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Program Report

Economic Fluctuations and Growth

Robert E. Hall*

The U.S. economy has enjoyed uninterrupted growth since the trough of the last recession in the spring of 1991. As unemployment has declined to just over 5 percent, attention has turned increasingly to issues of longer-run macroeconomic performance. Now, the topics of economic fluctuations and growth also are combined in a single NBER program, since the economic fluctuations program has taken over the functions of the earlier growth project (officially becoming the Program in Economic Fluctuations and Growth in early 1996). This continues to be the largest of the Bureau's research programs, with roughly 60 research associates and 25 faculty research fellows.

Many of the research activities of the "EFG program" take place in small groups working on specific topics. These groups are open, and some group members do not have formal affiliations with the NBER. The small groups' work is described in some detail later in this report. Almost all of these groups also meet in Cambridge in July as part of the Bureau's Summer Institute. At that time, the entire program also meets to present and discuss six academic research papers. The small groups meet during the academic year on their own, or in conjunction with other NBER program meetings, as well. Finally, the EFG program is responsible for the NBER's Annual Conference on Macroeconomics, which takes place in Cambridge each March.

The 1995 Nobel Prize in Economics

Robert E. Lucas, Jr. of the University of Chicago, an active member of the EF program since its inception in 1978, won the 1995 Nobel Memorial Prize in Economics. The prize was announced shortly before the pro-

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gram's research meeting in October 1995, after Lucas had agreed to serve as a discussant at the meeting; this happy event was acknowledged in a suitable way at lunch. Also, program member Stanley Fischer and I were asked by the *Scandinavian Journal of Economics* to prepare papers summarizing Lucas's many contributions.[1]

Program Members in Washington

Members of the EFG program have held a number of important policymaking and advisory positions in Washington. For example, John B. Taylor of Stanford University served as a member of the Council of Economic Advisers under George Bush, and Martin Neil Baily was a council member under President Clinton. Joseph E. Stiglitz currently serves as chairman of the Council of Economic Advisers; Lawrence H. Summers is deputy secretary of the U.S. Treasury, and Alan S. Blinder of Princeton University served until recently as vice-chairman of the Federal Reserve Board of Governors.

Business Cycle Dating

Traditionally, the Business Cycle Dating Committee has been the most conspicuous public element of the EFG program. The committee last met in 1992 to determine the date of the end of the recession of 1990–1. With the nonstop growth of the economy since that meeting, the committee has not met again; it will not meet until well after the economy reaches a peak of activity and begins a new recession. At this writing, there is no sign of impending recession, and the experimental recession probability index prepared by program members James H. Stock of Harvard University and Mark W. Watson of Princeton University assigns a low probability to a recession in the near future.

Macroeconomics Annual

Under the leadership of program members Ben S. Bernanke of Princeton University and Julio J. Rotemberg of MIT, the EFG program organizes a major conference on macroeconomics each year. The proceedings appear in the *NBER Macroeconomics Annual,* published by the MIT Press. The organizers choose authors from among those who have recently developed important new lines of research in macroeconomics; the format of the conference and volume permits a fuller expression and integration of the research than is possible in major economics journals, in which the line of research usually has been exposed already. The emphasis of the *Annual* is on basic quantitative research with potential policy applications.

Small Research Groups

Growth[2]

The first meeting of the newly formed "Growth Group" focused on the accumulation and development of human capital, finding some surprisingly paradoxical results and developing exciting avenues for future research. Lant Pritchett of the World Bank presented cross-sectional evidence that the growth of human capital, as measured by years of education, is completely uncorrelated with the growth of output. This result is surprisingly robust to the use of different datasets, as confirmed by conference participant Jong-Wha Lee, NBER and Korea University, who, together with Robert J. Barro, NBER and Harvard University, has developed a broad international database on education.

The conventional measure of human capital, the years that students devote to education, is extraordinarily crude, providing inadequate assessment of the value and growth of human capital. Dale W. Jorgenson of Harvard University presents new estimates of the value of the output of the U.S. educational sector. Jorgenson places the valuation of human capital on an equal footing with the valuation of physical capital by using lifetime earnings profiles to estimate the net present value of the additional earnings induced by an additional year of education. Gary S. Becker and NBER Research Associate Kevin M. Murphy, both of the University of Chicago, pushed the discussion further, showing how differences in the earnings of U.S. workers by country of origin could be used to infer differences in the value of their educational attainment and, by extension, to develop deflators for the nominal output of the educational sector. The application of these methods to broader international comparisons appears to be an essential first step in unraveling the puzzle posed by Pritchett and others.

Income Distribution and Macroeconomics[3]

This group has concentrated on three broad topics of significant importance to the U.S. economy. First, researchers have identified four channels through which income distribution affects growth and macroeconomic activity. Inequality, in the presence of imperfections in capital markets, may affect investment in human and physical capital adversely and therefore may reduce output and economic growth. These macroeconomic affects may be magnified by the sorting of individuals into homogeneous communities. Second, inequality may generate conflict that diminishes the security of property rights, hence lowering investment and economic growth. Third, inequality may have an adverse effect on investment in human capital, and therefore may increase fertility and slow economic growth. Fourth, inequality generates pressure for distortionary redistribution, adversely affecting investment and growth.

The first three mechanisms receive significant support from cross-country evidence, whereas the fourth is refuted. Studies carried out in the group shed new light on the potential macroeconomic implications of inequality in general, and of the recent rise in inequality in the United States in particular.

Next, several researchers in this group have examined the interaction among technological progress, intergenerational earnings mobility, and economic growth. For example, they have identified mechanisms through which technological progress determines earnings mobility and income distribution; conversely, they show how earnings mobility and income distribution affect the pace of technological progress and output growth. Major technological breakthroughs increase social mobility and income inequality and initially lower the pace of future economic growth. However, as technology becomes more accessible, mobility decreases, income inequality diminishes, and the pace of future economic growth accelerates. These studies enable us to assess the effect of the recent wave of technological progress, such as the computer revolution, on social and occupational mobility, wage and income inequality, and economic growth in the United States.

In a third area, researchers in this group have examined the implications of social institutions, such as education finance, fiscal policies, and labor market institutions, on macroeconomic performance and economic growth. Some have provided explanations for the differences in education finance and fiscal policies in the United States versus Europe and Japan. Others have examined the optimality of various forms of education finance, contrast-

ing public and private provision of education.

Macroeconomic Complementarities[4]

A complementarity exists when the activities of one person or firm have favorable effects on other people or firms. The topics that this group explores are standard in macroeconomics: the sources and consequences of economic fluctuations; economic growth; income distribution; the operation of labor markets; the demand for money; and the implications of government policies. In the presence of complementarities, though, there can be underemployment of resources and even the possibility of multiple equilibriums.

The idea of macro complementarities encompasses linkages across agents in an economy, so that higher activity in the economy generally induces higher activity by a single worker or firm. We may think of activity as broadly defined and including: hours worked; output produced; time spent searching; level of investment activity; and so forth. In general, these linkages can be global (that is, a single agent's choices influenced by the aggregate level of activity) or local (a single agent's choices influenced by a few neighbors).

Established research has provided examples of multiplicity through technological links across a group of agents. NBER researchers extend that formulation to the stochastic growth model with technological complementarities. Related models positing increasing returns in technology analyze the multiplicity of equilibriums and the instability in the process of financial intermediation. Models based upon these technological linkages also have been formulated to study the timing of economic decisions, stressing the possibility of equilibrium delay. Peter A. Diamond of MIT has developed a search model with multiple equilibriums that provides another source of multiplicity and is being used to study labor markets and the demand for money.

A common theme of this group's research is that the presence of complementarities creates a source for the magnification and propagation of shocks, as well as creating the possibility of multiple equilibriums. In addition, the models are inherently nonlinear, which creates an important connection between these economies and evidence of nonlinearities in the aggregate economy.

Initially, the group's effort focused on understanding the environments that give rise to complementarities. Its more recent work has explored the quantitative aspects of these economies. In particular, evidence on the sources of complementarities and results on their time-series and cross-sectional implications are a major component of the group's activities.

Micro and Macro Perspectives on the Aggregate Labor Market[5]

The premise underlying this group's work is that a better understanding of the various facets of the labor market is important for many questions in macroeconomics, including for example, accounting for cyclical fluctuations, the determinants of growth, and the role of labor market regulations in explaining cross-country differences in employment.

One important part of the group's research draws on the empirical work of NBER Research Associates Steven J. Davis of the University of Chicago and John C. Haltiwanger of the University of Maryland (as well as others) that documents the large flows of employment across establishments at all points over the business cycle. Standard macroeconomic models abstract from these flows. There are three related lines of research that stem from this original finding: 1) more extensive measurement, aimed at identifying the important regularities; 2) building models that account for the regularities; and 3) using the models to address relevant policy questions. The group has been engaged actively in all three of these lines of research.

This work also has important implications for policy. Many labor market programs—including unemployment insurance, job protection legislation, subsidies to job creation, and subsidies to declining industries—affect job creation and destruction. Through their effects on the incentives to create and destroy jobs, these policies have implications for aggregate employment, aggregate productivity, and unemployment dynamics. To illustrate, a recent paper[6] by Steven Millard of the Bank of England and Dale T. Mortensen of Northwestern University finds that differences in taxation, unemployment insurance, and job protection can explain differences in average unemployment, and in particular differences in unemployment duration and incidence, between the United States and United Kingdom over the last decade.

It is also of obvious interest to examine the effects of various policies on welfare. Fernando Alvarez, University of Chicago, and Marcelo Veracierto, Cornell University, assess the extent to which several policies that distort production decisions may have beneficial results for welfare because of insurance considerations that arise from incomplete markets.[7] One of their findings is that unemployment insurance has a larger impact on allocations than do sever-

ance payments, but that in both cases the net welfare effect of these policies is still negative.

Aggregate Implications of Microeconomic Consumption Behavior[8]

One of the lines of research conducted within this group is concerned with modeling the distribution of wealth and saving across households. Karen Dynan of the Federal Reserve Board, Jonathan S. Skinner, NBER and Dartmouth College, and Stephen P. Zeldes, NBER and Columbia University, have developed evidence that households with high levels of permanent labor income have high lifetime saving rates. Mark Huggett and Gustavo Ventura of the University of Illinois have examined whether such a positive correlation between saving and income could arise in a general equilibrium model in which households experience idiosyncratic shocks and face a progressive Social Security system. Their model explains a positive correlation between permanent labor income and saving, in part because the progressivity of the Social Security system means that low lifetime–income households have comparatively high income late in life, and therefore have no need to save for retirement.

One empirical problem for this model, and for most other saving models with heterogeneous agents and idiosyncratic shocks, is that they tend to underpredict the wealth-holding of the richest households. Two projects in the group examine whether the extreme concentration of wealth in the United states could be reproduced by relaxing the assumption that all consumers face the same budget opportunities. Vincenzio Quadrini of the University of Pennsylvania has developed a model in which households randomly receive entrepreneurial opportunities, and then choose to invest or not invest. Rios-Rull's model makes the rate of return a nonlinear function of the level of wealth, with wealthy consumers earning a higher rate of return. Both of these models are able to produce aggregate wealth distributions substantially similar to the empirical wealth distribution in the United States.

Another longstanding puzzle about wealthholding behavior in the United States is the small fraction of the household sector's financial wealth that is invested in risky assets. Michael C. Fratantoni of Johns Hopkins University has developed a model that shows that the combination of labor income risk and the risk associated with homeownership is large enough to induce consumers to hold any remaining assets mostly or entirely in riskless forms.

Two additional projects relate to the growing body of macroeconomic literature that has found that survey measures of consumer sentiment, and particularly measures of unemployment expectations, have substantial explanatory power for aggregate consumption growth. Nicholas Souleles of the University of Pennsylvania preliminarily finds that in household data as in the macroeconomic data, (lagged) consumer sentiment is correlated positively with current consumption growth. Carroll, Dynan, and Spencer D. Krane of the Federal Reserve Board have developed a theoretical model of the relationship between consumers' unemployment expectations and their wealthholdings. They present empirical evidence that, as the model predicts, households that face unusually high unemployment risk hold substantially more net worth than those with less risk.

Pinelopi K. Goldberg, NBER and Princeton University, and Attanasio examine a large survey of automobile purchasers to test the implications of the presence of liquidity constraints for the demand for loans. In particular, they find that the demand of groups who are more likely to be liquidity constrained, such as the young, is sensitive to the maturity of the loans and relatively insensitive to changes in the interest rate.

A final study, by Michael G. Palumbo, University of Houston, and coauthors, presents historical data from the late 19th century on saving patterns by U.S. workers. The authors find that, despite the enormous institutional changes over the past hundred years, saving behavior in that era appears to have been remarkably similar to current saving behavior.

Diversity of Agents and Specificity of Assets[9]

In macroeconomics, many advances have been made by assuming that people have similar preferences and that they own similar assets. But this group is exploring models that drop one or both of these assumptions. In these models, people and firms are quite different from one another, and place higher values on their assets than any potential buyer would.

