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In This Issue

Program Report

Monetary Economics

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The NBER Program in Monetary Economics, established in 1991, encourages practical research in macroeconomics with an emphasis on issues relating to monetary policy. Its goal is to promote a greater understanding of the relationship between central-bank actions and the economy in order to help the world's central bankers better meet the formidable challenges they face. Toward these ends, program members pursue a range of individual and collaborative research studies. Program members and their guests meet twice a year to present and discuss this research. In addition, members meet for one week during the NBER's Summer Institute to present recent research and collaborate on research in progress. Central bankers regularly are invited to attend these meetings and discuss their recent decisions and concerns. Over the past several years, program members have heard from Federal Reserve Governors Lawrence B. Lindsey and Janet L. Yellen; then President of the Federal Reserve Bank of Boston Richard Syron; then Governor of the Bank of Canada John Crow; former President of the Bundesbank Helmut Schlesinger; and the Bank of England's Chief Economist Mervyn A. King, among others.

In addition to regular program meetings and the Summer Institute, the monetary economics program sponsors occasional conferences to focus research on specific topics. I ran the last such conference, which produced a recently published University of Chicago Press volume entitled *Monetary Policy*. Christina D. Romer and David M. Romer currently are organizing the next conference, which will focus on policymaking in low-inflation countries.

Research by program members is diverse. It includes empirical and theoretical work on the effects of monetary policy and the study of alternative policies and institutional arrangements. What follows is a brief description of some avenues of research that program members have been pursuing over the past several years.

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The Effects of Monetary Policy

When the central bank changes the quantity of money, what is the effect on the economy? Although this question is at the heart of monetary economics, the answer is neither easy to obtain nor widely agreed upon. From a scientific point of view, the fundamental problem is that central banks do not conduct controlled experiments. If central banks randomized their actions, we could just observe what happened to the economy after these actions in order to see their effects. But, in fact, central banks most often act in response to actual, perceived, or anticipated events. Thus, researchers studying monetary policy confront the difficult task of sorting out the effects of central-bank actions from the causes of those actions.

Monetary economists have tried to solve this problem in two ways. One is to take a narrative approach to monetary history. This approach dates back at least to Milton Friedman and Anna J. Schwartz's classic treatise, *A Monetary History of the United States*. This NBER-sponsored study examined in detail the causes and effects of major monetary changes over the previous century, with an emphasis on historical and institutional detail. More recently, Romer and Romer have extended this narrative approach. They used the minutes of Federal Open Market Committee meetings to pinpoint dates at which the Fed changed policy toward a tougher stance on inflation. The Romer and Romer dates, as they have come to be called, provide one concrete albeit controversial method for studying the effects of changes in monetary policy.[1]

A second way of trying to disentangle the causes and effects of monetary policy is to take a more econometric approach. That is, rather than relying on a careful reading of history, one can study the effects of monetary policy by applying time-series analysis to macroeconomic data. To make this approach work, some identifying assumption is necessary to sort out cause and effect. One might assume, for instance, that changes in short-term interest rates not explicable by other macroeconomic variables reflect changes in the preferences of the central bank toward inflation. Arguably, this change represents an essentially random change in policy. Once such an identifying assumption is made, one can use macroeconomic data to trace out the effects of monetary shocks over time. One drawback of this econometric approach is that it relies on identifying assumptions that are usually open to dispute. On the other hand, compared to the narrative approach, the econometric approach asks for less subjective judgment on the part of the researcher, which increases the verifiability of the results and reduces the possibility of inadvertent bias.[2]

Banks and the Monetary Transmission Mechanism

In recent years, much effort has been devoted to reexamining the monetary transmission mechanism—the way in which central-bank actions affect the aggregate demand for goods and services. According to conventional theory, monetary policy affects aggregate demand primarily through interest rates. When the central bank reduces the quantity of money through open-market operations, for instance, interest rates rise to equilibrate the demand for money with the reduced supply. Higher interest rates, in turn, reduce investment, as the higher cost of borrowing discourages some potential investors. In addition, higher interest rates depress asset values, such as the prices of equities, which reduces household wealth and consumer spending, Thus, when the central bank reduces the money supply and raises interest rates, it reduces consumption and investment and, thereby, the aggregate demand for goods and services. In the long run this reduced demand leads to lower inflation, but in the short run it also depresses the levels of production and employment.

Or so goes the conventional wisdom. Recently, a group of economists has suggested that this story of the monetary transmission mechanism is incomplete at best, for it ignores the key role of bank lending. According to this new view, called the lending view, when the central bank conducts open-market operations to reduce the supply of money, it drains reserves from the banking system, which in turn forces banks to reduce lending. This reduced capacity of the banking system to make loans provides another reason, in addition to higher interest rates, that investment falls after a monetary contraction. According to this lending view, a monetary contraction has an especially strong impact on those investors who are bank-dependent. Small firms, for instance, have limited ability to finance investment through other means, such as the issuance of stocks or bonds, and have limited cash flow to finance investment through retained earnings. When the central bank reduces bank reserves and causes a contraction in bank lending, these bank-dependent firms have little choice but to reduce investment spending.

