuations and Growth met in Cambridge on July 19. Organizers Andrew Abel, NBER and University of Pennsylvania, and Valerie Ramey, NBER and University of California, San Diego, chose these papers for discussion:

Laura L. Veldkamp, INSEAD, "Media Frenzies in Markets for Financial Information"
Discussant: John V. Leahy, NBER and New York University

Markus K. Brunnermeier, Princeton University, and **Jonathan A. Parker**, NBER and Princeton University, "Optimal Expectations"
Discussant: David Laibson, NBER and Harvard University

Fatih Guvenen, University of Rochester, "A Parsimonious Macroeconomic Model for Asset Pricing: Habit Formation or Cross-Sectional Heterogeneity?"
Discussant: John Y. Campbell, NBER and Harvard University

Change-Tai Hsieh, NBER and Princeton University, and **Peter J. Klenow**, Federal Reserve Bank of Minneapolis, "Relative Prices and Relative Prosperity," (NBER Working Paper No. 9701)
Discussant: Samuel S. Kortum, NBER and University of Minnesota

Robert E. Hall, NBER and Stanford University, "Wage Determination and Employment Fluctuations"
Discussant: Garey Ramey, University of California, San Diego

Olivier J. Blanchard, NBER and MIT, and **Thomas Philippon**, MIT, "The Decline of Rents, and the Rise and Fall of European Unemployment"
Discussant: Jordi Gali, NBER and CREI

Promising emerging equity markets often witness investment herds and frenzies, accompanied by an abundance of media coverage. Complementarity in information acquisition can explain these anomalies. Because information has a high fixed cost of production, its equilibrium price is low when its quantity is high. Investors all buy the most popular information because it has the lowest price. Given two identical asset markets, investors herd: asset demand is higher in the market with abundant information because information reduces risk. By lowering risk, information raises the asset's price. Transitions between low-information/low-asset-price and high-information/high-asset-price equilibriums raise price volatility and create price paths resembling periodic frenzies. Using equity data and a new panel data set of news counts for 23 emerging markets, **Veldkamp** shows that when asset market volatility increases, news coverage intensifies, and that more news is correlated with higher asset prices.

Brunnermeier and **Parker** introduce a tractable structural model of subjective beliefs. Forward-looking agents care about expected future utility flows, and hence are happier now if they believe that better outcomes are more likely. On the other hand, expectations that are biased towards optimism worsen decisionmaking, leading to poorer realized outcomes on average. Optimal expectations balance these forces by maximizing the lifetime well-being of an agent. The authors apply their optimal expectations framework to three different economic settings. In a portfolio choice problem, agents overestimate the return on their investment and may invest in an asset with negative expected excess return if sufficiently positively skewed. In general equilibrium, agents' prior beliefs are endogenously heterogeneous, leading to gambling. Finally, in a consumption-saving problem with stochastic income, agents are both overconfident and overoptimistic, and consume more than implied by rational beliefs early in life.

Guvenen studies the asset pricing

implications of a parsimonious two-agent macroeconomic model with two key features: limited participation in the stock market and heterogeneity in the elasticity of intertemporal substitution. The parameter values for the model are taken from the business cycle literature and are not calibrated to match any financial statistic. Yet, with a risk aversion of two, the model is able to explain a large number of asset pricing phenomena, including: a high equity premium and a low risk-free rate; a counter-cyclical risk premium, volatility, and Sharpe ratio; predictable stock returns with coefficients and R^2 values of long-horizon regressions matching their empirical counterparts, among others. In addition the model generates a risk-free rate with low volatility (5.7 percent annually) and with high persistence. Guvenen also shows that the similarity of her results to those from an external habit model is not a coincidence: the model has a reduced form representation which is remarkably similar to Campbell and Cochrane's framework for *asset pricing*. However, the *macroeconomic implications* of the two models are quite different, favoring the limited participation model. Moreover, she shows that policy analysis yields dramatically different conclusions in each framework.

The positive correlation between purchasing power parity (PPP) investment rates and PPP income levels across countries is one of the most robust findings of the empirical growth literature. **Hsieh** and **Klenow** show that this relationship is driven almost entirely by differences in the price of investment relative to output across countries. When measured at domestic prices rather than at international prices, investment rates are barely correlated with PPP incomes. The authors find that the high relative price of investment in poor countries is attributable solely to the low price of consumption goods in poor countries. Investment prices are no higher in poor countries than in rich countries. These facts suggest that the low PPP investment rates in poor countries are not caused by low savings rates or by high tax or tariff rates on investment. Instead, poor countries appear to be plagued by low efficiency in producing investment goods and in producing exportables to trade for machinery and equipment.

After a recession, the aggregate labor market is slack: employment remains below normal and recruiting efforts of employers, as measured by vacancies, are low. A model of matching frictions explains the qualitative responses of the labor market to adverse shocks, but requires implausibly large shocks to account for the magnitude of observed fluctuations. The incorporation of wage-setting frictions vastly increases the sensitivity of the model to driving forces. **Hall** develops a new model of wage friction. The friction arises in an economic equilibrium and satisfies the condition that no market participant has an unexploited opportunity for unilateral improvement. The wage friction neither interferes with the efficient formation of employment matches nor causes inefficient job loss. Thus it provides an answer to the fundamental criticism previously directed at sticky-wage models of fluctuations.