In one example, Valerie A. Ramey, NBER and University of California, San Diego, and Matthew D. Shapiro, NBER and University of Michigan, are using the experience of a failed defense contractor to document the costs of adapting capital goods from one use to another. Olivier J. Blanchard and Michael Kremer, both of NBER and MIT, start from the premise that greater private opportunities made possible by reform in Eastern Europe may have been responsible for the costly breakdown of complex economic relationships. Mohamad L. Hammour of Columbia University and

Caballero are exploring the multiple macroeconomic consequences of unprotected asset specificity.[10]

A number of studies focus on search frictions and the allocation process. Daron Acemoglu of MIT is investigating the implications of search for income distribution, whereas Giuseppe Bertola, NBER and Università di Torino, and Pietro Garibaldi, Innocenzo Gasparini Institute for Economic Research, Milan, are considering the implications for the distribution of wages across different size firms. James S. Costain of the University of Chicago analyzes unemployment insurance in a general equilibrium model with precautionary savings. Harold Cole of the Federal Reserve Bank of Minneapolis and Rogerson are working on an explanation of the cyclical properties of job creation and job destruction based on a modified Diamond–Mortensen–Pissarides search model.

One natural way to model asset specificity is with irreversibility and fixed costs of adjustment. Janice C. Eberly, NBER and University of Pennsylvania, and John Shea, University of Maryland, test for differences in the degree of irreversibility among various types of investment. In order to understand durable goods cycles, Jerome Adda of the Institut Nationale de la Recherche Agronomique, and Cooper analyze the recent use of tax policy to stimulate auto demand in France. Christopher L. Foote of the University of Michigan shows that if there are costs to hiring and firing workers, the cyclicality of job creation and destruction within the sector may depend on whether a sector is growing or declining.

Finally, a number of studies analyze the relationship between frictions and information revelation. V. V. Chari, University of Minnesota, and Patrick J. Kehoe, NBER and University of Pennsylvania, model herding in foreign lending, and Christophe Chamley of Boston University studies the implications of information dynamics for business cycles.

Empirical Methods[11]

This group's concerns are primarily methodological, but its topics are firmly grounded in applications. The group develops econometric tools needed for identifying and addressing substantive issues in empirical macroeconomics. Its activities focus on characterizing and modeling business cycle dynamics, estimation, and inference in vector autoregressive models, and estimation of macroeconomic relationships and models. A common theme, running through many of the group's activities, is the development of methods for forecasting economic activity. Much of the group's recent research will be contained in a forthcoming special symposium "Forecasting and Empirical Methods in Macroeconomics," in the *International Economic Review*.

Dynamics of the Business Cycle

The salient questions in this area are of tremendous practical importance. For example: How and why do key variables move in parallel over the cycle? What methods are best for monitoring the cycle in real time and for quickly identifying business cycle turning points? What potential exists for forecasting the cycle, and the turning points in particular? How can we learn from our track record and modify our methods accordingly? The group is working on a variety of new methods and models that will help provide answers to these and other questions.

For example, Charles H. Whiteman of the University of Iowa is developing a Bayesian approach to the construction and estimation of a dynamic factor model of macroeconomic activity, from which he extracts an index of leading indicators. His method has been extremely successful in forecasting economic conditions and in generating state revenue forecasts in Iowa.

Bruce Hansen of Boston College is developing the statistical estimation theory for models that capture regime-switching behavior in the macroeconomy. He is exploring the applicability of such econometric techniques to macroeconomic models with multiple equilibriums.

Edward B. Montgomery, NBER and University of Maryland, Victor Zarnowitz, NBER and University of Chicago, and two coauthors assess the comparative forecasting performance of a variety of linear and nonlinear models of the U.S. unemployment rate. They find that combining standard linear forecasts with forecasts from models that allow for asymmetric behavior in the rise and decline of unemployment improves the accuracy of the forecasts.

Gabriel Perez-Quiros and Allan Timmermann of the University of California, San Diego, study the links between real macroeconomic activity and the stock market. In particular, they characterize the pattern and magnitude of business cycle variations in U.S stock returns. Using a new approach that precisely identifies the stage of the business cycle, they document patterns that cast doubt on standard asset-pricing models, but that nevertheless suggest promising directions for future research.

Estimation, Inference, and Forecasting in Vector Autoregressive (VAR) Models

VARs are now the dominant framework for empirical macroeconomic analysis and forecasting, but

existing methods provide only very crude guidance as to the uncertainty associated with VAR parameter estimates, impulse response estimates, and forecasts. Hence the group is focusing on key questions such as: Does imposing long-run restrictions on VAR forecasting models improve the accuracy of long-run forecasts? How can we accurately assess the uncertainty associated with parameter estimates and impulse-response estimates from VARs? How can we accurately assess the uncertainty associated with our forecasts, especially long-horizon forecasts?

Peter Christoffersen of the IMF and Diebold explore the effects of imposing cointegration on VARs. Imposing cointegration guarantees that long-horizon forecasts hang together in reasonable ways. Christoffersen and Diebold nevertheless show that, contrary to popular belief, imposing cointegration does not improve long-horizon forecasts when forecast accuracy is evaluated using standard measures. They conclude that the standard accuracy measures are deficient in an important respect, and they suggest alternatives.

Stock examines long–horizon point forecasts and prediction intervals when variables are nearly cointegrated. To do so, he uses asymptotic methods in which the forecast horizon is a fixed fraction of the sample size. Based on this notion he compares the standard approaches to long-horizon forecasting with several alternatives. He finds that standard point forecasts in VARs and vector error correction models tend to be biased, and the associated standard interval forecasts tend to have distorted coverage. The performance of the alternative methods is mixed.

Stock and Watson propose procedures for computing confidence intervals for parameters in VARs with highly persistent data, without making rigid assumptions about the nature of the persistence. They are applying their methods to obtaining improved estimates of the relationships among money, aggregate output, and interest rates.

Lutz Kilian of the University of Michigan analyzes the related problem of bias in VAR impulse response estimates, which play an important role in empirical macroeconomics. He proposes a bootstrap confidence interval designed to account for both the bias and the skewness in the impulse response distribution. He shows that this bootstrap interval is more accurate than alternative methods.

Christopher A. Sims, NBER and Yale University, and Tao Zha, Federal Reserve Bank of Atlanta, develop Bayesian methods for forecasting with VARs. They attempt to bridge the middle ground between traditional Bayesian reduced-form models and explicitly structural econometric models. Sims and Zha's main focus is on improving existing equation-by-equation estimation methods and on quantifying forecast uncertainty.

Estimation

Traditional instrumental-variable estimation remains an important tool in applied research. However, little is known about measuring instrument relevance. To aid in the selection of instruments, Shea proposes a new test for instrument relevance in multivariate linear models.

Generalized method of moments (GMM) estimation, another instrumental-variable technique, suffers from a lack of constructive diagnostic tests for assessing the adequacy of a fitted model. Fallaw Sowell of Carnegie–Mellon University proposes new tests for violations of moment conditions in the GMM framework. Unlike existing tests, Sowell's test has power against both parameter instability and violations of overidentifying restrictions.

Can we develop estimation methods for dynamic macroeconomic models that are better grounded in statistical theory than "calibration" techniques, yet structured enough to enable the incorporation of stochastic restrictions from economic theory? David DeJong, University of Pittsburgh, Beth Ingram, and Whiteman estimate the parameters of a neoclassical business cycle model using a fully Bayesian procedure. They also quantify the sources of business cycle fluctuations. Their procedure provides an alternative to the informal calibration exercises that are now prevalent in the macroeconomic literature.

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[1] *My paper begins, "Over the last thirty years, the theory and practice of economic dynamics has undergone an extraordinary transformation. Robert Lucas has been and continues to be the leader of this transformation. He has provided economists with new tools and new ways of thinking about dynamic problems. Moreover, in the process, he has provided new answers to many of the problems of greatest concern to macroeconomists. From investment to unemployment, economic growth to monetary policy, monetary theories of the business cycle to the income distribution, one can find a seminal and path-breaking analysis from Lucas."*

[2] *Led by Charles I. Jones, Stanford University, and Alwyn Young, NBER and Boston University.*

[3] *Led by Roland Benabou, NBER and New York University, Steven Durlauf, NBER and University of Wisconsin, and Oded Galor, Brown University.*

[4] *Led by Russell Cooper, NBER and Boston University.*

[5] *Led by Richard Rogerson, University of Minnesota, and Randall Wright, University of Pennsylvania.*

[6] *S. Millard and D. T. Mortenson, "The Unemployment and Welfare Effects of Labor Market Policy"*

[7] *F. Alvarez and M. Veracierto, "Welfare Effects of Job Security Provisions Under Imperfect Insurance Markets"*

[8]*Led by Orazio Attanasio, NBER and University College, London, Christopher D. Carroll, NBER and Johns Hopkins University, and José-Victor Rios-Rull, Federal Reserve Bank of Minneapolis.*

[9]*Led by Ricardo J. Caballero, NBER and MIT, Andrew Caplin, NBER and New York University, and John V. Leahy, NBER and Harvard University.*

[10]*R. J. Caballero and M. L. Hammour, "The Macroeconomics of Specificity," NBER Working Paper No. 5757, September 1996.*

[11]*Led by Francis X. Diebold, NBER and University of Pennsylvania, and Kenneth D. West, NBER and University of Wisconsin.*

Research Summaries

Heterogeneity in Schooling, Uncertainty, and the Return to Education

Joseph G. Altonji*

There is an enormous empirical literature on human capital and earnings that has grown out of work by Jacob Mincer, Gary Becker, and other pioneers. Much of the research focuses on measuring the value of a year spent in school.[1] But in recent years, the research has begun to explore more fully the implications of the fact that schooling is heterogenous, both in quality and in subject matter, and that people make decisions about schooling without complete knowledge of their tastes and talents for different types of work. This article briefly summarizes three avenues that I have been pursuing: First, what are the implications of the fact that education is a sequential choice made under uncertainty? Second, can we get inside the black box of years-spent-in-school by examining the effects of actual courses taken on the payoff to school? And third, I use a new methodology to revisit an old and controversial question—do school inputs affect outcomes?

Altonji is a professor of economics at Northwestern University and a research associate in the NBER's labor studies program. His profile appears in this issue.

The Demand for and Return to Education When Education Outcomes Are Uncertain

The standard human capital model of schooling assumes that individuals are able to choose a future level of education with no uncertainty about actually completing that level. It also focuses on the number of years of school chosen, rather than on the specific major. In contrast, I model the demand for education as a sequence of choices made under uncertainty. I then examine how variables that influence tastes for school, ability to do college work, and the payoffs to particular college programs affect the expected return to a year of school.[2]

Three facts suggest that uncertainty is important, and they motivate this research. First, many individuals who plan to complete college instead drop out. Second, for some demographic groups the ex post returns to education are associated largely with completing high school or completing college. Such nonlinearities in the ex post returns, or a gap between the effect of education on wages and the borrowing rate, may produce substantial differences between ex ante and ex post returns to the first year or two of college. The return to the first year of college is not the earnings differential between individuals with 12 and 13 years of schooling. Rather, the return is the difference between the earnings of the person who stops at 12 years of education and the expected earnings net-of-education-costs of a person who attends the first year of college. Expected earnings depend on the earnings associated with 14, 15, 16, or more years of education. Expected earnings also depend on the probabilities of the various education outcomes for an individual who has completed year 13. Family background, aptitude, and other factors that affect the odds that an individual actually will complete the program may influence the expected return to starting college.

Third, there are large differences across fields of specialization in the earnings differential between graduates of college and high school. Individuals who do not know if they will be able to, but want to, complete a program in a particular field must consider the alternative options that result from starting that particular program.

A theoretical analysis and empirical investigation show that personal characteristics affect the ex ante rate of return to starting college, in part by altering the market payoffs to completing particular postsecondary programs of study, and in part by altering the completion probabilities. There are a number of specific empirical findings. First, the ex ante return to starting college for male high school graduates is higher than the ex post return to the first year of college because starting college provides the option to continue. Second, gender differences in the probability of completing a high-paying major tend to raise the return to college for men relative to women. Third, aptitude raises the ex ante return to starting college. Aptitude raises the return for men both by increasing the ex post payoffs to college and by favorably altering the probabilities of the various education outcomes conditional on starting college. Aptitude raises the ex ante return to education for women by increasing the ex post payoff to college. Fourth, an academic high school curriculum and a favorable family background raise the ex ante return for men but matter little for women.[3] Fifth, those who start college have a substantially higher ex ante internal rate of return to doing so than those who do not.

High School Curriculum and the Value of Education

Why does a year of schooling lead to substantial wage increases? How are these increases affected by what a student does while in school? These questions long have been neglected in the literature. The relevance of estimates of the payoff to specific courses for curriculum design is obvious, but such estimates also have implications for key questions regarding the economics of education, including the "human capital/screening" debate over why years spent in school have economic value. From the point of view of the human capital interpretations, one would hope that a year's worth of high school courses has value regardless of whether one requires an extra year to complete them.[4]

I used the National Longitudinal Survey of the High School Class of 1972 to provide the first systematic study of the effects of high school curriculum on postsecondary education and on success in the labor market.[5] The major problem in studying the consequences of curriculum is that the quantity and level of difficulty of courses are chosen by students and schools. The design of the dataset permits one to use as instrumental variables for the courses chosen by individuals the means for each high school of courses taken in each subject. I control for the other characteristics of the individual students, and for high school variables, including the average characteristics of the students in the high school. Unfortunately, differences across high schools in courses taken by the average student do not allow for a clean natural experiment. For example, the average number of math courses in a high school is likely to be correlated positively with the average family background, primary school preparation, ability of the student body, and quality of the courses. While I control for average student characteristics and for other high school level variables in the empirical analysis, the controls are almost certainly imperfect. Since there is little prior research or evidence on the effects of curriculum on wages, I also use simpler regression strategies that relate variation among students in curriculum to variation in wages and postsecondary education, as well as regressions that relate differences in curriculum to differences in outcomes among persons who attended the same high school.