There remains considerable controversy about how much this new lending view adds to our understanding of the monetary transmission mechanism. Various questions remain open to dispute. When bank lending falls after a monetary contraction, as indeed it does, how much of the fall is attributable to reduced supply because of the fall in reserves and how much is attributable to reduced demand because of the overall economic contraction? When the banking system finds itself short of reserves, to what extent can it make loans in other ways, such as by selling government securities or issuing nonreservable certificates of deposit? When firms find themselves unable to obtain bank loans, to what extent are they able to borrow in other ways, such as through finance companies or trade credit? These and many related questions have provided a fertile area of research for members of the monetary economics program.[3]

Short-Run Price Adjustment

According to conventional monetary theory, changes in the quantity of money have important effects on production and employment over a period of several years, but these effects dissipate over time. This distinction between the short-run and long-run effects of monetary policy rests on the assumption that wages and prices respond differently over different time horizons. Over short periods of time, wages and prices are relatively sticky; this inability to respond fully to changes in the quantity of money induces changes in real economic activity. Over long periods of time, wages and prices can respond to changing circumstances, so changes in the quantity of money have little effect on production and employment.

Thus, understanding the dynamic effects of monetary policy requires an understanding of how wages and prices adjust over time. Much research in the monetary economics program is aimed at this topic. Some of this work tries to build theories that explain how firms choose to adjust prices. Other work examines data on prices, sometimes at the economywide level and sometimes at the level of individual firms, in order to evaluate these theories and to shed light on actual price adjustment.[4]

Policy Design, Rules, Institutions, and History

Economists who study monetary economics are motivated by more than the intrinsic intellectual interest of the field. To a large extent, their goal is to provide a greater understanding of the economy in order to improve the conduct of monetary policy. Thus, much work in the NBER monetary economics program is aimed at evaluating alternative approaches to policymaking at the world's central banks.

Some of this work considers the effects of various policy rules. A monetary policy rule is a type of contingency plan for the central bank: it specifies how the central bank will respond to changing economic circumstances. Policy rules are of interest for two reasons. First, some economists have advocated reduced reliance on discretion and greater reliance on rules in order to reduce the political pressure and inflationary bias often considered inherent in discretionary policy. Second, even if a central bank maintains its discretionary powers, it can use policy rules as guidelines when choosing how to exercise those powers.

There are a large number of possible policy rules from which a central bank might choose. A policy rule long advocated by some economists is a target path for a monetary aggregate, such as M2 or the monetary base. Another possibility is an adjustable target path for a monetary aggregate, where the adjustments occur according to some formula as the central bank collects new information about the velocity of money. Another possible rule is a target path for nominal income, perhaps implemented using the consensus of private-sector forecasts of nominal income. Research can shed light on the pros and cons of these and other rules, for instance by simulating how history might have been different if one of these rules had been in effect.[5]

Closely related to the study of policy rules is the study of institutional design. It is now widely accepted that central banks with greater independence from the government tend to produce less inflation than central banks with close governmental ties. This fact raises many questions. Are independent central banks less inflationary because they care less about short-run fluctuations in production and employment? Are their policy choices less affected by upcoming elections and other political considerations? Are they more likely to follow policy rules? Do the lower rates of inflation of independent central banks affect long-run growth rates? Which of the many institutional features of independent central banks are most important? These and the many related questions have been the subject of much recent research.[6]

The most direct way in which research sheds light on monetary policy is by studying the policies of the past. Thus, monetary economics is tied inextricably to monetary history. As noted earlier, the NBER has a strong tradition in the narrative approach, including the classic work of Friedman and Schwartz and the more recent work of Romer and Romer. The monetary economics program also includes many other researchers examining historical monetary policies, from the most recent recession to the policies and institutions of centuries past.[7]

Overall Philosophy

The NBER monetary economics program is eclectic in the best sense of the word. It embraces high-quality research on monetary policy and related issues, both theoretical and applied, from a variety of perspectives. Members of the program often disagree with one another. Indeed, it is the disagreements that lead to debate, research, and, ultimately, progress in economic science.