Blanchard and **Philippon** develop three propositions: 1) Higher product and capital market competition and integration since the 1970s have led to a steady decline in rents and to smaller and briefer quasi-rents. 2) These changes are likely to increase efficiency and output in the long run, but it may take time for economic actors to fully understand them and to adapt. In the presence of collective bargaining and slow learning by unions, these changes can generate first a rise and then a decline in unemployment. This fits the general evolution of unemployment in Europe since the 1970s. 3) The speed of learning by unions is likely to depend on the degree of trust between labor and capital. The empirical evidence suggests that differences in trust can explain much of the difference in the evolution of unemployment across countries. Countries with lower trust have had more of an increase, and a later turnaround, in unemployment.

*

The Chinese Economy

The NBER's Working Group on the Chinese Economy, organized by Shang-Jin Wei, NBER and International Monetary Fund, met in Cambridge on October 3. The participants in this first meeting of the working group included NBER Research Associates and Faculty Research Fellows who had participated in a joint NBER-CCER (China Center for Economic Research) meeting in Beijing, plus a number of experts on the Chinese economy who teach at American universities. The formal meeting was preceded by a dinner at which Professor Dwight Perkins of Harvard spoke about current issues facing the Chinese economy. The meeting program was:

Robert C. Feenstra, NBER and University of California, Davis, and **Gordon H. Hanson**, NBER and University of California, San Diego, "Ownership and Control in International Outsourcing: Estimating the Property-Rights Theory of the Firm"
Discussant: Chenggang Xu, London School of Economics

Chun-Chung Au, Brown University, and **J. Vernon Henderson**, NBER and Brown University, "Estimating Net Urban Agglomeration Economies with an Application to China"
Discussant: Mary Amiti, International Monetary Fund

Genevieve Boyreau-Debray, World Bank, and **Shang-Jin Wei**, "Can China Grow Faster? A Diagnosis on the Fragmentation of the Domestic Capital Market"
Discussant: Chun Chang, University of Minnesota

Hehui Jin and **Barry R. Weingast**, Stanford University, and **Yingyi Qian**, University of California, Berkeley, "Federalism, Chinese Style I: Fiscal Incentives and Regional Development" and "Federalism and Chinese Style II: Economic Decentralization and Political Centralization"
Discussant: Barry Naughton, University of California, San Diego

Wei Li, University of Virginia, "Measuring Corruption under China's Dual-Track System"
Discussant: Loren Brandt, University of Toronto

Feenstra and **Hanson** develop a simple model of international outsourcing and apply it to processing trade in China. They observe China's processing exports, broken down by *who owns the plant* and by *who controls the inputs* that the plant uses. Multinational firms engaged in export processing in China tend to split factory ownership and input control with managers in China: the most common outcome is to have foreign factory ownership but Chinese control over the inputs. To account for this organizational arrangement, the authors appeal to a property-rights model of the firm. Multinational firms and the Chinese factory managers with whom they contract divide the surplus associated with export processing by Nash bargaining. Threat-point payoffs are subject to a loss in human capital. In their benchmark estimates, this loss in human capital is estimated at 33-40 percent in all provinces except the southern coast, but only about 22 percent in Fujian, Guangdong, and Hainan. The probability of legal enforcement of contracts has a similar pattern and is lowest in the southern coastal provinces and highest in Beijing.

Au and **Henderson** model and estimate net urban agglomeration economies for cities. Economic models of cities postulate an inverted-*U* shape of real income per worker against city employment, where the inverted-*U* shifts with industrial composition across the urban hierarchy of cities. This relationship has never been estimated, in part because of data requirements. China has the necessary data and context. The authors find that the benefits of urban agglomeration are high: real incomes per worker rise sharply with increases in city size from a low level. They level out nearer the peak, but then decline very slowly past the peak. Au and Henderson find that a large fraction of cities in China are undersized, because of strong migration restrictions, and they find large income losses from these restrictions.

Boyreau-Debray and **Wei** look at the financial side of Chinese economic development. One serious drawback of the Chinese financial system (beyond the bad-loans problem in its banking sector) may be the segmentation of the internal capital market, but it has not received much research attention. This paper fills the void, using two standard tools from international finance to analyze internal financial integration across 28 Chinese provinces from 1978-2000. The first test, proposed by Feldstein and Horioka (1980) and modified in the subsequent literature, examines the correlation between local investment and local saving. The second test, drawn from the risk-sharing literature, uses consumption data to evaluate financial integration. Both tests confirm a similar (and somewhat surprising) picture: capital mobility within China is low! More precisely, it is much lower than within financially integrated countries, such as Japan or the United States. In fact, the degree of interprovincial capital mobility within China is similar to the level observed across national borders among the OECD countries. Furthermore, the degree of internal financial integration appears to have decreased significantly, rather than increased, in the 1990s relative to the earlier period. Finally, the authors document that the govern-

ment (as opposed to the private sector) tends to systematically re-allocate capital from more productive regions to less productive ones. In this sense, a smaller role for the government in the financial sector might increase the growth rate of the economy.