My main finding for wage rates is that the return to additional courses in academic subjects is small. Even when one does not control for family background and ability, the instrumental variables estimates indicate that one more year of science, math, English, social studies, and foreign language would lead to a wage increase of only 0.3 percent. In other words, the effect of a year equivalent of courses is much smaller than the value of one year in high school. This conclusion is not sensitive to alternative ways of dividing up "credit" for the effect of postsecondary education on wages between high school courses and college, in part because the instrumental variables estimates show only a modest effect of academic courses on years of college completed. The least squares regressions, especially when a fixed effect is included for each high school, suggest larger estimates, particularly for mathematics. However, these estimates are likely to be biased upward. In any event, when one controls for family background, the different estimation methods all produce estimates of the value of a year of additional courses that are far below the value of a year of high school. Taken at face value, the results seem more consistent with a screening view of high school than a human capital view.

While there are many reasons to challenge the specific estimates I obtain, almost all suggest that the estimates for academic courses are, if anything, overstated. The reason is that the quality of courses is correlated positively with the quantity in academic areas such as math and science. Furthermore, both the quantity and the quality of courses are correlated positively with favorable personal and school characteristics. While I believe that high school curriculum does matter, and I find the

low estimates to be surprising and challenging, they are not easy to dismiss with an appeal to unobserved heterogeneity in courses, schools, and students. Hopefully, this work will stimulate a major effort to understand how what one studies in school influences the value of a year of school.

Do School Inputs Matter?

There is a huge literature that examines the relationship between measures of school quality and achievement, and a smaller literature that asks whether measures of school quality are related to wages.[6] The previous research on wage effects used variation in school inputs across geographic areas or across schools. However, there is still much disagreement about what the evidence says. In a recent paper, Thomas Dunn of Syracuse University and I provide the first study that uses variation among siblings in high school inputs to identify the effects of these variables on the wages.[7] By adding to our wage models constant terms for each family, we are able to control for unobserved variables that are common to siblings. This gets around the criticism that variation across families, schools, or states in school inputs is related to other characteristics that affect wage levels. While one would presume that persons from more favorable family environments (and communities) also attend better schools, the sign of the bias from failure to fully control for background depends on the relative strength of the relationship between omitted factors and both family background and school quality.

Our study finds that differences between siblings in the quality of the high school attended have a substantial positive relationship to differences in the wages of high school graduates. Increases in teachers' salary and expenditures per pupil (equal to the interquartile range for these variables) lead to wage increases of 10.6 percent and 5.6 percent, respectively, for a student who leaves school after high school. There is little evidence that the results are biased by a positive correlation between sibling differences in school inputs and in other factors that are favorable to wages. Future research using sibling pairs to analyze the effects of school inputs is necessary.

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[1] *This topic, as well as the analysis of changes over time in the return to education, has received a lot of attention from members of the NBER's labor studies group in recent years. Among the papers are: J. Angrist and A. Krueger, "Does Compulsory School Attendance Affect Schooling and Earnings?"* Quarterly Journal of Economics *(November 1991), pp. 979–1014, and O. Ashenfelter and A. Krueger, "Estimates of the Economic Return to Schooling from a New Sample of Twins,"* American Economic Review, *forthcoming.*

[2] *This work is presented in J. G. Altonji, "The Demand for and Return to Education When Education Outcomes Are Uncertain,"* Journal of Labor Economics *(January 1993), pp. 48–83. See also C. F. Manski, "Schooling as Experimentation: A Reappraisal of the Postsecondary Dropout Phenomenon,"* Economics of Education Review *8, 4 (1989), pp. 305–312.*

[3] *J. G. Altonji and T. A. Dunn, "The Effects of Family Characteristics on the Return to Education,"* Review of Economics and Statistics *(forthcoming) studies the effects of parental education on the ex post return to a year of school.*

[4] *See A. Weiss, "Human Capital Versus Signaling Explanations of Wages,"* Journal of Economic Perspectives *(Fall 1995), pp. 133–154.*

[5] *See J. G. Altonji, "The Effects of High School Curriculum on Education and Labor Market Outcomes,"* Journal of Human Resources *(Summer 1995), pp. 410–438, which provides citations to a few related studies.*

[6] *Surveys of this literature include: E. Hanushek, "The Economics of Schooling: Production and Efficiency in Public Schools,"* Journal of Economic Literature *24 (September 1986), pp. 1141– 1177; L. V. Hedges, R. D. Laine, and R. Greenwald, "Does Money Matter? A Meta Analysis of Studies of the Effects of Differential School Inputs on Student Outcomes,"* Educational Researcher *23 (1994), pp. 5–14; J. Betts, "Is There a Link Between School Inputs and Earnings? Fresh Scrutiny of an Old Literature," in* Does Money Matter? The Link Between Schools, Student Achievement, and Adult Success, *G. Burtless, ed. Washington, DC: Brookings Institution, 1955; and D. Card and A. B. Krueger "Labor Market Effects of School Quality: Theory and Evidence," NBER Working Paper No. 5450, February 1996.*

[7] *J. G. Altonji and T. A. Dunn, "Using Siblings to Estimate the Effects of School Quality on Wages,"* Review of Economics and Statistics, *forthcoming.*

Labor Markets and Public Assistance Programs[1]

Rebecca M. Blank*

The current heated debate over welfare reform focuses on getting more welfare recipients to work. The effectiveness of changes in the design of welfare programs depends heavily on the economic environment surrounding these programs. Changes in the macroeconomy and the labor market can have large effects on the behavior and the well-being of poor families.

Economic Growth and Poverty[2]

It is a widely held belief that economic growth helps the poor. Many have claimed that a rising tide not only lifts all boats, but might even lift the smaller boats faster than the larger boats. Indeed, the steep declines in poverty in the 1960s were caused almost entirely by strong and sustained macroeconomic growth.

The poor feel the impact of economic growth primarily through the labor market. When the economy expands, demand for labor rises and unemployment falls. This most benefits those who are unemployed, underemployed, employed part time, or out of the labor force entirely. Disproportionately, less-skilled workers experience much higher unemployment. The unemployment rate among workers without high school diplomas has been consistently about five times that of workers with college degrees over the past 20 years. Job expansions therefore help these workers and their families more than they help skilled workers.

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Given this relationship, it was puzzling when a strong and sustained recovery during the late 1980s brought the poverty rate down by only a small amount. Estimates based on historical experience would have predicted much steeper declines in poverty between 1983 and 1989. Subsequent analysis indicated that the decline in unemployment over the 1980s followed earlier patterns, as less-skilled workers expanded their employment as quickly as in the 1960s. Why then did poverty not decline as rapidly as in the 1960s?

The difference was attributable to changes in wages. In the 1960s, wages (for workers of all skill levels) increased at the same time that employment expanded. A 1 percent increase in GDP growth in the 1960s was correlated with a $2.18 increase in real weekly wages among the poorest decile of the population. As employment expanded, the result was a double-whammy effect on poverty: people worked more and earned more for each hour that they worked.

In contrast, over the 1980s, wages for less-skilled workers declined steadily. Between 1983 and 1989, GDP growth of 1 percent was correlated with a $0.32 decline in weekly wages for the poorest decile of the population. The result was that the employment expansions were offset by declining wages. People worked more, but they earned less for each hour that they worked. As a result, poverty fell by only a small amount.

In the 1990s, these effects continue to operate. Both 1992 and 1993 were years of aggregate economic expansion. For the first time in post–World War II history, however, poverty actually continued to rise as the economy expanded. Not until the third year of the expansion, in 1994, did poverty begin to fall.

In short, for the last 15 years, economic growth has not been as powerful in fighting poverty as it was in the past. This is bad news, since economic growth provides a win–win policy: everyone's standard of living improves, even as poor families catch up faster. Alternative policies to reduce poverty are much less attractive, requiring the government to design and administer programs and to use redistributive taxation. Part of the current frustration with public assistance programs may relate to the fact that antipoverty efforts have had to rely on *programs* more heavily in recent years, as economic expansions have had less effect on poverty, and such programs have in-herent limits to their effectiveness.

Work Opportunities for Less-Skilled Workers[3]

Two phenomena have been operating over time to make it harder for poor families to escape poverty through employment. First, declining wages for less-skilled workers mean that work by itself provides a less effective way out of poverty. Among men with less than a high school diploma who work full time all year, real weekly wages declined 22 percent between 1979 and 1993. The result is that less-skilled men face far worse labor market opportunities than their fathers did.

Among women with less than a high school diploma who work full time all year, real weekly wages declined only 6 percent, but these women started on a very low base and continue to earn only 71 percent of what less-skilled men earn. These women face essentially the same

(very poor) labor market opportunities as their mothers. Particularly since many single mothers cannot always work full time, for many poor women earnings alone will be inadequate to support a family. While there is substantial evidence that welfare-to-work programs can increase women's earnings and labor market involvement and decrease their use of welfare, few of these programs result in large improvements in women's total family income. This suggests that some form of ongoing subsidies to some share of women who leave welfare for work will be necessary if they are to be better off working than on welfare. These could be either in the form of wage subsidies (such as the Earned Income Tax Credit—EITC—provides) or in the form of income subsidies (through ongoing cash support, child care supplements, Food Stamps, and so on). Alternatively, expanded private support for these women (through expansions in child support payments, for example) also would help solve this problem.

Second, the growth in the share of female-headed families among the poor has made employment a less effective route out of poverty. In 1993, about 43 percent of all poor persons lived in a family headed by a single parent, almost all of them women; 35 percent live in families headed by married couples; the remaining 22 percent of the poor are unrelated individuals. Single-parent families face a triple disadvantage when they try to escape poverty through employment. First, there is only one adult who can go to work in these families, which limits their potential earned income. Second, the fact that the one adult is female typically means that her wages are well below those of equivalent less-skilled men. Third, because there is no other adult to provide child care, a substantial share of earnings often will go to pay for child care, which does little to improve the overall resources available to the family from work.

The result of these shifts is that it is currently harder for poor families to escape poverty (or to get off welfare) through employment than at any time in the past 30 years. Current efforts to increase employment and decrease the use of public assistance among poor families are occurring at a time when both the labor market and the demographic composition of families make this harder to achieve.

Evaluating Public Assistance Programs

All of this evidence suggests that cutting welfare may not reduce poverty, at least in the short run, even if it does result in greater labor market effort. At present, one-fifth of all poor families include one full-time year-round worker, yet they remain poor. Thus, the question of how best to design income support programs remains very important.

A substantial literature in economics investigates the nature and magnitude of incentive effects embedded in the design of assistance programs. For example, some research has looked at whether cross-state differentials in Aid to Families with Dependent Children (AFDC) benefits create incentives for the migration of poor families to high-benefit states, or whether these differences in benefits lead to differences in the length of time that women spend on welfare.[4] Most research in this area has found some disincentive effects, but they tend to be relatively small. For instance, while differences in cash assistance between states appear to induce some difference in women's propensity to work, the elasticity of the labor supply response is not large. Higher-range estimates of the labor market response to benefits suggest that for every $100 gained in monthly cash assistance, women will work two hours less per month.

One aspect of program design that often is underemphasized in the economics literature is the way in which the implementation and operation of programs encourage or discourage usage. In fact, only about two-thirds of all eligible women participate in the AFDC program, and a smaller share of eligible families participate in Food Stamps.[5] The likelihood that an eligible family will participate in public assistance is related to the economic environment (which affects their expected level and duration of need), the level of program benefits, and to the general availability of program offices. A surprisingly large number of women appear to stop receiving AFDC and Food Stamps even when they remain eligible for substantial benefits.

There are two possible ways to interpret this: it could reflect the fact that the welfare system often makes life unpleasant for its recipients, and many women will forgo substantial income to avoid participating in it. The alternative interpretation is that there is substantial unreported income available to women, either through their own earnings or those of boyfriends and relatives, and women replace welfare income with this income when it is available.

In general, the wariness toward broad-based cash assistance programs in the United States, which is reflected strongly in the current welfare reform debate, has moved the United States to run more in-kind programs, providing food, medical care, or housing subsidies rather than general support. More recently, the concern about behavior among public assistance recipients is resulting in policies that increasingly tie program eligibility to much more than a family's income level. For instance, the new welfare reform law

passed this summer makes cash support after two years available only to women who participate in job search programs. Alternatively, many states are limiting benefits to women who refrain from having additional children out of wedlock. The public assistance program that has grown fastest in the past five years—the EITC—is available only to workers.

This targeting makes programs more limited in whom they serve and what they cost. But such targeting also increases the administrative effort required to make the programs operate effectively, and may increase administrative costs even if it decreases direct benefit expenses.