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[1]*See M. Friedman and A. J. Schwartz,* A Monetary History of the United States, 1867–1960, *Princeton: Princeton University Press, 1963; C. D. Romer and D. H. Romer, "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz," in* Macroeconomics Annual, Volume 4, *O. J. Blanchard and S. Fischer, eds. Cambridge: MIT Press, 1989; and M. D. Shapiro, "Federal Reserve Policy: Cause and Effect," NBER Reprint No. 1925, December 1994, and in* Monetary Policy, *N. G. Mankiw, ed. Chicago: University of Chicago Press, 1994.*

[2]*For some recent econometric studies of the effects of monetary policy, see R. G. King and M. W. Watson, "Testing Long-Run Neutrality," NBER Working Paper No. 4156, September 1992; T. Konishi, V. A. Ramey, and C. W. J. Granger, "Stochastic Trends and Short-Run Relationships Between Financial Variables*

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[3] *For an overview of the literature on the lending view, see A. K. Kashyap and J. C. Stein, "Monetary Policy and Bank Lending," NBER Working Paper No. 4317, April 1993, and in* Monetary Policy, *op. cit. For other recent work in this area, see A. K Kashyap, O. A. Lamont, and J. C. Stein, "Credit Conditions and the Cyclical Behavior of Inventories: A Case Study of the 1981–2 Recession," NBER Working Paper No. 4211, November 1992, and* Quarterly Journal of Economics *109, 3 (1994); V. A. Ramey, "How Important Is the Credit Channel in the Transmission of Monetary Policy?" NBER Working Paper No, 4285, March 1993, and* Carnegie–Rochester Series on Public Policy *(Fall 1993); J. A. Miron, C. D. Romer, and D. N. Weil, "Historical Perspectives on the Monetary Transmission Mechanism," NBER Reprint No. 1931, January 1995, and in* Monetary Policy, *op. cit.; C. D. Romer and D. H. Romer, "Credit Channel or Credit Actions? An Interpretation of the Postwar Transmission Mechanism," NBER Reprint No. 1880, June 1994; A. K. Kashyap and J. C. Stein, "The Impact of Monetary Policy on Bank Balance Sheets," NBER Working Paper No. 4821, August 1994, and* Carnegie–Rochester Conference on Public Policy, *forthcoming; R. G. Hubbard, "Is There a Credit Channel for Monetary Policy?" NBER Working Paper No. 4977, December 1994, and* Federal Reserve Bank of St. Louis Review *(May/June 1995); and B. S. Bernanke and M. Gertler, "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," NBER Working Paper No. 5146, May 1995.*

[4] *For some recent work on price adjustment, see A. S. Blinder, "On Sticky Prices: Academic Theories Meet the Real World," in* Monetary Policy, *op. cit.; L. M. Ball and N. G. Mankiw, "Relative Price Changes as Aggregate Supply Shocks," NBER Reprint No. 1961, March 1995; M. F. Bryan and S. G. Cecchetti, "Measuring Core Inflation," NBER Working Paper No. 4303, March 1993, and in* Monetary Policy, *op. cit.; L. M. Ball, "What Determines the Sacrifice Ratio?" NBER Working Paper No. 4306, March 1993, and in* Monetary Policy, *op. cit.; L. M. Ball and N. G. Mankiw, "A Sticky-Price Manifesto," NBER Working Paper No. 4677, March 1994, and* Carnegie–Rochester Conference Series on Public Policy, *forthcoming; B. T. McCallum, "A Semiclassical Model of Price Level Adjustment," NBER Working Paper No. 4706, April 1994; S. Basu, "Intermediate Goods and Business Cycles: Implications for Productivity and Welfare," NBER Working Paper No. 4817, August 1994; A. K. Kashyap, "Sticky Prices: New Evidence from Retail Catalogs," NBER Working Paper No. 4855, September 1994, and* Quarterly Journal of Economics *110, 1 (1995); J. J. Rotemberg, "Prices, Output, and Hours: An Empirical Analysis Based on a Sticky Price Model," NBER Working Paper No. 4948, December 1994; and M. S. Kimball, "The Quantitative Analytics of the Basic Neomonetarist Model," NBER Working Paper No. 5046, February 1995.*

[5] *For some work discussing monetary policy rules, see M. Feldstein and J. H. Stock, "The Use of Monetary Aggregates to Target Nominal GDP," NBER Working Paper No. 4304, March 1993, and in* Monetary Policy, *op. cit.; R. E. Hall and N. G. Mankiw, "Nominal Income Targeting," NBER Reprint No. 1916, October 1994, and in* Monetary Policy, *op. cit.; M. Woodford, "Nonstandard Indicators of Monetary Policy: Can Their Usefulness Be Judged from Forecasting Regressions?" in* Monetary Policy, *op. cit.; B. T. McCallum, "Specification and Analysis of a Monetary Policy Rule for Japan," NBER Reprint No. 1854, March 1994, and* Bank of Japan Monetary and Economic Studies *1, 2 (November 1993); B. M. Friedman, "The Role of Judgment and Discretion in the Conduct of Monetary Policy: Consequences of Changing Financial Markets," NBER Reprint No. 1889, June 1994; B. T. McCallum, "Monetary Policy Rules and Financial Stability," NBER Working Paper No. 4629, January 1994; M. D. Bordo and A. J. Schwartz, "The Specie Standard as a Contingent Rule: Some Evidence for Core and Peripheral Countries, 1880–1990," NBER Working Paper No. 4860, September 1994; and S. G. Cecchetti, "Inflation Indicators and Inflation Policy," NBER Working Paper No. 5161, June 1995.*