The theory of market-preserving federalism stresses the importance of fiscal decentralization and the incentives of government on market development. Using a panel dataset from China, **Jin**, **Quian**, and **Weingast** investigate the changing fiscal relationship between the central and provincial governments before and after reform. They first find a much higher correlation, about four times, between the provincial government's budgetary revenue collection and its budgetary expenditure after the reform than before the reform. This is evidence of much stronger *ex post* fiscal incentives for provincial governments. The authors also find that stronger *ex ante* fiscal incentives, measured by the contractual marginal retention rate of the provincial government in its budgetary revenue collection, imply faster development of the provincial economy. This is evidence of the impact of fiscal incentives on regional development. Finally, the authors compare federalism, Chinese style, to federalism, Russian style.

In a second and related paper, these authors use a panel dataset to investigate the central-provincial relationship during China's reform. Here the two major empirical findings are: first, greater fiscal decentralization and stronger fiscal incentives — the latter measured in terms of higher (ex ante) provincial marginal revenue retention rate — imply faster development of non-state enterprises and more reform in state-owned enterprises in the province. Second, the political control of the central government, through the Communist Party, over provincial officials' appointment has the opposite effect, but does restrict the provincial government's excess investment. It is not as effective in curbing excess credit expansion, also a concern of the central government at the time.

Li presents statistical evidence of the pervasiveness of official diversion in China's industrial planning bureaucracy under the dual-track system. The underpricing of in-plan goods and their ensuing shortage has led to gains from trade between officials who controlled the allocation of in-plan goods and customers willing to pay more than the plan prices. By diverting goods from the plan and reselling them at higher market prices, this corruption creates leaks in the plan. Using data from a survey of state-owned manufacturers supplemented by aggregate input-output data, Li finds that the leakage in the plan, which measures the size of official diversion, became statistically detectable after the introduction of the dual-track system in 1985 and increased sharply in the late 1980s. Estimates show that approximately one-third of all in-plan industrial output was diverted between 1987 and 1989.

*

Bureau Books

The following two volumes may be ordered from the MIT Press, c/o Triliteral, 100 Maple Ridge Drive, Cumberland, RI 02864. To order by phone: TOLL FREE in the US and Canada: 1-800-405-1619 (9 am - 5 pm EST/EDT) or 401-658-4226. To order by Fax: TOLL FREE in the US and Canada: 1-800-406-9145 or 401-531-2801. To order by e-mail: mitpress-orders@mit.edu

Tax Policy and the Economy, Volume 17

Tax Policy and the Economy, Volume 17, edited by James M. Poterba, is available from the MIT Press for $25.00 in paperback and $58.00 clothbound. This NBER series presents current NBER research in the areas of taxation and government spending. Volume 17 continues the series' tradition of addressing topics that are of current relevance as well as longer-range concerns. The topics covered include the fiscal implications of the No Child Left Behind Act, the 2001 Tax Rebate, and the tax burdens of multinational corporations.

Poterba directs the NBER's Program on Public Economics and is the Mitsui Professor of Economics and the Associate Head of the Economics Department at MIT.

NBER Macroeconomics Annual 2002

NBER Macroeconomics Annual 2002, edited by Mark Gertler and Kenneth S. Rogoff, is available from the MIT Press for $32.00 in paperback and $65.00 clothbound. The NBER Macroeconomics Annual presents, extends, and applies pioneering work in macroeconomics and stimulates work by macroeconomists on important policy issues. Each paper in the Annual is followed by comments and discussion.

This volume includes papers on: rules versus discretion in monetary policy; productivity growth in the current century; an examination of whether the business cycle has changed; and a discussion of optimal currency areas.

Gertler and Rogoff are NBER Research Associates in the Programs on Monetary Economics and International Finance and Macroeconomics, respectively. Gertler is a professor of economics at New York University; Rogoff is a professor of economics at Harvard University.

Structural Impediments to Growth in Japan

Structural Impediments to Growth in Japan, edited by Magnus Blomström, Jennifer Corbett, Fumio Hayashi, and Anil K Kashyap, is available this fall from the University of Chicago Press for $70.00.

As the much-lauded "miracle" of Japan's stunning economic growth has given way to economic stagnation, analysts have focused their attention on the underlying systems that present obstacles to continued success. In a first book-length academic treatment of this important issue, a team of notable editors and contributors gathers to present nine papers offering a comprehensive assessment of those economic difficulties. The topics covered range from financial problems to corporate issues to issues in government policy. The result is an invaluable collection of information on the key challenges facing continued economic growth.

All of the volume's editors are members of the NBER's Japan Project. Blomström is a professor at the European Institute of Japanese Studies and the Stockholm School of Economics. Corbett is a reader at the University of Oxford and professor at Australian National University. Hayashi is a professor in the faculty of economics at the University of Tokyo. Kashyap is the Edward Eagle Brown Professor of Economics and Finance in the Graduate School of Business at the University of Chicago.

To order from the University of Chicago Press, write to Chicago Distribution Center, 11030 South Langley, Chicago, IL 60628. Or telephone: 1-800-621-2736 (from the U.S. and Canada); or (773) 568-1550 (from the rest of the world). Email orders to: custserv@press.uchicago.edu.

Current Working Papers

NBER Working Papers On-Line

A complete list of all NBER Working Papers with searchable abstracts, and the full texts of Working Papers (issued since November 1994) are available at **http://www.nber.org/wwp.html** to anyone located at a university or other organization that subscribes to the (hard copy) Working Paper series.