If we could only count on macroeconomic growth to fight poverty, it would substantially reduce the need for a government bureaucracy to design programs, screen applicants, and monitor recipients. In a world where general job availability is not enough to help the poor, however, and in a world where general cash transfers are viewed with disfavor, then key questions in public assistance programs increasingly will revolve around how to design, implement, and monitor complicated targeted programs. The government often is considered less able to do this sort of administrative task well than the private sector. Greater movements in this direction, such as are embedded in many current welfare reform plans, may create greater problems of effective management. This may only increase public distrust about the effectiveness of antipoverty programs in the long run.

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[1]*Much of the discussion in this research summary (and particularly the final section) is taken from R. M. Blank,* It Takes a Nation: A New Agenda for Fighting Poverty, *forthcoming from Princeton University Press.*

[2]*The discussion in this section is based on R. M. Blank and A. S. Blinder, "Macroeconomics, Income Distribution, and Poverty," in* Fighting Poverty, What Works and What Doesn't, *S. Danziger and D. Weinberg, eds. Cambridge, MA: Harvard University Press, 1986; R. M. Blank, "Why Were Poverty Rates So High in the 1980s?" in* Poverty and Prosperity in the Late Twentieth Century, *D. Papadimitrious and E. Wolff, eds. London: Macmillan Press, 1993; R. M. Blank and D. E. Card, "Poverty, Income Distribution, and Growth: Are They Still Connected?* Brookings Papers on Economic Activity *(1993:2).*

[3]*The discussion in this section is based on R. M. Blank, "The Employment Strategy: Public Policies to Increase Work and Earnings," in* Confronting Poverty: Prescriptions for Change, *S. Danziger, G. Sandefur, and D. Weinberg, eds. Cambridge, MA: Harvard University Press, 1994, and "Outlook for the U.S. Labor Market and Prospects for Low-Wage Entry Jobs," in* The Work Alternative: Welfare Reform and the Realities of the Job Market, *D. Nightingale and R. Haveman, eds. Washington, D.C.: Urban Institute Press, 1995; and R. M. Blank and R. A. London, "Trends Among the Working Poor: The Impact of Economy, Family, and Policy," in* America's Working Poor, *T. Swartz and K. Weigert, eds. Notre Dame: University of Notre Dame Press, 1996.*

[4]*For instance, see R. M. Blank, "The Effect of Welfare and Wage Levels on the Location Decisions of Female-Headed Households,"* Journal of Urban Economics *24, 2 (1988), or "Analyzing the Duration of Welfare Spells,"* Journal of Public Economics *8, 1 (1990).*

[5]*For a discussion of these issues, see R. M. Blank and P. Ruggles, "When Do Women Use AFDC and Food Stamps? The Dynamics of Eligibility Versus Participation,"* Journal of Human Resources *31, 1 (1996).*

Banks and Security Markets

Gary Gorton*

What do banks do (that markets cannot do)? In the United States in 1845, the answer would have been that banks made loans and issued mortgages, but their most important role was to provide a medium of exchange by issuing private money.[1] By the late 19th century, U.S. capital markets were more developed, but at the same time large banks resembled German universal banks.[2] Passage of the Glass–Steagall Act in 1934 changed that by restricting banks' activities.[3] In 1996 banks face competition from money market mutual funds for deposit business and from junk bonds, commercial paper, and medium-term notes for bank loans.[4] While smaller firms continue to rely heavily on banks, banks are now engaged in many new activities, such as interest rate and currency swaps.[5] Whatever it is that defines banks as unique institutions, the pattern of bank activities has changed over the last 150 years as banking has interacted with the development of security markets. The challenge is to explain the persistence of banking as security markets increasingly develop.

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Banks and Security Markets in the Organization of Capitalist Economies

One problem in understanding what banks do is that the function of securities markets is not well understood. With James Dow, I address the issue of the connection between stock market price "efficiency" and

economic efficiency.[6] In this work, we assume that firms are operated by managers who must be compensated in a way that induces them to find desirable investment projects. The managers may make an effort to produce information, but are not always successful in receiving information. When they are not successful, they may be induced by their compensation contracts to rely on inferences drawn from changes in their firms' stock market prices. In such an economy, two types of information must be produced and transmitted in order to achieve the most efficient allocation of resources. First, the stock market must provide forward-looking or prospective information when informed traders produce information about the firm's investment opportunities for managers to act on. Second, the stock market must provide backward-looking or retrospective information when stock prices reflect informed traders' production of information about the outcomes of investment decisions made in previous periods. Managerial compensation based on stock prices then can induce managerial effort.

This model of the stock market seems to be what most economists have in mind when they speak of "market efficiency." Stock prices allocate resources by influencing investment decisions and by providing a way to monitor corporate managers. But, consider the same economy without the stock market but with banks instead. Banks design contracts to hire information-producing loan analysts who write prospective and retrospective reports about investment opportunities and managerial performance. Dow and I show that the banks can implement the same allocation as the efficient equilibrium of the stock market economy. Efficient security prices are neither necessary nor sufficient for economic efficiency.

That the savings–investment process might be equally well organized around banks as around security markets suggests empirically investigating the role of banks in economies where securities markets are less important than in the United States, as in Germany. For much of recent German history the stock market has been small and illiquid. German banks, though, can own stock legally. The question is whether bank block shareholding is, in some sense, a substitute for a liquid stock market. Schmid and I examine the role of banks in Germany, and show that in the 1970s firm performance was better when a bank was a large shareholder. This is consistent with the proposition that when banks obtain a block of stock (via a family selling out, or because of financial distress), they have an incentive to improve firm performance by monitoring because, effectively, the block cannot be sold (since the stock market is traded so thinly).[7] By the 1980s, however, German capital markets had developed further, and this role of banks was no longer present.[8]

Bank Uniqueness

Banks and securities markets may be substitutes but, even in economies with highly developed capital markets, banking persists as an important institution. This suggests that banks perform some tasks that markets cannot accomplish, even when they are highly developed.

On the asset side of the balance sheet, banks originate loans. To the extent that bank loans are held by the bank (so that bank equity is at risk), there is an incentive to oversee the activities of borrowers to maintain the value of the loan. Because of free-riding, it is difficult for a large number of debt holders to interact with borrowers during certain states of the world: "monitoring" them, for example, when they are distressed, or verifying that they can repay the loan. A bank, by concentrating the debt, eliminates this problem.[9] Beyond this, the details of what "monitoring" really means are fuzzy. Moreover, the argument about concentration would seem to apply to all debt and so cannot explain the role of bank loans as distinct from corporate bonds.

The renegotiability of bank loans emanates from a contract provision that gives banks the right to seize collateral, and from the fact that a single agent is in a position to renegotiate. Kahn and I consider the optimality of this contract provision.[10] We model the interaction between a bank and a borrower when: 1) the borrower may have an incentive to (at a cost) increase the risk of a project if the project goes badly; while 2) the bank may have an opportunistic incentive to threaten early termination of the project. When the borrower seeks to add risk, the bank may respond by forgiving some debt to eliminate the borrower's incentive to add risk, liquidating the loan by seizing the collateral, raising the interest rate, or doing nothing. All of these outcomes happen in equilibrium. In fact, the variance of the value of the firm is state dependent in equilibrium, a result that has implications for the application of option-pricing methods to corporate securities. The contract provision allowing the bank the right to initiate renegotiation by threatening to seize the collateral is optimal when this type of renegotiation, that is, monitoring, is valuable ex ante.

Banks not only provide unique services on the asset side of the balance sheet, but they also produce a medium of exchange on the liability side of the balance sheet. Pennacchi and I explain this.[11] If agents face unanticipated needs to consume, and face a cash-in-advance constraint, then they will have to dissave

by selling securities to obtain cash. When they sell securities, they may sell in a market where better-informed traders take advantage of this liquidity need. The uninformed consumers lose money, on average, when they are less informed about the value of the risky securities they are selling. Their loss to informed traders is increasing in the variance of the value of the security being sold. Therefore, a low-variance security or, in particular, a riskless security with a known value, would minimize or avoid such losses. Banks produce such a riskless trading security by issuing debt, which is a claim on a diversified portfolio (of loans). If the debt is not riskless, the government can improve matters with deposit insurance.[12]

Panics and the Origin of Bank Regulation

The combination of demand deposits, which can be redeemed at par on demand, with nontraded bank loans can create the possibility of an event in which depositors en masse exercise their right to demand cash for their deposits. In the United States large numbers of relatively undiversified banks issuing demand deposits faced repeated banking panics of this type. There is nothing mysterious about banking panics. I show that in the United States banking panics occurred at the peak of the business cycle when consumers received information forecasting a recession.[13] At the peak, consumers know that they will want to dissave in the coming recession. Their savings are in banks, some of which will fail during the recession. Because of asymmetric information about the value of the nontraded bank loans, depositors cannot distinguish the banks that will fail from those that will not. As a result, when they receive information forecasting a recession, rational, risk-averse depositors withdraw from all banks. This event is a banking panic.

During the 19th century, banks formed coalitions—clearinghouses—partly to address the problem of banking panics. Clearinghouses monitored member banks by restricting their activities, conducted strict bank examinations, and enforced sanctions against members to enforce compliance. During panics clearinghouses organized suspensions of the payment of cash to honor demand deposits; instead of paying out cash, they provided a form of deposit insurance by issuing their own private money (claims on the clearinghouse) to honor deposit contracts. Since this money was a claim on the clearinghouse, depositors were insured against the failure of any particular member bank, although not against the failure of the clearinghouse (which never occurred in U.S. history).[14]

Panics can be seen in the context of the industrial organization of banking. Demand deposits are a medium of exchange that clears internally in the banking system, not externally through trade in a market. Internal clearing closed the external market in which bank claims were traded, the banknote market of the pre–Civil War Era. But this caused an information asymmetry, since there was no longer any information-revealing market about the value of banks.[15] But, without an information-revealing market, how are depositors to monitor banks? Banking panics can be seen as a monitoring mechanism and, in this sense, were desirable.[16] The information asymmetry created the necessary condition for panics, but also the incentives for the private provision of bank regulation, examination, and insurance. Ultimately, government bank regulation and insurance took over the clearinghouse functions.

Current Regulatory Issues

In the 1980s, while a number of new debt markets opened or grew significantly (including junk bonds and commercial paper), banks failed at increasing rates as they became unprofitable. One widespread explanation for the high failure rate of banks involves the moral hazard attributable to underpriced deposit insurance. In this view, bank shareholders have an incentive to take on risk when the value of the bank charter falls sufficiently.[17] This view is inconsistent with banks being run by managers and, it turns out, with empirical evidence on which types of banks want to take on inefficient risk.

Rather than assume that shareholders directly control bank actions, Rosen and I assume that bank managers, who may own a fraction of the bank, make the lending decisions.[18] If managers have different objectives than outside shareholders, and disciplining managers is costly, then managerial decisions may be at odds with the decisions that outside shareholders would like them to take.[19] We show empirically that, contrary to the moral hazard view, excessive risktaking by banks occurred at those banks controlled by managers with stockholdings well below 50 percent, but sufficiently high that they constituted important blockholders. This result suggests that a failure in the market for corporate control in banking can explain the persistence of unprofitability of banking in the 1980s.

Another explanation for the persistence of bank failures during the 1980s concerns "regulatory forbearance," that is, the unwillingness of regulators to close insolvent banks. This view raises more general welfare questions concerning bank regulation. What is the objective function of regulators? What should

they do when banks become riskier? Winton and I consider the question of bank capital requirements in a general equilibrium setting.[20] General equilibrium imposes the discipline that the capital in banks must come from somewhere in the economy. We show that there are unique costs associated with bank capital, and that regulators optimally will not, indeed cannot, force banks to raise costly capital. The basic argument is that consumers need a riskless transactions medium supplied by banks, as I have discussed here. Holding bank equity exposes consumers to possible losses should they need to sell the equity. To the extent that they must hold bank equity, and not demand deposits, they face losses if they have unanticipated needs requiring them to sell their bank equity. But this risk is priced and so imposes a cost on equity that is unique to the banking industry. We show that capital requirements never can be binding: if they are too onerous they can be avoided by exit from the banking industry. But then banks do not supply the socially valuable services that markets cannot supply. To avoid such socially undesirable exit, the regulators may take actions that resemble forbearance. This, however, is socially optimal.

Recent Developments in Banking

Banking has been transformed in the last 15 years. One major change has been the opening and growth of the market for loans. According to theory, bank loans are not liquid: no one should buy a loan, because then banks will lack incentives for monitoring. Moreover, if loans and bonds are substitutes, a direct contract with a firm dominates purchasing a loan, since the buyer of a loan relies on the bank for representation if the firm goes bankrupt. Yet the bank, having sold the loan, would appear to have little incentive to perform. Despite this, the market for such loans is now enormous.[21] Pennacchi and I empirically search for implicit contract features that make loan sales compatible with incentives.[22] We find some evidence that banks selling loans keep a portion of the loan, and that the price of the loan being sold reflects this.

Another major change in banking has been the advent of the derivatives market, a market with commercial banks at its center. Derivatives have been controversial because of the difficulty in valuing them. Rosen and I investigate the involvement of U.S. commercial banks in the market for interest rate swaps.[23] We find that banks, generally speaking, do not appear to be taking on excessive risk in this market. Banks seem to have small net positions in derivatives.