[6] *For some of the recent work on central bank independence, see B. Eschweiler and M. D. Bordo, "Rules, Discretion, and Central Bank Independence: The German Experience, 1880–1989," NBER Working Paper No. 4547, November 1993, and in* Varieties of Monetary Reform: Lessons and Experience on the Road to Monetary Union, *P. Siklos, ed. Boston: Kluwer Academic Publishers, 1994; S. Fischer, "Modern Approaches to Central Banking," NBER Working Paper No. 5064, March 1995; and B. T. McCallum, "Two Fallacies Concerning Central Bank Independence," NBER Working Paper No. 5075, March 1995.*

[7] *For some of the recent work on monetary history, see C. W. Calomiris, "Greenback Resumption and Silver Risk: The Economics and Politics of Monetary Regime Change in the United States, 1862–1900," NBER Working Paper No. 4166, September 1992; M. D. Bordo, "The Gold Standard, Bretton Woods, and Other Monetary Regimes: An Historical Appraisal," NBER Reprint No. 1818, October 1993, and in* Federal Reserve Bank of St. Louis Review *75, 2 (March/April 1993); M. Feldstein, "Monetary Policy and Inflation in the 1980s: A Personal View," NBER Working Paper No. 4322, April 1993, and in* American Economic Policy in the 1980s, *M. Feldstein, ed. Chicago: University of Chicago Press, 1993; M. D. Bordo, E. U. Choudhri, and A. J. Schwartz, "Could Stable Money Have Averted the Great Contraction?" NBER Working Paper No. 4481, October 1993; C. M. Betts, M. D. Bordo, and A. Redish, "A Small Open Economy in Depression: Lessons from Canada in the 1930s," NBER Working Paper No. 4515, November 1993; M. D. Bordo, H. T. Rockoff, and A. Redish, "A Comparison of the United States and Canadian Banking Systems in the Twentieth Century: Stability Versus Efficiency," NBER*

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Research Summaries

The Role of Banks in the Transmission of Monetary Policy

Anil K Kashyap and
Jeremy C. Stein

Over the last five years, we have been working on the question of how the effects of monetary policy —that is, open market operations —are transmitted to the economy. The principal theme of our work has been that, in order to fully understand the monetary mechanism, one must move beyond traditional macro explanations that emphasize households' relative preferences for "money" and other less liquid assets. In our view, the role of the commercial banking sector is central to the transmission of monetary policy. More specifically, two key factors shape the way in which monetary policy works: the extent to which banks rely on reservable deposit financing, and hence adjust their loan supply schedules in the wake of open market operations; and the extent to which certain borrowers in the economy are "bank-dependent," and therefore cannot offset these Fed-induced shifts in bank loan supply easily. These two factors in turn depend on the details of the financing arrangements available to both banks and nonfinancial firms, so that our research naturally brings together central issues in corporate finance and macroeconomics.

Our key empirical findings can be summarized briefly by the following picture of monetary policy transmission: when the Fed tightens policy, aggregate lending by banks gradually slows down, and there is a surge in nonbank financing (for example, the use of commercial paper). When this substitution of financing is taking place, aggregate investment is cut back (by more than would be predicted solely on the basis of rising interest rates). Small firms that do not have significant buffer stocks of cash are most likely to trim investment (particularly investment in inventory) around the periods of tight money. Similarly, smaller banks seem more prone than large banks to reduce their lending. Overall, the results suggest that monetary policy may have important real consequences, but not because of standard interest rate effects.

Aggregate Patterns

In our first paper, which was coauthored with David Wilcox, we looked at aggregate data. Perhaps the simplest aggregate empirical implication of the bank-centric view of monetary transmission is that banks' loans should be correlated closely with measures of economic activity. In fact, there is a strong correlation between bank loans and unemployment, GNP, and other key macroeconomic indicators, as demonstrated by Bernanke and Blinder.[1] But, in terms of establishing support for a "bank lending channel," such correlations are inconclusive because they could arise even if the lending channel were not operative. For example, it may be that the correlations are driven by changes in the demand for bank loans rather than the supply of bank loans. That is, bank loans and inventories might move together because banks always stand willing to lend, and firms finance desired changes in level of inventories with bank loans.