If you believe that your organization subscribes, but you cannot access the online Working Paper service, please e-mail the NBER at **wwp@nber.org** for more information and assistance.

*

Individual copies of NBER Working Papers, Historical Factors in Long-Run Growth Papers, and Technical Papers are available free of charge to Corporate Associates. **For all others, there is a charge of $10.00 per hardcopy or $5.00 per downloaded paper. (Outside the United States, add $10.00 per order for postage and handling.) Advance payment is required on all orders**. To order, call the Publications Department at (617)868-3900 or visit **www.nber.org/papers**. Please have ready the number(s) of any Working Paper(s) you wish to order.

Subscriptions to the full NBER Working Paper series include all 500 or more papers published each year. Subscriptions are free to Corporate Associates. For others within the United States, the standard rate for a full subscription is $2200; for academic libraries and faculty members, $1275. Higher rates apply for foreign orders. The on-line standard rate for a full subscription is $1560 and the on-line academic rate is $630. **Partial Working Paper subscriptions**, delineated by program, are also available.

For further information, see our Web site, or please write: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

*

Titles of all papers issued since July 2003 are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

NBER Working Papers

Paper	Author(s)	Title
9810	Youngjae Lim Chin Hee Hahn	Bankruptcy Policy Reform and Total Factor Productivity Dynamics in Korea: Evidence from Micro Data
9811	Joseph G. Altonji Ernesto Vilanueva	The Marginal Propensity to Spend on Adult Children
9812	Jonathan Meer Harvey S. Rosen	Insurance and the Utilization of Medical Services
9813	Lucian Arye Bebchuk Jesse M. Fried	Executive Compensation as an Agency Problem
9814	Alan J. Auerbach Maurice Obstfeld	The Case for Open-Market Purchases in a Liquidity Trap
9815	Douglas A. Irwin	Causing Problems? The WTO Review of Causation and Injury Attribution in U.S. Section 201 Cases
9816	Paul Gompers Josh Lerner David Scharfstein	Entrepreneurial Spawning: Public Corporations and the Genesis of New Ventures, 1986-1999
9817	Sebastian Edwards Javier Gomez Biscarri Fernando Perez de Gracia	Stock Market Cycles, Financial Liberalization, and Volatility

Paper	Author(s)	Title
9818	James J. Heckman Jeffrey A. Smith	The Determinants of Participation in a Social Program: Evidence from a Prototypical Job Program
9819	Lawrence J. Christiano Martin Eichenbaum Robert Vigfusson	What Happens After a Technology Shock?
9820	Sebastian Edwards I. Igal Magendzo	Strict Dollarization and Economic Performance: An Empirical Investigation
9821	Anne C. Case Angus Deaton	Broken Down by Work and Sex: How our Health Declines
9822	Angus Deaton	Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)
9823	Brian R. Copeland M. Scott Taylor	Trade, Growth, and the Environment
9824	H. Naci Mocan Erdal Tekin	Guns, Drugs, and Juvenile Crime: Evidence from a Panel of Siblings and Twins
9825	Michael R. Darby Lynne G. Zucker	Grilechesian Breakthroughs: Inventions of Methods of Inventing and Firm Entry in Nanotechnology
9826	Helen Levy Thomas DeLeire	What Do People Buy when they Don't Buy Health Insurance and What Does that Say about why they are Uninsured?
9827	William H. Dow Kristine A. Gonzalez Luis Rosero-Bixby	Aggregation and Insurance-Mortality Estimation
9828	Guillermo A. Calvo Alejandro Izquierdo Ernesto Talvi	Sudden Stops, the Real Exchange Rate, and Fiscal Sustainability: Argentina's Lessons
9829	Jean Boivin Serena Ng	Are More Data Always Better for Factor Analysis?
9830	Orazio Attanasio Pinelopi Attanasio Nina Pavcnik	Trade Reforms and Wage Inequality in Colombia
9831	Ted Joyce Andrew Racine	Chip Shots: Association Between the State Children's Health Insurance Programs and Immunization Coverage and Delivery
9832	Robert Barsky Christopher L. House Miles Kimball	Do Flexible Durable Goods Prices Undermine Sticky Price Models?
9833	Michael Kremer Christopher M. Snyder	Why Are Drugs More Profitable Than Vaccines?
9834	Anna Pavlova Roberto Rigobon	Asset Prices and Exchange Rates
9835	Claudio Raddatz Roberto Rigobon	Monetary Policy and Sectoral Shocks: Did the Fed React properly to the High-Tech Crisis?
9836	Ken Hendricks Robert Porter Guofu Tan	Bidding Rings and the Winner's Curse: The Case of the Federal Offshore Oil and Gas Lease Auctions
9837	Bennett T. McCallum	Multiple-Solution Indeterminancies in Monetary Policy Analysis