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[1]*See G. Gorton, "Reputation Formation in Early Bank Note Markets,"* Journal of Political Economy *104 (1996), pp. 346–397; and "Pricing Free Bank Notes," NBER Working Paper No. 3645 (1990, out of print).*

[2]*See C. Calomiris, "The Costs of Rejecting Universal Banking: American Finance in the German Mirror, 1870– 1914," in* The Coordination of Activity Within and Between Firms, *N. Lamoreaux and D. M. G. Raff, eds. Chicago: University of Chicago Press, 1995.*

[3]*On the Glass–Steagall Act, see R. Kroszner and R. Rajan, "Is the Glass–Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933,"* American Economic Review *84 (1994), pp. 810–832; "Organizational Structure and Credibility: Evidence from the Underwriting Activities of Commercial Banks Before Glass–Steagall," NBER Working Paper No. 5256, March 1995; and M. Puri, "Commercial Banks in Investment Banking: Conflict of Interest or Certification Role?"* Journal of Financial Economics *40 (1996), pp. 373–401.*

[4]*See G. Gorton and G. Pennacchi, "Money Market Funds and Finance Companies: Are They the Banks of the Future?" in* Structural Change in Banking, *M. Klausner and L. J. White, eds. Homewood, IL: Business One-Irwin, 1993. Also see L. Beneveniste, M. Singh, and W. J. Wilhelm, "The Failure of Drexel Burnham Lambert: Evidence on the Implications for Commercial Banks,"* Journal of Financial Intermediation *3 (1993), pp. 104–137. For surveys of recent developments in banking, see A. Berger, A. Kashyap, and J. Scalise, "The Transformation of the U.S. Banking Industry: What a Long Strange Trip It's Been,"* Brookings Papers on Economic Activity *2, (1995); and J. Boyd and M. Gertler, "U.S. Commercial Banking: Trends, Cycles, and Policy," in* NBER Macroeconomics Annual 1993, *O. Blanchard and S. Fischer, eds. Cambridge, MA: MIT Press.*

[5]*On loans to small business, see M. Petersen and R. Rajan, "The Benefits of Lending Relationships: Evidence from Small Business Data,"* Journal of Finance *49 (1994), pp. 3–37; and "The Effect of Credit Market Competition on Lending Relationships,"* Quarterly Journal of Economics *110 (1995), pp. 407– 443. On swaps, see G. Gorton and R. Rosen, "Banks and Derivatives," in* NBER Macroeconomics Annual 1995, *B. S. Bernanke and J. J. Rotemberg, eds. Cambridge, MA: MIT Press.*

[6]*J. Dow and G. Gorton, "Stock Market Efficiency and Economic Efficiency: Is There a Connection?" NBER Working Paper No. 5233, August 1995.*

[7]*See also F. Allen and D. Gale, "Financial Markets, Intermediaries, and Intertemporal Smoothing," Working Paper #5-95, The Wharton School, University of Pennsylvania.*

[8]*In a series of papers Hoshi, Kashyap, and Scharfstein have investigated the role of banks in Japan. They find that the main banks of* keiretsus *interact with member firms in ways that the market apparently cannot reproduce. See T. Hoshi, A. Kashyap, and D. Scharfstein, "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups,"* Quarterly Journal of Economics *106 (1991), pp. 33–60; "The Role of Banks in Reducing the Costs of Financial Distress in Japan,"* Journal of Financial Economics *27 (1990), pp. 67–88; and "Bank Monitoring and Investment: Evidence from the Changing Structure of Japanese Corporate Banking Relationships," in* Asymmetric Information, Corporate Finance, and Investment, *R. G. Hubbard, ed. Chicago: University of Chicago Press, 1990.*

[9]*The idea of banks as monitors is attributable to D. Diamond, "Financial*

Intermediation and Delegated Monitoring," Review of Economic Studies *51 (1984), pp. 393–414.*

[10]Also see R. Rajan, "Insiders and Outsiders: The Choice Between Informed and Arm's-Length Debt," Journal of Finance *47 (1992), pp. 1367–1400; S. Sharpe, "Asymmetric Information, Bank Lending, and Implicit Contracts: A Stylized Model of Customer Relationships,"* Journal of Finance *45 (1990), pp. 1069–1087.*

[11]G. Gorton and G. Pennacchi, "Financial Intermediaries and Liquidity Creation," Journal of Finance *45 (1990), pp. 49–72.*

[12]Other notions of liquidity production by banks are given by B. Holmstrom and J. Tirole, "Private and Public Supply of Liquidity," MIT mimeo, 1995; and D. Diamond and P. H. Dybvig, "Bank Runs, Deposit Insurance, and Liquidity," Journal of Political Economy *91 (1983), pp. 401–419.*

[13]G. Gorton, "Banking Panics and Business Cycles," Oxford Economic Papers *40 (1988), pp. 751–781. Also see G. Gorton and C. Calomiris, "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in* Financial Markets and Financial Crises, *R. G. Hubbard, ed. Chicago: University of Chicago Press, 1991.*

[14]See G. Gorton, "Clearinghouses and the Origin of Central Banking in the United States," Journal of Economic History *45 (1985), pp. 277–283; and G. Gorton and D. Mullineaux, "The Joint Production of Confidence: Endogenous Regulation and Nineteenth-Century Commercial Bank Clearinghouses,"* Journal of Money, Credit and Banking *19 (1987), pp. 458–468. See also G. Gorton, "Bank Suspension of Convertibility,"* Journal of Monetary Economics *15 (1985), pp. 177–193.*

[15]Banknotes may have survived in some form but faced a prohibitively high tax when the federal government began printing money under the National Banking Acts passed during the Civil War. In any case, the trend toward the use of demand deposits in place of notes was already clear.

[16]See G. Gorton, "Self-Regulating Bank Coalitions," The Wharton School mimeo, 1989; and F. Allen and D. Gale, "Optimal Financial Crises," The Wharton School mimeo, 1996.

[17]See M. Keeley, "Deposit Insurance, Risk, and Market Power in Banking," American Economic Review *80 (1990), pp. 1183–1200; and A. Marcus, "Deregulation and Bank Financial Policy,"* Journal of Banking and Finance *8 (1990), pp. 557–565.*

[18]G. Gorton and R. Rosen, "Corporate Control, Portfolio Choice, and the Decline of Banking," Journal of Finance *50 (1995), pp. 1377–1420.*

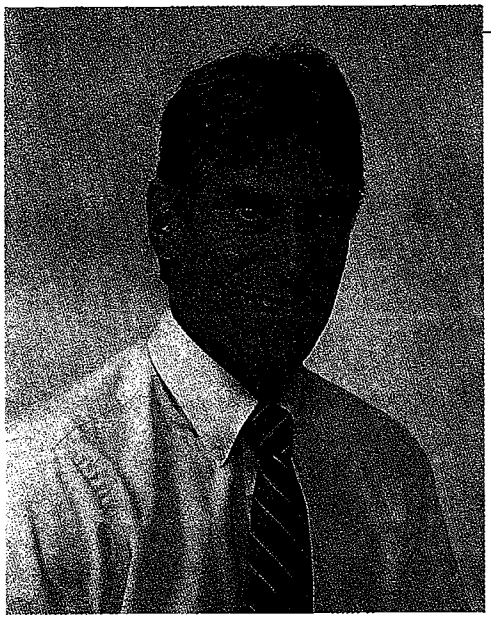
[19]If a bank's (market-value) capital ratio is sufficiently low, then both managers and outside shareholders may agree that the bank should maximize the value of deposit insurance. Rosen and I do not dispute this argument. Rather we focus on the prior question of how the bank came to have a low capital ratio.

[20]G. Gorton and A. Winton, "Bank Capital Regulation in General Equilibrium," The Wharton School mimeo, 1996.

[21]See G. Gorton and G. Pennacchi, "Are Loan Sales Really Off-Balance Sheet?" Journal of Accounting, Auditing and Finance *4, 2 (1989), pp. 125–145; G. Gorton and J. Haubrich, "The Loan Sales Market," in* Research in Financial Services, Volume 2, *G. Kaufman, ed. Greenwich, CT: JAI Press, 1990.*

[22]See G. Gorton and G. Pennacchi, "Banks and Loan Sales: Marketing Nonmarketable Assets," Journal of Monetary Economics *35 (1995), pp. 389–411.*

[23]See G. Gorton and R. Rosen, "Banks and Derivatives," in NBER Macroeconomics Annual 1995, *op. cit.*



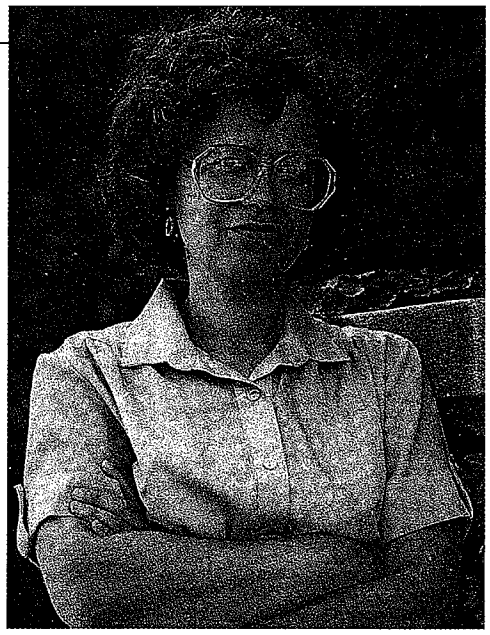
NBER Profile: *Joseph G. Altonji*

Joseph G. Altonji is a research associate in the NBER's Program in Labor Studies and a professor of economics at Northwestern University. He received his B.A. and M.A. degrees in economics from Yale University in 1975, and a Ph.D. in economics from Princeton University in 1981. From 1980–86 he served on the faculty of Columbia University. He also has been a visiting professor of economics at Princeton.

Altonji teaches labor economics and econometrics. He has worked on a variety of topics, including the nature of labor market fluctuations, labor supply, consumption, the effects of immigration on the labor market, the returns to job seniority, intergenerational links in income and consumption, information and the labor market, the economics of education, and econometric methods. He is currently a coeditor of the *Journal of Human Resources* and has served on the Board of Editors of the *American Economic Review.*

Altonji is married to Cynthia Nethercut, who holds an M.P.A. from the Woodrow Wilson School at Princeton and is a manager for the Regional Transportation Authority in Chicago. They have two children: Matthew, 8, and Mary, 6. Altonji enjoys playing in Evanston softball leagues, and coaching soccer and baseball.

NBER Profile: *Rebecca M. Blank*

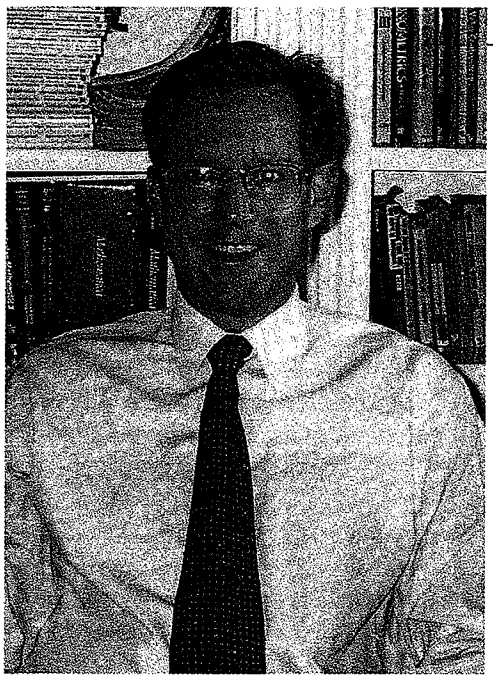


Rebecca M. Blank is a research associate in the NBER's labor studies program and a professor of economics at Northwestern University. Prior to coming to Northwestern, she taught at Princeton University, and served for a year as a senior staff economist with the President's Council of Economic Advisers.

Blank holds a Ph.D. in economics from MIT. Her research focuses on the interaction among the macroeconomy, government antipoverty programs, and the behavior and well-being of low-income families. She has studied the relationship between economic growth and income distribution over the 1980s, and has written a book comparing social protection programs in the United States and other industrialized countries: *Social Protection Versus Economic Flexibility: Is There a Trade-Off?* Her latest book project, *It Takes a Nation: A New Agenda for Fighting Poverty,* forthcoming from Princeton University Press, analyzes the recent discussion about poverty and public policy in the United States.

Blank is married to Johannes Kuttner, and they have a six-month-old daughter, Emily Kuttner. Both Becky and her husband are "total policy wonks" and enjoy arguing about politics and public policy. Becky used to spend much of her spare time reading fiction, but now plays with her baby instead.

NBER Profile: *Gary B. Gorton*



Gary B. Gorton is a tenured professor of finance at The Wharton School (University of Pennsylvania) and a research associate in the NBER's Program in Corporate Finance. He received a B.A. in Chinese Language and Literature from Oberlin College in 1973 and an M.A. in Chinese Studies from the University of Michigan the following year. Shifting fields, he received an M.A. in economics from Cleveland State University in 1977, and a Ph.D. in economics from the University of Rochester in 1983.

Gorton joined the Wharton faculty in 1984 as an assistant professor of finance, was promoted to associate professor in 1990, and to full professor in 1995. He also has taught at the University of Chicago's Graduate School of Business, and served as both a senior economist and an advisor to the Federal Reserve Bank of Philadelphia.