The main point of the first paper was a way to overcome this fundamental difficulty in separating the role of loan demand from loan supply. Our insight was that movements in substitutes for bank financing should contain information about the demand for bank financing. For example, if bank loans are falling while the issuance of commercial paper is rising, then we infer that the supply of bank loans has contracted.[2] Thus, we examined movements in the "mix" between bank loans and loan substitutes following changes in the stance of monetary policy.[3] Using both the federal funds rate and the Romer and Romer[4] policy proxy as indicators of the stance of monetary policy, we found that when the Fed tightens, the issuance of commercial paper surges while loans (slowly) decline—that is, the change in the mix indicates that loan supply has shifted inward.[5]

Having established that the bank financing mix could be used to infer movements in banks' loan supply, we were able to test whether loan supply affected firms' spending. In other words, we were able to check whether the correlation between lending and spending occurred purely because of movements in loan demand. Our tests boil down to checking whether the proxy for shifts in loan supply has any additional explanatory power for investment once other fundamental factors such as the cost of capital are taken into account. We found that the mix does seem to have independent predictive power for investment, particularly for inventory investment.

While these results based on aggregate data are fairly supportive of a lending channel, there are some important limitations that accompany this type of time-series analysis. For instance, Oliner and Rudebusch[6] claim that the aggregate evidence regarding the substitution between bank loans and commercial paper arises not because of loan supply effects, but rather because of heterogeneity in loan demand. They claim that large firms that typically use commercial paper financing tend to increase *all* forms of borrowing, while smaller firms that are mostly dependent on banks receive less of all types of financing. In Kashyap, Stein, and Wilcox[7] we show that such heterogeneities at best can account only partially for our mix results—very similar results obtain when we restrict our tests to a sample of only large firms. Nonetheless, the basic point that heterogeneity could render the interpretation of our results more ambiguous is valid. Accordingly, in our subsequent research we have designed tests using micro-level data to help clarify the interpretation of the aggregate correlations.

Monetary Policy and Inventories: A Micro Perspective

Perhaps the most exciting aspect of our initial aggregate findings is that they may suggest a link between monetary policy and inventory swings. It is well known that inventory decumulations are large during recessions, and that monetary policy is typically tight prior to recessions. However, the simple story that tight money and high carrying costs lead to inventory runoffs is undermined by another well-known finding: the difficulty in documenting interest rate effects on inventories. Our initial results with Wilcox[8] provide some support for the view that monetary policy and financial factors may be important for inventory movements, even though standard interest rates in the security market do not have much predictive power for inventories.

In our second paper, written with Owen Lamont,[9] we took a micro perspective and compared the differences in inventory investment of publicly traded companies that do and do not have bond ratings. The nonrated companies are typically much smaller than the rated companies, and are likely to be bank dependent. Because of the myriad of evidence suggesting that Federal Reserve policy was restrictive prior to 1982, we began the study with an examination of the 1982 recession. We found that during this episode, the inventory movements of the nonrated companies were much more sensitive to their own cash holdings than were the inventory changes for rated companies. (In fact, there was no significant liquidity effect for the rated companies.)

In contrast, we found that during subsequent periods there was little relationship between cash holdings and inventory movements for the nonrated companies. For instance, during 1985 and 1986, when monetary policy arguably was particularly loose, the correlation between inventory investment and cash holdings was negative and completely insignificant.

These findings further support the view that financial factors beyond those captured by open market interest rates play an important role in shaping the effects of monetary policy on inventory behavior. Related work by Gertler and Gilchrist[10] shows that the same type of results are found when one compares the inventory investment of an aggregated set of large and small firms: the inventory investment of small firms, which a priori should be more susceptible to financing problems, is more sensitive to changes induced by monetary policy than is the investment of large firms.

Monetary Control via the Banking System

While it seems fairly clear that monetary policy derives some of its potency from some form of imperfection in the capital market at the firm level, the precise connection between monetary policy and bank loan supply is less clear. An oft-asked skeptical question is why a Modigliani–Miller type of theorem does not hold for banking firms. Put differently, why should banks respond to tight monetary policy by cutting back on their loans, rather than by trying to continue lending by raising more money in the capital markets, or by disposing of other assets, such as securities?[11] Part of this confusion is the result of the limited amount of theoretical work on this topic; the solid microeconomic arguments that justify the conditions needed to permit monetary policy to shift bank loan supply had not been made when we started our work. Furthermore, empirical evidence that speaks directly to this phenomenon is hard to come by.