Paper	Author(s)	Title
9838	Bennett T. McCallum	Monetary Policy in Economies with little or no Money
9839	Laurent Calvet Adlai Fisher	Regime-Switching and the Estimation of Multifractal Processes
9840	Laurent Calvet Martín Gonzalez-Eiras Paolo-Sodoni	Financial Innovation, Market Participation, and Asset Prices
9841	Michael D. Bordo Christopher Meissner Angela Redish	How "Original Sin" was Overcome: The Evolution of External Debt Denominated in Domestic Currencies in the United States and the British Dominions, 1800-2000.
9842	Louis Kaplow	Public Goods and the Distribution of Income
9843	David F. Bradford	Addressing the Transfer-Pricing Problem in an Origin-Basis X Tax
9844	Michael Greenstone Enrico Moretti	Bidding for Industrial Plants: Does Winning a "Million Dollar Plant" Increase Welfare?
9845	Kent Smetters	Is the Social Security Trust Fund Worth Anything?
9846	William Easterly Ross Levine David Roodman	New Data, New Doubts: A Comment on Burnside and Dollar's "Aid Policies, and Growth" (2000)
9847	Michael Chernew Gautam Gowrisankaran Catherine McLaughlin Teresa Gibson	Quality and Employers' Choice of Health Plan
9848	Martin Lettau Sydney Ludvigson	Understanding Trend and Cycle in Asset Values: Reevaluating the Wealth Effect on Consumption
9849	Robert Gibbons Michael Waldman	Enriching a Theory of Wage and Promotion Dynamics inside Firms
9850	Claudio E. Montenegro Carmen Pages	Who Benefits from Labor Market Regulations? Chile, 1960-1998
9851	David Neumark Elizabeth T. Powers	The Effects of Changes in State SSI Supplements on Pre-Retirement Labor Supply
9852	Louis Kaplow	The Value of a Statistical Life and the Coefficient of Relative Risk Aversion
9853	Daniel S. Hamermesh Amy M. Parker	Beauty in the Classroom: Professors' Pulchritude and Putative Pedagogical Productivity
9854	Paul W. Rhode	After the War Boom: Reconversion on the U.S. Pacific Coast, 1943-49
9855	Michael Smart Mark Stabile	Tax Credits and the Use of Medical Care
9856	David W. Galenson	Literary Life Cycles: The Careers of Modern American Poets
9857	Joshua L. Rosenbloom William A. Sundstrom	The Decline and Rise of Interstate Migration in the United States: Evidence from the IPUMS, 1850-1990
9858	Lubos Pastor Pietro Veronesi	Stock Prices and IPO Waves
9859	James H. Stock Mark W. Watson	Understanding Changes in International Business Cycle Dynamics
9860	Michael D. Bordo Pierre-Cyrille Hautcoeur	Why didn't France Follow the British Stabilization after World War One?

Paper	Author(s)	Title
9861	Martin B. Haugh Leonid Kogan Jiang Wang	Evaluating Portfolio Policies: A Duality Approach
9862	Stephanie Schmitt-Grohe Martin Uribe	Anticipated Ramsey Reforms and the Uniform Taxation Principle: the Role of International Financial Markets
9863	Jay Bhattacharya Dana Goldman Neeraj Sood	Market Evidence of Misperceived Prices and Mistaken Mortality Risks
9864	Guillermo A. Calvo	Explaining Sudden Stops, Growth Collapse, and BOP Crises: The Case of Distortionary Output Taxes
9865	Elsa V. Artadi Xavier Sala-i-Martin	The Economic Tragedy of the 20th Century: Growth in Africa
9866	Christina D. Romer David H. Romer	A New Measure of Monetary Shocks: Derivation and Implications
9867	Sebastian Edwards Eduardo Levy Yeyati	Flexible Exchange Rates as Shock Absorbers
9868	Chiaki Moriguchi	Did American Welfare Capitalists Breach their Implicit Contracts? Preliminary Findings from Company-Level Data, 1920-1940
9869	Peter H. Lindert	Why the Welfare State Looks Like a Free Lunch
9870	Robert W. Fogel Chulhee Lee	Who Gets Health Care?
9871	Leemore S. Dafny	Entry Deterrence in Hospital Procedure Markets: A Simple Model of Learning-By-Doing
9872	Kevin H. O'Rourke	Heckscher-Ohlin Theory and Individual Attitudes Towards Globalization
9873	Marianne Bertrand Sendhil Mullainathan	Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination
9874	Patricia M. Danzon Y. Richard Wang Liang Wang	The Impact of Price Regulation on the Launch Delay of New Drugs — Evidence from Twenty-Five Major Markets in the 1990s
9875	Kathryn M. E. Dominguez	When Do Central Bank Interventions Influence Intra-Daily and Longer-Term Exchange Rate Movements?
9876	Michael Kremer Dan M. Levy	Peer Effects and Alcohol Use Among College Students
9877	James J. Heckman Xuesong Li	Selection Bias, Comparative Advantage, and Heterogeneous Returns to Education: Evidence from China in 2000
9878	Donald Boyd Hamilton Lankford Susanna Loeb James Wyckoff	Analyzing the Determinants of the Matching of Public School Teachers to Jobs: Estimating Compensating Differentials in Imperfect Labor Markets
9879	Rana Hasan Devashish Mitra K.V. Ramaswamy	Trade Reforms, Labor Regulations, and Labor-Demand Elasticities: Empirical Evidence from India
9880	Robert P. Flood Andrew K. Rose	Financial Integration: A New Methodology and an Illustration