Gorton's research, particularly on banking, has been published in all the major economic journals and in several NBER books. When he is not engaged in research on financial economics, Gorton can be found playing with his two red-headed daughters, Nicole (2) and Danielle (10 months) and with their Great Dane puppy, Blue. Otherwise, he is listening to his red-headed wife discourse on tax arbitrage.

Conferences

International Seminar on Macroeconomics

The NBER's 19th annual International Seminar on Macroeconomics took place at the Institute for Advanced Studies in Vienna on June 17 and 18. Cochair Jeffrey A. Frankel, NBER and University of California, Berkeley, along with organizers Torsten Persson, NBER and Stockholm University, and James H. Stock, NBER and Harvard University, planned this program:

Paul Gregg and
Alan Manning, London School of Economics, "Skill-Biased Change, Unemployment, and Wage Inequality"
Discussants:
Richard Rogerson, University of Minnesota, and
Dennis Snower, Birkbeck College

Giuseppe Bertola, NBER and Università di Torino, and
Richard Rogerson, "Institutions and Labor Relocation"
Discussants:
Alan B. Krueger, NBER and Princeton University, and
Josef Zweimuller, Institute for Advanced Studies

Lawrence J. Christiano and
Martin S. Eichenbaum, NBER and Northwestern University, and
Charles Evans, Federal Reserve Bank of Chicago, "Monetary Policy Shocks and Their Consequences: Theory and Evidence"
Discussants:
Christopher A. Sims, NBER and Yale University, and
Francesco Giavazzi, Universita Bocconi

Ben S. Bernanke, NBER and Princeton University, and
Ilian Mihov, Princeton University, "Central Bank Responses to Inflation: A Comparative Study"
Discussants:
Lawrence J. Christiano, and Jürgen von Hagen, University of Mannheim

Lars E. O. Svensson, NBER and Stockholm University, "Inflation Forecast Targeting: Implementing and Monitoring Inflation Targeting"
Discussants:
Kenneth S. Rogoff, NBER and Princeton University, and
Guido Tabellini, Innocenzo Gasparini Institute for Economic Research

Karen K. Lewis, NBER and University of Pennsylvania, "Are International Capital Market Restricted Countries Liquidity Constrained?"
Discussants:
Christopher D. Carroll, NBER and Johns Hopkins University, and
Guglielmo Weber, Università di Padova

Janice C. Eberly, NBER and University of Pennsylvania, "International Evidence on Investment and Fundamentals"
Discussants:
John Hassler, Stockholm University, and
Simon Gilchrist, Boston University

Tamim Bayoumi and
David Coe, International Monetary Fund, and
Elhanan Helpman, NBER and Tel Aviv University, "R and D Spillovers and Global Growth"
Discussants:
Charles Bean, London School of Economics, and
Per Krusell, University of Rochester

Gregg and **Manning** argue for making relative wages an argument of the labor supply function (or wage curve) in order to explain the observed patterns of wage inequality and unemployment. If this is done, they expect that labor market institutions will be much less important than is generally assumed in determining longer-run labor market outcomes, and that policies toward education will be much more important.

Despite stringent restrictions on dismissal in most European countries, rates of job creation and destruction are remarkably similar across European and North American labor markets. **Bertola** and **Rogerson** show that relative-wage compression is conducive to higher employer-initiated job turnover. They argue that wagesetting institutions and job-security provisions differ across countries in ways that are both consistent with rough uniformity of statistics on job turnover and readily explained by intuitive theoretical considerations.

Christiano, Eichenbaum, and **Evans** present new evidence on the

credibility of certain measures of monetary policy shocks. They then present new results on the response of aggregate profits and both industry-level and aggregate real wages to a monetary policy shock. Finally, they use these facts to evaluate the plausibility of two models of the monetary transmission mechanism. They find that the sticky-price model leads to the perverse implication that profits rise after a monetary contraction. They conclude that sticky prices alone are not sufficient to account for the key facts: labor market frictions, whose effect is to inhibit cyclical movements in marginal costs by mimicking very high labor supply elasticities, need to be embedded in the current general equilibrium sticky-price models. They reach the same conclusion with the limited participation model. They conclude that, as with the sticky-price models, it is important to embed labor market frictions, whose effect is to mimic a high elasticity of labor supply, into the current generation of limited participation models.

Since 1975 the Bundesbank has described its monetary policy strategy as money-growth targeting. **Bernanke** and **Mihov** show that Bundesbank policy is characterized better as inflation targeting, in the sense that forecasted inflation explains a much greater share of the historical variation in the "Lombard rate" than does forecasted money growth. They also provide estimates of Bundesbank operating procedures to support their use of the Lombard rate as an indicator of German monetary policy.

Svensson shows that inflation targeting implies inflation *forecast* targeting: the central bank's inflation forecast becomes an intermediate target. Inflation forecast targeting simplifies both the implementing and the monitoring of monetary policy. The inflation forecast is actually an ideal intermediate target: it is most correlated with the goal; easier to control than the goal; more observable than the goal; and very transparent. Money growth targeting generally leads to higher variability of inflation than inflation targeting. In the rare special cases when either money growth or the exchange rate is the best intermediate target, inflation forecast targeting automatically implies the relevant intermediate target.

Countries do not share risk optimally. Explanations for this imperfect risksharing must incorporate restrictions in international capital movements with the presence of nontradables. **Lewis** examines whether restrictions in the international capital market imply different liquidity constraints for unrestricted countries and, hence, different consumption-smoothing behavior. She shows that countries facing some restrictions exhibit significantly different consumption behavior over time.

Eberly specifies a model in which a firm may face fixed, linear, and convex costs of investing; she estimates the resulting investment function using firm-level data from 11 countries. She finds important nonlinearities, consistent with fixed or other nonquadratic costs, in the relationship between investment and fundamentals for most countries.

A country can raise its total factor productivity by investing in R and D. But countries also can boost their productivity by trading with other countries that have large "stocks of knowledge" from cumulative R and D activities. Using a special model that incorporates R and D spillovers among industrial countries, and from industrial countries to developing countries, **Bayoumi, Coe,** and **Helpman** find that R and D, R and D spillovers, and trade all play important roles in boosting growth in industrial and developing countries.

Also participating in this conference were: Philippe Bacchetta and Walter Wasserfallen, Studienzentrum Genzensee; NBER President Martin Feldstein, also of Harvard University; Vitor Gaspar, Banco do Portugal; Robert J. Gordon, NBER and Northwestern University; Henri Pages, Banque de France; and conference cochair Charles Wyplosz, Institut Européen d'Administration des Affaires.

These papers and their discussions will be published in a special edition of the *European Economic Review.*

Franco–American Seminar

Approximately 100 economists from 12 countries attended the NBER Franco–American Seminar on "R and D, Innovation, and Productivity." It was held in Strasbourg, France in June 1996 in conjunction with the 10th International Conference of l'Association pour le Développement en Economie et Statistique (ADRES). The topic of the ADRES Conference this year was "The Economics and Econometrics of Innovation." Three of the sessions were sponsored by the NBER: Innovation and Market Share; Knowledge Spillovers; and Patent Design and Competition Policy. The conference itself was organized by Bruno Crepon, INSEE Paris; David Encaoua, Université de Paris I; Bronwyn H. Hall, NBER and University of California, Berkeley; Francois Laisney, Université Louis Pasteur, Strasbourg; and Jacques Mairesse, NBER and INSEE Paris. The following papers were presented at the Franco–American Seminar:

Bronwyn H. Hall, and **Katrin Vopel**, University of Mannheim, "Innovation, Market Share, and Market Value"

Corinne Barlet, Emmanuel Duguet, David Encaoua, and **Jacqueline Pradel,** all of Université de Paris I, "An Econometric Analysis of Innovation Outputs in French Manufacturing"

Lee Branstetter, Dartmouth College, "The Scope of Knowledge Spillovers"

Carlo Carraro, University of Venice, and **Antoine Soubeyran,** Université d'Aix-Marseille II, "R and D Cooperation, Innovation Spillovers, and Environmental Dumping"

Claude Crampes and **Corinne Langinier,** Université des Sciences Sociales, Toulouse, "Information Disclosure in the Renewal of Patents"

Jean O. Lanjouw, NBER and Yale University, and **Josh Lerner,** NBER and Harvard Business School, "Preliminary Injunctive Relief: Theory and Evidence from Patent Litigation" (NBER Working Paper No. 5689)

Hall and **Vopel** investigate the relationship among R and D spending, market share, and market value in large U.S. manufacturing firms. Using a newly constructed dataset that contains a measure of the average sales share obtained by firms in the markets in which they compete, they confirm a recent finding of Blundell, Griffith, and Van Reenen (who use U.K. data) that the stock market valuation of innovative output is higher when a firm has large market share. This finding also holds in the United States when innovative activity is measured as R and D spending. Further, in the U.S data, the higher market value is related more strongly to the size of the firm than to its market share. The authors argue that a possible implication is that the cost-reducing (Schumpeter) effect of being a dominant firm in an innovative industry may be as important as the revenue-enhancing (Gilbert and Newberry) effect, which is linked explicitly to market share. However, they caution that their results are somewhat preliminary.

Using data on French firms, **Barlet, Duguet, Encaoua,** and **Pradel** examine the link between innovation implementation by manufacturing firms and their share of sales from innovation. Using the results of a new survey of innovative activity and sources of innovation, they find that the sales share of innovative products is driven by demand from users and by new technology, with effects that are roughly equal in magnitude. The return on product imitation decreases with the sectoral innovation level, while the return on real product innovation increases.

Branstetter uses data on firms in the United States and Japan to investigate the geographical extent of knowledge spillovers within and between these two countries. His paper was motivated by the recent theoretical literature in international trade and economic growth, which has paid considerable attention to the potential role of technological externalities in determining the pattern of trade. In a number of contexts, it has been shown that these types of externalities can generate multiple equilibriums in the global pattern of specialization and trade, with different consequences for the relative welfare of the trading countries. In such models, temporary government policies can have lasting effects by pushing the global economy into a particular equilibrium. However, the prediction of multiple equilibriums generally hinges on the assumption that the technological externalities are intranational rather than international in scope. Branstetter points out shortcomings in previous efforts to estimate the effects of intranational and international knowledge spillovers. He then provides new estimates of the relative impact of these spillovers at the firm level, using previously unexploited panel data from the United States and Japan. His results, in con-

trast to those of some previous studies, indicate that knowledge spillovers are primarily intranational in scope, providing empirical confirmation of a crucial assumption in much of the previous theoretical literature.

Using a theoretical model of the reaction of firms to changes in environmental regulation, **Carraro** and **Soubeyran** investigate the effects of environmental dumping on technological choice and firm location. Firms in a country with more stringent environmental regulation (such as higher taxes) may decide either to relocate their plants in the country where regulation is more lax, or to adopt a new environmental-friendly technology. The authors show that, even if firms in the industry share the same initial technology and are allowed to enter the industry freely, in equilibrium they make different choices in response to the same environmental policy. In particular, the dumping policy may not be able to attract many firms because they may prefer to cooperate in carrying out environmental R and D rather than to relocate their plants abroad. Under some conditions, environmental dumping can be effective in attracting firms to a location, and under other conditions R and D cooperation is the optimal reaction to a cross-country difference in environmental regulations.

Crampes and **Langinier** present a model of patent choice allowing strategic decisions in a sequential game with two agents: a patentholder, who knows the characteristics of the market perfectly, and a potential entrant who has no information about the value of demand. The authors show that there exists no separating equilibrium, because the incumbent in a high-valued market always has some incentive to mimic the behavior of a firm in a bad market. Consequently, they find some equilibriums in which the incumbent prefers not to pay the renewal fee for the patent, hoping that it will be interpreted by the challenger as a signal of low market profitability.

Lanjouw and **Lerner** investigate whether established plaintiffs request preliminary injunctions in patent suits in order to prey on less financially healthy firms. They present a model in which differences in litigation costs drive the use of preliminary injunctions in civil litigation. Using a sample of 252 patent suits, they find evidence of predation. They go on to explore the impact of policy reforms, such as relaxation of the standards for obtaining a preliminary injunction, or easing of the financing costs associated with litigation.

Selected papers from the Franco–American and ADRES conferences will be published in a special issue of *Annales d'Economie et de Statistique*. A more detailed report of the conferences will become available on the NBER Web site:

http://www.nber.org

(see the menu on the home page for details).

Privatizing Social Security

For the past two years, the National Bureau of Economic Research has organized a research project on "Privatizing Social Security." The project, under the direction of Bureau President Martin Feldstein, studied the experience in countries that have shifted their retirement programs to funded, privately managed accounts. It has analyzed the issues that would be involved in a similar shift in the United States. On August 1 and 2, the Bureau held a conference at which the results of this research were discussed with a wider group that included experts from around the globe.