One of us recently developed a fully articulated model that helps to address some of the theoretical concerns.[12] In the model, banks raise funds from individual investors, and then in turn lend these funds out to borrowers, who can be thought of as bank-dependent corporations. The typical bank's job is complicated by the fact that individual investors are not as well informed as bank management about the value of the bank's existing assets. Depending on the type of liability the bank issues to finance itself, this may create an adverse selection problem, because banks with lots of nonperforming assets need to be charged a relatively high interest rate to account for their riskiness. In this case, given their imperfect information, individuals may insist that all banks pay a large premium to attract funds and safer banks may prefer to make fewer loans rather than to pay the rate required to attract funds. Alternatively, if the bank is able to fund itself completely with insured deposits, then the adverse selection problem is immaterial. Therefore, adverse selection problems can affect bank lending behavior if the bank's ability to issue insured deposits somehow is constrained, and it has to turn to noninsured sources of finance.

One implication of the model is that if the Federal Reserve can control the aggregate level of real insured deposits available to banks, then it will be able to influence loan supply. Loosely speaking, when the Fed drains reserves from the system, it forces banks to substitute away from insured deposit financing and toward adverse-selection-prone forms of nondeposit finance. This in turn leads to an overall cutback in bank lending. In this sense, the model provides a specific set of microfoundations for the notion of a bank-centric view of monetary transmission.

Monetary Policy and Bank Balance Sheets

In addition to its macroeconomic predictions, the model emphasizes that banks typically will face the same sort of financing problems as other nonfinancial firms. Accordingly, it suggests a range of additional micro tests that we are beginning to undertake. For instance, it suggests looking at whether banks that should have trouble raising external finance—"small" banks—respond differently to a tightening of monetary policy than do ("large") banks that should be able to raise external funds easily. Our most recent paper[13] tests this hypothesis using data at an intermediate level of disaggregation. Because of the complications of working with bank level data, we opted as a first step to explore whether the behavior of a composite bank made up of all "large" banks differed from that of another composite bank made up of all "small" banks.

We found that small banks' lending was indeed more sensitive to Fed-induced shocks to deposits than lending by large banks. We also found that the small banks' holdings of securities were as sensitive to these shocks as the securities holdings of large banks. Overall, the fact that small banks had to reduce their asset holdings more across the board is consistent with the notion that they face greater difficulties in adjusting to monetary-policy-induced contractions in deposit financing. Therefore, the results fit with the adverse selection model of bank financing.

We are now in the process of organizing a true bank-level database that can be tapped to sharpen these tests. By studying microdata on banks' balance sheets, we can identify with confidence banks that should be most prone to cut lending in response to deposit shocks. For instance, banks with low levels of capital, banks that are chronic net borrowers in the federal funds market, and small banks that have no national name recognition all can be examined to see if their lending is especially sensitive to access to funds. The microdataset also can be used to study more general issues regarding bank behavior, such as how banks' lending moved in response to the regional economic shocks during the 1980s.

We remain enthusiastic about our continued investigation of various aspects of bank behavior, because the implications of theories that place banks at the center of the monetary policy transmission mechanism are quite different from those of standard theories that ignore the role of banks. For example, the presence of a lending channel implies that:

- standard indicators, such as the quantity of money, do not capture the effects of monetary policy adequately;
- changes in the regulation of the banking sector can have important consequences for the transmission of monetary policy; and,
- monetary policy may have distributional consequences that depend on how much financing a firm or sector receives from banks.

Ultimately, we hope that our work will allow us to learn enough about the role of banks in the transmission of monetary policy to gauge the importance of these sorts of considerations.

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[1]*B. S. Bernanke and A. S. Blinder, "Credit, Money, and Aggregate Demand,"* American Economic Review Papers and Proceedings *78 (1988), pp. 435–439, and "The Federal Funds Rate and the Channels of Monetary Transmission,"* American Economic Review *82 (1992), pp. 901–921.*

[2]*A finding that these forms of financing move in opposite directions following a monetary contraction should not be taken as an indication that firms cut off from banks are the ones who begin issuing commercial paper. Instead, a much more realistic interpretation is that firms cut off from bank lending receive increased trade credit, and that trade credit is supplied by firms with access to the commercial paper market. See C. W. Calomiris, C. P. Himmelberg, and P. Wachtel, "Commercial Paper and Corporate Finance: A Microeconomic Perspective," NBER Working Paper No. 4848, September 1994, and* Carnegie–Rochester Conference Series on Public Policy *42 (1995), for some evidence showing that this mechanism may explain why bank loans and commercial paper are substitutes at an aggregate level.*

[3]*We defined the mix variable to be the ratio of bank loans to the sum of bank loans plus commercial paper.*

[4]*C. D. Romer and D. H. Romer, "New Evidence on the Monetary Transmission Mechanism,"* Brookings Papers on Economic Activity *(1990), pp. 149–213.*