Paper	Author(s)	Title
9881	Karsten Hansen James J. Heckman Kathleen J. Mullen	The Effects of Schooling and Ability on Achievement Test Scores
9882	Rafael La Porta Florencio Lopez-de-Silanes Andrei Shleifer	What Works in Securities Laws?
9883	Elizabeth W. Croft Barbara J. Spencer	Fees and Surcharging in Automatic Teller Machine Networks: Non-Bank ATM Providers versus Large Banks
9884	Athanasios Orphanides John C. Williams	Imperfect Knowledge, Inflation Expectations, and Monetary Policy
9885	Geoffrey Heal Howard Kunreuther	You Only Die Once: Managing Discrete Interdependent Risks
9886	Edward L. Glaeser Janet E. Kohlhase	Cities, Regions, and the Decline of Transport Costs
9887	Brian J. Hall	Six Challenges in Designing Equity-Based Pay
9888	Bradley Herring Mark Pauly	Incentive-Compatible Guaranteed Renewable Health Insurance
9889	Patrick Bajari Ali Hortacsu	Are Structural Estimates of Auction Models Reasonable? Evidence from Experimental Data
9890	Asli Demirguc-Kunt Luc Laeven Ross Levine	Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation
9891	Patrick Bajari Matthew E. Kahn	Estimating Housing Demand with an Application to Explaining Racial Segregation in Cities
9892	James Poterba Joshua Rauh Steven Venti David Wise	Utility Evaluation of Risk in Retirement Saving Accounts
9893	H. Henry Cao Richard K. Lyons Martin D. D. Evans	Inventory Information
9894	Patric H. Hendershott Bryan D. MacGregor	Investor Rationality: Evidence from UK Property Capitalization Rates
9895	James J. Heckman Rosa Matzkin Lars Nesheim	Simulation and Estimation of Nonadditive Hedonic Models
9896	Richard B. Freeman	What, Me Vote?
9897	Florian Heiss Michael Hurd Axel Börsch-Supan	Healthy, Wealthy, and Knowing Where to Live: Trajectories of Health, Wealth, and Living Arrangements Among the Oldest Old
9898	Ricardo J. Caballero Eduardo M.R.A. Engel	Adjustment is much Slower than you Think
9899	Eiichi Tomiura	Changing Geography and Vertical Linkages in Japan
9900	Paul R. Bergin Ivan Tchakarov	Does Exchange Rate Risk Matter for Welfare?

Paper	Author(s)	Title
9901	Dalton Conley Kate Strully Neil G. Bennett	A Pound of Flesh or Just Proxy? Using Twin Differences to Estimate the Effect of Birth Weight on Life Chances
9902	Axel Börsch-Supan Lothar Essig	Household Saving in Germany: Results of the First SAVE Study
9903	Stephen M. Maurer Suzanne Scotchmer	Procuring Knowledge
9904	David Austen-Smith Roland G. Fryer, Jr.	The Economics of "Acting White"
9905	Pierpaolo Benigno Michael Woodford	Optimal Monetary and Fiscal Policy: A Linear-Quadratic Approach
9906	Joshua Aizenman	On the Hidden Links Between Financial and Trade Opening
9907	Anna Aizer Jeffrey Grogger	Parental Medicaid Expansions and Health Insurance Coverage
9908	Carmen M. Reinhart Kenneth S. Rogoff Miguel A. Savastano	Debt Intolerance
9909	Petra Moser	How do Patent Laws Influence Innovation? Evidence from Nineteenth-Century World Fairs
9910	Ivar Ekeland James J. Heckman Lars P. Nesheim	Identification and Estimation of Hedonic Models
9911	Kevin Lang Sumon Majumdar	The Pricing of Job Characteristics when Markets do not Clear: Theory and Policy Implications
9912	Stephen T. Parente David Salkever Joan DaVanzo	The Role of Consumer Knowledge of Insurance Benefits in the Demand for Preventative Health
9913	Axel Börsch-Supan Barbara Berkel	Pension Reform in Germany: The Impact on Retirement Decisions
9914	Alessandro Beber Michael W. Brandt	The Effect of Macroeconomic News on Beliefs and Preferences: Evidence from the Options Market
9915	Yacine Aït-Sahalia	Disentangling Volatility from Jumps
9916	Casey B. Mulligan	Capital Tax Incidence: Fisherian Impression from the Time Series
9917	James Choi David Laibson Brigitte Madrian Andrew Metrick	Passive Decisions and Potent Defaults
9918	Hope Corman Nancy E. Reichman Kelly Noonan	Mothers' and Fathers' Labor Supply in Fragile Families: The Role of Child Health
9919	Mark V. Pauly Yuhui Zeng	Adverse Selection and the Challenges to Stand-Alone Prescription Drug Insurance
9920	Kyle Bagwell Petros C. Mavroidis Robert W. Staiger	The Case for Auctioning Countermeasures in the WTO