Sebastian Edwards, NBER and University of California, Los Angeles, "The Chilean Pension Reform: A Pioneering Program"

Discussant:
Stephen P. Zeldes, NBER and Columbia University

Malcolm Edey and
John Simon, Reserve Bank of Australia, "Australia's Retirement Income System: Implications for Saving and Capital Markets"

Discussant:
John Piggot, University of New South Wales

Alan Budd,
Nigel Campbell, and
Alexi Chan, HM Treasury, "The Pensions System in the United Kingdom"

Discussant:
Richard Disney, Institute for Fiscal Studies

Carlos Sales, Banobras, and
Fernando Solís and
Alejandro Villagómez Instituto Technológico Autónomo de México, "Pension System Reform: The Mexican Case"

Discussant:
Aaron Tornell, NBER and Harvard University

Joaquin A. Cottani and
Gustavo C. Demarco, Ministry of Finance, Argentina, "The Shift to a Funded Social Security System: The Case of Argentina"

Discussant:
Anita Schwarz, The World Bank

Panel Discussion: The Recommendations of the U.S. Social Security Advisory Council

Edward Gramlich, University of Michigan

Sylvester Schieber, Watson Wyatt Worldwide

Carolyn Weaver, American Enterprise Institute

Martin Feldstein, and
Andrew Samwick, NBER and Dartmouth College, "The Transition Path in Privatizing Social Security" (NBER Working Paper No. 5761)

Discussant:
John B. Shoven, NBER and Stanford University

Laurence J. Kotlikoff, NBER and Boston University, "Simulating the Privatization of Social Security in General Equilibrium" (NBER Working Paper No. 5776)

Discussant:
Thomas J. Sargent, NBER and Stanford University

James M. Poterba, NBER and MIT, and
David A. Wise, NBER and Harvard University, "Individual Financial Decisions in Retirement Saving Plans and the Provision of Resources for Retirement"

Discussant:
Jack Vanderhei, Employee Benefit Research Institute

Alan L. Gustman, NBER and Dartmouth College, and
Thomas L. Steinmeier, Texas Tech University, "Privatizing Social Security: The First Rounds of a Generic, Voluntary, Privatized U.S. Social Security System"

Discussant:
David M. Cutler, NBER and Harvard University

Olivia S. Mitchell, NBER and University of Pennsylvania, "Administrative Costs in Public and Private Retirement Systems"

Discussant:
Sylvester Schieber

As part of Chile's economic reforms, an inefficient pay-as-you-go pension system was replaced by a privately administered defined-contribution system. This reform has been credited with aiding the development of Chile's capital market, reducing government contingent liabilities, and stimulating Chile's traditionally anemic savings rate. A large number of pension reforms around the world are now being tailored after Chile's pioneering program. **Edwards** analyzes the most salient aspects of the Chilean program and evaluates its achievements to date.

Australia is currently in the early stages of introducing a system of self-provision for retirement through mandatory contributions to private pension funds. For most employees, the scheme eventually will replace, either fully or partially, the government pensions that are currently relied upon by a large majority of retirees. However, a number of policy issues remain. Perhaps the most important,

Edey and **Simon** point out, is the impact of the system on retirement decisions: a number of features of the system effectively create incentives for early retirement and continued reliance on the government pension.

The United Kingdom is one of the few major economies that does not face a serious long-term problem of public sector pension (social security) payments. The net present value of U.K. public pension liabilities is estimated at 4 percent of GDP, compared with over 100 percent in Japan, Germany, and France. As **Budd, Campbell,** and **Chan** explain, there are two principal reasons for this. First, the basic state pension has been held constant in real terms since 1980. It is currently about 15 percent of average earnings. If this policy is continued, future reductions in contributions rates will be possible. In addition, there is a second-tier state earnings-related pension scheme, but only 17 percent of employees belong to it. Most employees belong to funded private occupational schemes; membership has been encouraged by regulation and favorable tax treatment.

Sales, Solís, and **Villagómez** analyze the Mexican pension reform and preliminarily assess its future effects on the Mexican economy. Essentially, the reform replaces a pay-as-you-go system with a fully funded defined-contribution system based on individual accounts with a minimum pension guaranteed by the government. Total contributions to the individual accounts will amount to 13.5 percent of salary for the average worker, plus 2.5 percent for disability and life insurance that still will be managed by the government's Social Security Institute (IMSS). The new Mexican system will result in lower administrative costs by: limiting the number of transfers between pension fund managers to one per year; allowing pension managers to operate several funds; not establishing a minimum guaranteed rate of return for pension funds; and providing a centralized agency for collecting contributions. Among its disadvantages are: the prohibition against funds investing in foreign securities; the IMSS being the sole provider of disability and life insurance; limits on the market share; and portability problems. Still, the fiscal cost of transition to the new system is relatively low compared to similar reforms in other Latin American countries, and the Mexican reform is expected to have a significant effect on financial savings.

The Argentine government replaced the pay-as-you-go public social security regime with a system combining public and private administration that began operating in July 1994. **Cottani** and **Demarco** analyze the problems of the old regime that led to the reform, and characterize the structure of the new system. Their projections of the public provisional deficit, and of the pension funds for the next three decades, provide the basis for a final discussion about the expected macroeconomic effects of the new system, particularly those associated with the domestic saving rate of the economy.

At dinner, three members of the current U.S. Social Security Advisory Council—**Gramlich, Weaver,** and **Schieber**—described the council and its work. Over the past several years, the council has reviewed various options for bringing the Social Security system into actuarial balance. Current projections indicate that the OASDHI system will be bankrupt by 2030 unless changes are made. Council members are now split among three plans. The first plan would reduce benefits slightly but maintain current tax rates. The remaining gap would be closed by investing some of the Social Security trust fund in equities. The second plan would scale back benefits further in order to bring the system into balance without raising payroll tax rates. To supplement the reduced benefits, the plan requires each worker to contribute to a new defined-contribution plan with individual accounts, similar to TIAA–CREF or the Federal Thrift Plan. The third plan would create Personal Savings Accounts (PSAs). Under this two-tiered plan, 7.4 percent of the 12.4 percent payroll tax would provide a flat dollar payment for a worker with a full lifetime employment record. The remaining 5 percent of the payroll tax would be invested in private savings accounts. Withdrawals from PSAs would be allowed at age 62; benefits could be included in estates, and annuitization would not be required at retirement. The PSA plan also includes a 1.5 percent payroll tax supplement for the next 70 years to pay for the transition to this new system, and would require $600 billion of additional borrowing.

In discussing the three plans, **Weaver** noted that it is remarkable that more than half of the council members support one of the two plans that include individual savings accounts. She said that few of the council members began the process expecting to support privatization of Social Security. But, after studying the alternatives, a majority decided that partial privatization looks like the most appealing option.

Feldstein and **Samwick** report their calculations of a feasible transition from the existing U.S. Social Security system to a system based on Mandatory Individual Retirement Accounts (MIRAs). A gradual transition that maintains the same benefits that could be paid with the current 12.4 percent payroll tax would raise

the current payroll tax rate by less than 1.5 percentage points (to a maximum of 13.7 percent in 2007). By 2019, the payroll tax would be lower than 12.4 percent. Because of the high return on a fully funded plan, the 12.4 percent payroll tax eventually could be replaced by a payroll tax of only 2.1 percent while maintaining the same long-term benefits that would have been paid with the 12.4 percent tax. They also discuss how a MIRA system could deal with the problem of low-income employees and with the risks associated with uncertain longevity and fluctuating market returns.

Kotlikoff finds that privatizing Social Security can generate major long-run increases in output and living standards. Further, although the long-run gains are larger if privatization redistributes resources from initial to future generations, the pure efficiency gains from privatization are also substantial.

Proposals for mandatory private saving accounts differ in the degree of investment discretion that they provide to individual savers, and in their provisions for annuitization of accumulated assets. **Poterba** and **Wise** draw on the existing experience with 401(k) and related plans to provide evidence on these issues. They find that the share of 401(k) plan assets held in corporate equities has increased substantially in recent years. They also learn that the education and income level of participants are related to asset allocation decisions, with less-educated and lower-income participants less inclined to invest in equity securities. A unique survey of TIAA–CREF participants also provides some evidence on the purchase of annuities, another aspect of privatization plan design.

Gustman and **Steinmeier** investigate individual responses to a simple scheme for privatizing Social Security. They explore the sensitivity of outcomes to how individuals project life expectancy and value spouse and survivor benefits, and to expected future reductions in Social Security benefits. Depending on assumptions made, first-year participation ranges from 20 percent to almost 100 percent. Estimated paths for taxes over time decline immediately with privatization, but the decline in benefits grows slowly over a period of two or three decades. Labor force participation rates are not affected greatly by privatization, even if major changes in pensions are induced.

Mitchell collects and analyzes information on the expenses associated with public versus private retirement systems. She also examines the costs of the U.S. Social Security system, comparing it to national systems from other countries. Mitchell finds that the administration costs of publicly run social security systems vary greatly across countries and institutional settings. A key factor influencing costs is scale: plans with more assets and more participants are less expensive to administer. She concludes that privately managed old-age retirement programs will be somewhat more costly to operate than current publicly managed programs, depending on the specific design of the programs. Nevertheless, she expects these costs to be accompanied by new services for participants.

The proceedings of this conference will be published by the University of Chicago Press. The release of this volume will be announced in a future issue of the *Reporter*.

Bureau News

1996 Summer Institute

Over 900 economists from 227 universities and organizations around the world attended the NBER's 18th annual Summer Institute. This year's program was funded primarily by a grant from the Lynde and Harry Bradley Foundation, with additional support from the National Science Foundation and the National Institute on Aging. The papers presented at 30 different sessions covered a wide variety of topics. A list of all papers and work in progress can be obtained by writing to: Summer Institute Catalogue, NBER, 1050 Massachusetts Avenue, Cambridge MA 02138-5398.

Economic Fluctuations and Growth

Nearly 150 members and guests of the NBER's Program on Economic Fluctuations and Growth met in Cambridge on July 13. Andrew B. Abel, NBER and University of Pennsylvania, and Kenneth D. West, NBER and University of Wisconsin, organized this program:

Jeremy Greenwood, University of Rochester, and
Mehmet Yorukoglu, University of Chicago, "1974"
Discussant:
Joel Mokyr, Northwestern University

Simon Gilchrist, Boston University, and
John Williams, Federal Reserve Board, "Putty-Clay and Investment: A Business Cycle Analysis"
Discussant:
Thomas Cooley, University of Rochester

Mark Bils, NBER and University of Rochester, and
James Kahn, University of Rochester, "What Inventory Behavior Tells Us About Business Cycles"
Discussant:
Valerie A. Ramey, NBER and University of California, San Diego

Jeffrey A. Frankel and
David H. Romer, NBER and University of California, Berkeley, "Trade and Growth: An Empirical Investigation" (NBER Working Paper No. 5476)
Discussant:
Steven N. Durlauf, NBER and University of Wisconsin

Daniel Levy, Emory University; and
Mark Bergen,
Shantanu Dutta, and
Robert Venable, University of Chicago, "On the Magnitude of Menu Costs: Direct Evidence from Large U.S. Supermarket Chains"
Discussant:
Robert E. Hall, NBER and Stanford University

Robert J. Shiller, NBER and Yale University, "Why Do People Dislike Inflation?" (NBER Working Paper No. 5539)
Discussant:
Stanley Fischer, International Monetary Fund

Greenwood and **Yorukoglu** ask whether 1974 was a watershed year: it saw an increase in the rate of technological change in the production of new equipment; it also signaled the beginning of a sharp rise in income inequality, and of the productivity slowdown. The authors ask whether these phenomena were related, and whether they might have been the result of an industrial revolution associated with the introduction of information technologies.

Gilchrist and **Williams** develop a business cycle model based on the putty-clay technology introduced by Johansen (1959). The putty-clay model fits the observed pattern of forecastable comovements of labor, output, consumption, and investment much better than an equivalent model based on the standard neoclassical production technology. Their model also provides a much stronger propagation mechanism for shocks to technology and relative prices.

Bils and **Kahn** argue that the behavior of manufacturing inventories provides evidence against models of business cycle fluctuations based on productivity shocks, increasing returns to scale, or favorable externalities, while supporting models with short-run diminishing returns and procyclical work effort. Both finished goods and work-in-progress inventories move proportionally much less than sales or production over the business cycle. The authors can explain the cyclical behavior of inventory holdings by allowing for procyclical work effort, the cost of which is internalized by firms but is not reflected contemporaneously in measured wage rates.

Frankel and **Romer** construct measures of the geographic component of countries' trade, and use those measures to obtain instrumental-variables estimates of the effect of trade on income. Their results suggest that ordinary-least-square estimates understate the effects of trade, and that trade has a quantitatively large, significant, and robust positive effect on income.

Levy, Bergen, Dutta, and **Venable** provide direct macroeconomic evidence on the actual magnitude of menu costs for four large U.S. retail supermarket chains. They show that in these establishments, changing prices is a complex process, requiring dozens of steps and a lot of resources: the menu costs in these chains range from $91,416 to $114,188 annually per store, for an average of $105,687. Menu costs comprise 0.7 percent of revenues, 2.8 percent of gross margins, and 35.2 percent of the net margins of these chains. Additional evidence from these chains suggests that these menu costs may be a barrier to certain cost-based price changes.

Shiller conducted a survey of how people think about inflation, and what real problems they see it causing. With results from 677 people, he compared people in the United States, Germany, and Brazil; the young and the old; and economists and noneconomists. The most striking differences among the groups studied were between economists and noneconomists. There were also important international and intergenerational differences. The U.S.–Germany differences (on questions not simply about information) were usually less strong than the intergenerational differences.