[5]*See B. M. Friedman and K. N. Kuttner, "Economic Activity and Short-Term Credit Markets: An Analysis of Prices and Quantities,"* Brookings Papers on Economic Activity *(1993), pp. 193–266, for a more comprehensive discussion of this mechanism. Another way to use information about substitutes for bank loans to resolve the identification problem is to study movements in* relative prices *rather than* relative quantities. *Specifically, changes in loan supply could be identified by checking whether the price of loans increases relative to the price of an alternative such as commercial paper. We also found that when the Fed tightens, the prime rate rises relative to the commercial paper rate. Movements in this spread help to forecast investment even after controlling for the cost of capital.*

[6]*S. D. Oliner and G. D. Rudebusch, "A Comment on Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance,"* American Economic Review, *forthcoming.*

[7]*A. K. Kashyap, J. C. Stein, and D. W. Wilcox, "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Reply,"* American Economic Review, *forthcoming.*

[8]*A. K. Kashyap, J. C. Stein, and D. W. Wilcox, "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance,"* American Economic Review *(March 1993), pp. 78–98.*

[9]*A. K. Kashyap, O. Lamont, and J. C. Stein, "Credit Conditions and the Cyclical Behavior of Inventories,"* Quarterly Journal of Economics *109 (1994), pp. 565–592.*

[10]*M. Gertler and S. Gilchrist, "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms,"* Quarterly Journal of Economics *109 (1994), pp. 309–340.*

[11]*See A. K. Kashyap and J. C. Stein, "Monetary Policy and Bank Lending," in* Monetary Policy, *N. G. Mankiw, ed. Chicago: University of Chicago Press, 1994, pp. 221–256, for further discussion of these issues.*

[12]*See J. C. Stein, "An Adverse-Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy," NBER Working Paper No. 5217, August 1995.*

[13]*See A. K. Kashyap and J. C. Stein, "The Impact of Monetary Policy on Bank Balance Sheets," NBER Working Paper No. 4821, August 1994, and* Carnegie–Rochester Conference Series on Public Policy *42 (1995), pp. 151–195.*

Behavioral Economics

Richard H. Thaler

Neoclassical economics is built on the assumption that the agents in the economy are self-interested and rational. These assumptions are what distinguishes economics from other social science disciplines, such as psychology and sociology; as such, they are simultaneously the source of the power in economic theorizing and the fundamental weakness in the method. The assumption of rationality is what permits economists to use their most powerful theoretical tool: optimization. But, if agents are not rational, what then? My research over the last 15 years has attempted to answer this question.

Of course, critiques of the assumptions of economics are as old as the use of those assumptions. For many economists, Milton Friedman provided the definitive response to such criticism in his famous essay on positive economics.[1] There he argued that theories should not be evaluated on the basis of the validity of their assumptions, but rather on the accuracy of their predictions. An expert billiards player, he noted, may not know the laws of physics, but acts as if he knows such laws. I completely share Friedman's view that theories should be judged on the basis of predictive power; in my research, I have used this criterion to evaluate alternative models. However, as I have tried to show in my series of "Anomalies" articles in the *Journal of Economic Perspectives*,[2] the theory fails on precisely these grounds. In such circumstances it makes sense to take a careful look at the assumptions. Perhaps most economic agents make decisions the way most of us play pool: badly.

At some level, of course, the rationality assumption has to be wrong. As noted by Herbert Simon, people are only boundedly rational. How does a boundedly rational agent differ from a rational agent? If the differences are random then the rational model still produces unbiased predictions of behavior. However, as the work of Daniel Kahneman and Amos Tversky[3] has shown, actual behavior differs from rational choice in systematic ways. Their research program of discovering the heuristics people use to make judgments, and the biases inherent in those heuristics, provided my motivation in exploring behavioral economics.

If economic agents make judgments and choices that differ systematically from those prescribed by the rational model, then we can improve the models by incorporating these factors into our theories. My first paper in this domain[4] described several ways in which most people fail to act like "Homo Economicus": for example, they fail to ignore sunk costs, they undervalue opportunity costs relative to out-of-pocket costs, and they have trouble exerting self-control. Sometimes, agents know about their own biases. Thus, people who know they have self-control problems will, like Odysseus, tie themselves to the mast to prevent future transgressions. They join Christmas clubs (or used to before credit cards eliminated the need to be liquid at Christmas time), go to fat farms (resorts that, for a high fee, agree to starve their guests), and pay in advance to join a health club, knowing that the sunk cost will help motivate them to go more often.

One objection to models with less than fully rational agents is the claim that in markets, such agents either will be eliminated or rendered irrelevant. Russell and I investigated this claim in a paper[5] that considers a world with two kinds of agents: the fully rational agents that populate standard economic models, and what we call "quasi-rational agents" who make predictable, systematic errors. We then looked for the conditions necessary for such a world to produce the same equilibriums that would obtain if all the agents were fully rational. We find that these conditions rarely are met, even in markets that function very well, such as financial markets. Often, if I insist on choosing a less than optimal choice for me (say a dominated alternative), there will not be any way for you to make money from my mistake, either by exploiting it or by educating me. Quasi-rationality is neither fatal nor immediately self-defeating.