Paper	Author(s)	Title
9921	Thorsten Beck Asli Demirguc-Kunt Ross Levine	Bank Concentration and Crises
9922	Severin Borenstein Stephen P. Holland	On the Efficiency of Competitive Electricity Markets With Time-Invariant Retail Prices
9923	Jeremy Atack Fred Bateman Robert A. Margo	Capital Deepening in American Manufacturing, 1850-1880
9924	Jason G. Cummins	A New Approach to the Valuation of Intangible Capital
9925	Mark V. Pauly Kate H. Withers Krupa Subramanian-Viswanathan Jean Lemaire John C. Hershey Katrina Armstrong David A. Asch	Price Elasticity of Demand for Term Life Insurance and Adverse Selection
9926	Jeff Dominitz Charles F. Manski	How Should We Measure Consumer Confidence (Sentiment)? Evidence from the Michigan Survey of Consumers
9927	Hui Guo Robert F. Whitelaw	Uncovering the Risk-Return Relation in the Stock Market
9928	Francesco Caselli Daniel Wilson	Importing Technology
9929	Robert G. King Alexander L. Wolman	Monetary Discretion, Pricing Complementarity, and Dynamic Multiple Equilibria
9930	Michael Faulkender Mitchell Petersen	Does the Source of Capital Affect Capital Structure?
9931	Gilles Duranton Diego Puga	Micro-Foundations of Urban Agglomeration Economies
9932	Andres Velasco Alejandro Neut	Tough Policies, Incredible Policies?
9933	Dora L. Costa Joanna Lahey	Becoming Oldest-Old: Evidence from Historical U.S. Data
9934	Daron Acemoglu Simon Johnson	Unbundling Institutions
9935	David W. Galenson	The Reappearing Masterpiece: Ranking American Artists and Art Works of the Late Twentieth Century
9936	Tibor Besedes Thomas J. Prusa	On the Duration of Trade
9937	Sean Nicholson M. Kate Bundorf Rebecca M. Stein Daniel Polsky	The Magnitude and Nature of Risk Selection in Employer-Sponsored Health Plans
9938	Roland G. Fryer Steven D. Levitt	The Causes and Consequences of Distinctively Black Names
9939	Marc P. Giannoni Michael Woodford	Optimal Inflation Targeting Rules

Paper	Author(s)	Title
9940	Christopher Blattman Jason Hwang Periphery Jeffrey G. Williamson	The Terms of Trade and Economic Growth in the Periphery, 1870-1938
9941	Robert W. Fogel	Changes in the Process of Aging during the Twentieth Century: Findings and Procedures of the Early Indicators Project
9942	Joel Waldfogel Lu Chen	Does Information Undermine Brand? Information Intermediary Use and Preference for Branded Web Retailers
9943	Douglas A. Irwin	The Aftermath of Hamilton's "Report on Manufactures"
9944	Douglas A. Irwin Joseph H. Davis	Trade Disruptions and America's Early Industrialization
9945	Pol Antras	Incomplete Contracts and the Product Cycle
9946	Robert G. King Julia K. Thomas	Partial Adjustment without Apology
9947	Erkan Erdem James Tybout	Trade Policy and Industrial Sector Responses: Using Evolutionary Models to Interpret the Evidence
9948	Nelson Mark Young-Kyu Moh	Official Interventions and Occasional Violations of Uncovered Interest Parity in the Dollar-DM Market
9949	Eric Friedman Simon Johnson Todd Mitton	Propping and Tunneling
9950	Ajay Agrawal Iain M. Cockburn John McHale	Gone but not Forgotten: Labor Flows, Knowledge Spillovers, and Enduring Social Capital
9951	Sheridan Titman K.C. John Wei Feixue Xie	Capital Investments and Stock Returns
9952	Alison Evans Cuellar Sara Markowitz Anne M. Libby	The Relationship between Mental Health and Substance Abuse Treatment and Juvenile Crime
9953	Donald Boyd Hamilton Lankford Susanna Loeb James Wyckoff	The Draw of Home: How Teachers' Preferences for Proximity Disadvantage Urban Schools
9954	Susanna Loeb Bruce Fuller Sharon Lynn Kagan Bidemi Carrol Judith Carroll Jan McCarthy	Child Care in Poor Communities: Early Learning Effects of Type, Quality, and Stability
9955	Daniel Kessler Mark B. McClellan	Advance Directives and Medical Treatment at the End of Life
9956	Evan Gatev Philip E. Strahan	Banks' Advantage in Hedging Liquidity Risk: Theory and Evidence from the Commercial Paper Market
9957	Amy Finkelstein Kathleen McGarry	Private Information and its Effect on Market Equilibrium: New Evidence from Long-Term Care Insurance
9958	Claudia Goldin Lawrence F. Katz	The "Virtues" of the Past: Education in the First Hundred Years of the New Republic