Science and Technology Policy

Over 40 academic, government, and industry economists met in Cambridge on August 14 as part of the NBER's project on science and technology policy. Adam B. Jaffe, NBER and Brandeis University, Paul M. Romer, NBER and Stanford University, and David Mowery, University of California, Berkeley, organized this program:

Scott Wallsten, Stanford University, "The Small Business Innovation Research Program: Encouraging Technological Innovation and Commercialization in Small Firms?"
Discussant:
Joshua Lerner, Harvard University

William J. Spencer, Sematech, discussed "Sematech International Collaborations"

Lynne G. Zucker and **Michael R. Darby,** NBER and University of California, Los Angeles, "The Diffusion of Biotechnology in Japan: Scientists, Institutions, and Firms"
Discussant:
Scott Stern, NBER and MIT

Wesley Cohen, Carnegie–Mellon University, and **Lucien Randazzese,** Harvard University, "Eminence and Enterprise: The Impact of Industry Support on the Conduct of Academic Research in Science and Engineering"
Discussant:
Michael S. Fogarty, Case Western Reserve University

Richard Nelson, Columbia University, "A Preliminary Report on University Inventing"
Discussant:
Adam B. Jaffe

Francis Narin, CHI Research, Inc., "Linkage Between Basic Research and Patented Technology"
Discussant:
David Austin, Resources for the Future

The Small Business Innovation Research (SBIR) Program now awards close to $1 billion in R and D grants to small firms each year. **Wallsten** analyzes the program using a new dataset of awardees, firms that applied to the program and were rejected, and eligible firms that never applied to the program. He finds that: multiple awards per firm are common; older, larger, and more patent-intensive firms win more awards; awardees go on to receive more patents than rejected firms do; winning awards does not seem to be correlated with increased sales or employment; and, based on a sample of public firms, there is a substantial, almost dollar-for-dollar, crowd-out effect. That is, firms that receive SBIR grants seem to reduce their other R and D expenditures by an amount almost equal to the award.

The continuing improvement of computers, telecommunications, and in fact all modern electronics, is attributable to the amazing productivity growth in the manufacture of silicon integrated circuits: 25–30 percent per year for nearly three decades. Part of these productivity gains were the result of the ever-increasing diameter of silicon wafers, from 30mm in 1965 to 200mm today, and probably to 300mm by the year 2000. The cost of converting from 200mm to 300mm wafers will be far more than any single company can afford. Therefore, two cooperative efforts are under way, aimed at developing 300mm manufacturing capability: I300I (International 300mm Initiative) involving a total of 13 semiconductor manufacturers from the United States, Europe, Korea, and Taiwan; and Selete (Semiconductor Leading Edge Technologies Inc.), which consists of 10 Japanese members. **Spencer** compares the two in terms of their objectives, scope, membership, funding, and methodology. He then considers the policy implications of the I300I international cooperation in the areas of trade, tariffs, intellectual property, and the role of government funding.

Zucker and **Darby** report on the relationship between births of new biotechnology enterprises (NBEs) in Japan and "stars" and other variables. They find much the same process at work in Japan as in the United States. However, star scientists in

Japan induce entry of significantly fewer NBEs there than in the United States. Three major factors in Japan interact to deter the formation of new biotechnology firms (NBFs): 1) the closed nature of the Japanese system of higher education and noncompetitive research funding; 2) incompleteness of the capital markets, especially the lack of a national venture capital industry capable of financing new firms, and the related absence of initial public offerings prior to a firm's achieving substantial profitability; and 3) cultural characteristics and incentive systems that discourage Japanese entrepreneurship generally, and affect scientists in particular. Zucker and Darby conclude that these factors explain both the low level of NBF formation and the smaller impact of intellectual capital on resources on the births of NBEs.

Since the early 1980s, ties between industry and academic research have deepened. There is a concern that those deepening ties may lead to less basic research being conducted and to limitations on the disclosure of academic research. **Cohen** and **Randazzese** examine the effects of deepening ties between industry and academia on university research by developing a model of university–industry research relationships and testing it with data from a 1991 survey of directors of university–industry research centers in the United States.

Nelson reports on a research project, still in its early stages, aimed at describing the inventing going on in U.S. research universities since the passage of the 1980 Bayh–Dole Act. The author is interested in the kinds of inventions being made, where in the university they are occurring, and the sources of funding for the efforts that lead to inventing. He plans to study the firms that are drawing on university inventing to determine their industries and whether they are typically big or small, and to learn what kind of inventions are taken up by firms in the vicinity of the university. The author is especially interested in what the new incentive regime launched by Bayh–Dole is doing to the nature of research at universities, and to the university culture more broadly.

According to **Narin,** there has been a *threefold* increase in linkage between patented technology and the research science base over the six years separating 1987/8 and 1993/4. The number of front-page citations to U.S.-authored research papers in SCI-covered journals has increased from 16,607 to 49,510 over the six years. Second, a large fraction of these papers cited in patents originate in the U.S. university system, and are funded by U.S. research support agencies. Specifically, for the 1993 data, approximately 67 percent of the cited U.S. papers have at least one author from a university. Of these U.S. university papers, approximately 68 percent acknowledged support from one or more government agencies. Thus, university research in the United States, supported by the U.S. governmental agencies, is a major source of the research that underlies patented industrial technology.

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NBER Working Papers

Entry and Predation: British Shipping Cartels, 1879–1929

Fiona Scott Morton

NBER Working Paper No. 5663
July 1996
JEL Nos. L92, L12
Industrial Organization

I examine the outcomes of cases of entry by merchant shipping lines into established markets around the turn of the century. These established markets are dominated completely by an incumbent cartel composed of several member shipping lines. The cartel decides whether or not to begin a price war against the entrant; some entrants are admitted formally to the cartel without any conflict. I use characteristics of the entrant to predict whether or not the entrant will encounter a price war conditional on entering. I find that weaker entrants are fought, where "weaker" means having fewer financial resources, less experience, being smaller, or having poor trade conditions. My empirical results support the "long purse" theory of predation. I discuss qualitative evidence, such as predatory intent expressed in correspondence between cartel members, which supports the empirical results. The results are also robust to misclassification of the dependent variable, which is a particular concern when dealing with historical data.

Where Are We in the Economics of Gender? The Gender Pay Gap

Francine D. Blau

NBER Working Paper No. 5664
July 1996
JEL Nos. J16, J31
Labor Studies

Empirical research on gender pay gaps traditionally has focused on the role of gender-specific factors, particularly gender differences in qualifications and in the treatment of otherwise equally qualified male and female workers (that is, labor market discrimination). This paper explores the determinants of the gender pay gap and argues for the importance of an additional factor: wage structure, that is the array of prices set for labor market skills and the rewards received for employment in favored sectors. Drawing on joint work with Lawrence Kahn, I illustrate the impact of wage structure by presenting empirical results on its effect on international differences in the gender gap, and on trends over time in the gender differential in the United States.

Changes in U.S. Tariffs: Prices or Policies?

Douglas A. Irwin

NBER Working Paper No. 5665
July 1996
JEL Nos. F13, N72
International Trade and Investment, Development of the American Economy

In the century after the Civil War, roughly two-thirds of U.S. dutiable imports were subject to specific duties with ad valorem equivalents related inversely to the price level. This paper finds that import price fluctuations easily dominate commercial policies (for example, changes in rates of import duty) in bringing about changes in the average U.S. tariff from 1865–1973. About three-quarters of the post–Smoot–Hawley decline in U.S. tariffs, for example, can be attributed to higher import prices, and the remainder to negotiated reductions in tariff rates.

Exclusive Dealing

B. Douglas Bernheim and Michael D. Whinston

NBER Working Paper No. 5666
July 1996
JEL No. L42
Industrial Organization

We provide a conceptual framework for understanding the phenomenon of exclusive dealing, and we explore the motivations for and effects of its use. For a broad class of models, we characterize the outcome of a contracting game in which manufacturers may employ exclusive dealing provisions in their contracts. We then apply this characterization to a sequence of specialized settings. We demonstrate that exclusionary contractual provisions may be irrelevant, anticompetitive, or efficiency-enhancing, depending upon the setting. More specifically, we demonstrate the potential for anticompetitive effects in *noncoincident* markets (that is, markets that do not practice exclusive dealing). We also explore the potential for the enhancement of efficiency in a setting in which common representation gives rise to incentive conflicts. In each instance, we describe the manner in which equilibrium outcomes would be altered by a ban on exclusive dealing. We demonstrate that a ban may have surprisingly subtle and unintended effects.

The Determinants and Consequences of Financial Education in the Workplace: Evidence from a Survey of Households

B. Douglas Bernheim and Daniel M. Garrett

NBER Working Paper No. 5667
July 1996
JEL Nos. H31, I21
Aging, Public Economics

In recent years, there has been significant growth in programs of financial and retirement education in the U.S. workplace. This phenomenon provides an opportunity for assessing the effects of targeted education programs on financial choices. We use a novel household survey to develop econometric evidence on the efficacy of employer-based financial education. While our primary focus is on the effects of these programs on saving (both in general and for retirement purposes), we also examine a number of collateral issues. These include the circumstances under which employers offer, and employees participate in, financial education programs, and the effects of these programs on sources of information and advice concerning retirement planning. We find that employer-based retirement education strongly influences household financial behavior.

International R and D Spillovers: A Reexamination

Frank R. Lichtenberg and Bruno Van Pottelsberghe de la Potterie

NBER Working Paper No. 5668
July 1996
JEL Nos. F10, O30, O40
Productivity

Coe and Helpman (1995) have measured the extent to which technology spills over between industrialized countries through the particular channel of trade flows. This paper reexamines two particular

features of their study. First, we suggest that their functional form of how foreign R and D affects domestic productivity via imports is probably incorrect. We provide an alternative model that turns out to be more accurate, both theoretically and empirically.

Second, we take into account two new potential channels of technology transfer: inward foreign direct investment (FDI) and technology sourcing, as proxied by outward FDI. We show that outward FDI flows and imports flows are simultaneous channels through which technology is diffused internationally. Inward FDI flows are not a significant channel of technology transfer. The hypothesis of technology sourcing associated with multinational enterprises' activities abroad therefore is confirmed, while the widespread belief that inward FDI is a major channel of technology transfer is rejected.

An Empirical Examination of Information Barriers to Trade in Insurance

John Cawley and Tomas Philipson

NBER Working Paper No. 5669
July 1996
JEL Nos. D8, G22, H55
Health Care

This paper tests restrictions implied by the canonical theory of insurance under asymmetric information using data that contain the self-perceived and actual mortality risk of individuals, as well as the price and quantity of their life insurance.

We report several findings that are hard to reconcile with the canonical theory. First, we find that self-perceived risk is strikingly independent of the price of insurance. We also find the opposite type of nonlinear pricing from what is predicted by the theory: the theory predicts that prices rise with quantity, but we find that they fall. Third, we find that risk is correlated negatively with the quantity of insurance purchased, although the theory predicts a positive correlation. We find too that a substantial fraction of individuals hold multiple insurance contracts; this casts doubt on the prediction that unit prices rise with quantity, because multiple small contracts dominate a large one. Finally, we test the accuracy of the self-perceived risk of the insured by estimating the induced profits that it implies. We conclude by discussing the robustness of these results and the questions they raise for future theoretical models.

Application of Nationality-Adjusted Net-Sales-and-Value-Added Framework: The Case of Japan

Fukunari Kimura and Robert E. Baldwin

NBER Working Paper No. 5670
July 1996
JEL No. F1
International Trade and Investment

This paper applies to Japan the nationality-adjusted net-sales-and-value-added framework proposed in Baldwin and Kimura (1996). Despite possibly large estimation errors caused by statistical deficiencies, the framework is very useful for analyzing the relationship of the Japanese economy to the world economy. We find that Japan is special in four aspects: First, Japanese-owned firms have become increasingly dependent on the marketing activities of their foreign affiliates, rather than depending on cross-border exports by parent firms located in Japan. Second, the much smaller activities of Japanese affiliates of foreign firms relative to those of foreign affiliates of Japanese firms (FAJF) are apparent in terms of sales, value added, and employment, at both the macroeconomic and sectoral levels. Third, Japanese net sales to foreigners are consistently larger than cross-border net exports of Japan. Fourth, among the activities of FAJF, the importance of commercial FAJF is particularly large; these commercial FAJF handle a large portion of Japanese exports and imports. We conclude by discussing a number of statistical improvements required by the Japanese government in order to apply our analytical framework more rigorously.

Earnings and Expected Returns

Owen Lamont

NBER Working Paper No. 5671
July 1996
JEL No. G12
Asset Pricing

The aggregate dividend payout ratio forecasts the aggregate excess returns on stocks and corporate bonds in postwar U.S. data. Both high corporate profits and high stock prices forecast low excess returns on equities. When the payout ratio is high, the expected returns are high. The payout ratio's correlation with business conditions gives it predictive power for returns; it contains information about future stock and bond returns that is not captured by other variables. The payout ratio is useful because it captures the temporary components of earnings. The dynamic relationship among dividends, earnings, and stock prices shows that a positive innovation in earnings lowers expected returns in the near future, but raises them thereafter.