Paper	Author(s)	Title
9959	Hanno Lustig Stijn Van Nieuwerburgh	Housing Collateral, Consumption Insurance, and Risk Premia: An Empirical Perspective
9960	Bennett T. McCallum	The Unique Minimum State Variable RE Solution is E-Stable in all Well Formulated Linear Models
9961	Bennett T. McCallum	Is the Fiscal Theory of the Price Level Learnable?
9962	Howard Bodenhorn Christopher S. Ruebeck	The Economics of Identity and the Endogeneity of Race
9963	Rosalie Liccardo Pacula Karen E. Ross Jeanne Ringel	Does Marijuana Use Impair Human Capital Formation?
9964	Jorn-Steffen Pischke	The Impact of Length of the School Year on Student Performance and Earnings: Evidence from the German Short School Year
9965	Alvin J. Silk Ernst R. Berndt	Scale and Scope Economies in the Global Advertising and Marketing Services Business
9966	Jaison R. Abel Ernst R. Berndt Alan G. White	Price Indexes for Microsoft's Personal Computer Software Products
9967	Robert E. Hall	Wage Determination and Employment Fluctuations
9968	Gauti B. Eggertsson Michael Woodford	Optimal Monetary Policy in a Liquidity Trap
9969	Martin Feldstein	Monetary Policy in an Uncertain Environment
9970	Gadi Barlevy	The Cost of Business Cycles under Endogenous Growth
9971	Michael P. Dooley David Folkerts-Landau Peter Garber	An Essay on the Revised Bretton Woods System
9972	Leemore S. Dafny	How Do Hospitals Respond to Price Changes?
9973	David G. Blanchflower Alex Bryson	What Effect do Unions Have on Wages now and Would "What Do Unions Do" Be Surprised?
9974	Jonathan Lewellen Stefan Nagel	The Conditional CAPM does not Explain Asset-Pricing Anomalies
9975	David McCarthy Olivia S. Mitchell	International Adverse Selection in Life Insurance and Annuities
9976	Melvin Stephens Jr.	The Consumption Response to Predictable Changes in Discretionary Income: Evidence from the Repayment of Vehicle Loans
9977	Susan Averett Howard Bodenhorn Justas Staisiunas	Unemployment Risk and Compensating Differential in Late-Nineteenth Century New Jersey Manufacturing
9978	David Popp	Lessons From Patents: Using Patents to Measure Technological Change in Environmental Models
9979	Chris Forman Avi Goldfarb Shane Greenstein	How did Location Affect Adoption of the Commercial Internet? Global Village, Urban Density, and Industry Composition
9980	C. Lanier Benkard Patrick Bajari	Hedonic Price Indexes with Unobserved Product Characteristics, and Application to PC's
9981	Marvin Goodfriend	Inflation Targeting in the United States?

Paper	Author(s)	Title
9982	Alessandra Casella Andrew Gelman Thomas R. Palfrey	An Experimental Study of Storable Votes
9983	Alan J. Auerbach Young Jun Chun	Generational Accounting in Korea
9984	Ignazio Angeloni Anil K. Kashyap Benoit Mojon Daniele Terlizzese	Monetary Transmission in the Euro Area: Does the Interest Rate Channel Explain All?
9985	Ignazio Angeloni Anil K. Kashyap Benoit Mojon Daniele Terlizzese	The Output Composition Puzzle: A Difference in the Monetary Transmission Mechanism in the Euro Area and U.S.
9986	Peter C. Reiss Matthew W. White	Demand and Pricing in Electricity Markets: Evidence from San Diego during California's Energy Crisis
9987	Ann Bartel Richard Freeman Casey Ichniowski Morris M. Kleiner	Can a Work Organization Have an Attitude Problem? The Impact of Workplaces on Employee Attitudes and Economic Outcomes
9988	Raj Chetty	A New Method of Estimating Risk Aversion
9989	Stanley L. Engerman Kenneth L. Sokoloff	Institutional and Non-Institutional Explanations of Economic Differences
9990	Rebecca Menes	Corruption in Cities: Graft and Politics in American Cities at the Turn of the Twentieth Century
9991	Jerry G. Thursby Marie C. Thursby	Are Faculty Critical? Their Role in University-Industry Licensing
9992	Richard B. Freeman	What Do Unions Do ... to Voting?
9993	Dirk Krueger Fabrizio Perri	On the Welfare Consequences of the Increase in Inequality in the United States
9994	Jonathan Klick Sara Markowitz	Are Mental Health Insurance Mandates Effective? Evidence from Suicides
9995	Malcolm Baker Jeffrey Wurgler	Appearing and Disappearing Dividends: The Link to Catering Incentives
9996	M. Kate Bundorf	The Effects of Offering Health Plan Choice within Employment-Based Purchasing
9997	Nicholas Barberis Ming Huang Richard Thaler	Individual Preferences, Monetary Gambles, and the Equity Premium
9998	Andrew B. Bernard Stephen Redding Peter K. Schott Helen Simpson	Relative Wage Variation and Industry Location
9999	Leora Friedberg Anthony Webb	Retirement and the Evolution of Pensions Structure
10000	Richard B. Freeman	Trade Wars: The Exaggerated Impact of Trade in Economic Debate
10001	Dirk Krueger Krishna B. Kumar	US-Europe Differences in Technology-Driven Growth: Quantifying the Role of Education

Paper	Author(s)	Title
10002	Alvin E. Roth M. Utku Unver Tayfun Sonmez	Kidney Exchange
10003	Diego Comin Mark Gertler	Medium Term Business Cycles
10004	Eli Berman	Hamas, Taliban, and the Jewish Underground: An Economist's View of Radical Religious Militias
10005	Louis Kaplow	Concavity of Utility, Concavity of Welfare, and Redistribution of Income

*

NBER *Reporter*

NATIONAL BUREAU OF ECONOMIC RESEARCH

1050 Massachusetts Avenue
Cambridge, Massachusetts 02138-5398
(617) 868-3900

Change Service Requested

Nonprofit Org.
U.S. Postage
PAID
National Bureau of
Economic Research