How can we begin to model "Homo Behavioral Economicus"? A small list of factors can go a long way toward better descriptive models. The following concepts have proven most useful so far:

1. **Overreaction.** If people make judgments using what Kahneman and Tversky call the representativeness heuristic, they judge the likelihood of an event by how similar the event is to the typical or stereotype of that event. This heuristic, like all those that are used widely, is often accurate, but it leads to systematic biases. For example, forecasts stemming from the representativeness heuristic violate Bayes's rule because recent evidence is given too much weight relative to prior odds. Forecasts tend to be too extreme, relative to the norm.

2. **Loss aversion.** It is well accepted that people tend to adapt to current circumstances and to react to changes relative to the recent norm rather than to levels. Furthermore, the sensitivity to losses is greater than the sensitivity to gains. Roughly speaking, the loss of $1 is about twice as painful as the gain of $1 is pleasurable.

3. **Mental accounting.** Standard accounting principles, and all economic theory, assumes that money is fungible. Behavior should not depend on the label associated with any pot of money. However, both individuals and organizations violate this principle. This implies that the rules people use to aggregate transactions and wealth holdings are important in understanding their behavior. I call these rules "mental accounting."[6]

4. **Fairness.** All other things equal, people prefer to be treated fairly and like to treat other people fairly. This is not to say that people do not care first and foremost about their own household's welfare, but rather that concerns about fairness also matter and compete with purely selfish motives for scarce resources. In another paper,[7] Kahneman, Knetsch, and I explored lay perceptions of what is fair. We found that the determinants of such perceptions were explained in turn by other behavioral factors such as loss aversion. For example, people thought it was much less fair for a dealer to impose a $200 surcharge above list price for a scarce car model than to eliminate a $200 discount. Perceptions of fairness also displayed money illusion. For example, cutting wages 5 percent in an economy with no inflation was judged to be much less fair than offering a 7 percent raise in an economy with 12 percent inflation.

I have applied these and other behavioral factors in a variety of settings, always with the goal of trying to improve the explanatory power of economic analysis. One domain that has taken a lot of my attention over the last ten years is financial markets. This field is an attractive place to do behavioral economics for two reasons. First, the data are extraordinarily good. Second, many economists have the "prior" (or did a decade ago) that behavioral factors are least likely to surface in these, the most efficient of all markets.

My first papers in this area were written with Werner De Bondt. In the first one,[8] we reported the successful prediction of a new anomaly in asset markets, namely long-term mean reversion for individual stocks. David Dreman[9] offered a behavioral explanation for the "price/earnings" anomaly: namely, that stocks with low p/e ratios systematically outperform those with high p/e's. His explanation was: because investors use the representativeness heuristic, they would make excessively optimistic earnings forecasts for firms growing rapidly and excessively pessimistic forecasts for those in trouble, that is, high and low p/e firms, respectively. When these forecasts proved wrong in the predictable ways, prices would adjust, causing high p/e firms to have low returns and low p/e firms to have high returns.

We thought that if this argument was correct we should be able to observe the same phenomenon for firms chosen by past performance rather than p/e. We therefore ranked firms by 3–5-year past returns and selected the most extreme performers. We then tracked these extreme "winners" and "losers" for the next 3–5 years. We found substantial mean reversion, as predicted by the behavioral analysis.[10]

De Bondt and I also looked for evidence of the representativeness heuristic in professional analysts' forecasts of earnings.[11] Recall that when this heuristic is used, forecasts are too extreme. We regressed the actual change in earnings for a year on the consensus forecasted change in earnings (made in April for December 31 fiscal year firms). If the forecasts were rational, the intercept in this regression would be zero and the slope would be one. Instead we found that the forecasts were biased in two ways. First, the intercept was significantly negative, implying that the forecasts were optimistic (consistent with past research). Second, the slope coefficient was only 0.65. This means that the forecasted changes in earnings were too extreme. One could improve the analysts' forecasts simply by subtracting a constant (to correct for the optimism bias) and reducing the forecasted change by a third (to make the forecasted changes less extreme).

Saving behavior is a domain in which behavioral factors have proven to be extremely important. In the standard life-cycle model, households compute their lifetime wealth constraint, optimize their spending stream, and save accordingly. Components of wealth are not distinguished since all money is assumed to be fungible. In the behavioral life-cycle model,[12] the standard framework is modified to incorporate two important behavioral factors: self-control and mental accounting.

First, we recognize that most households other than the very rich are constrained by self-control considerations. Even if they could and did solve for their optimal spending path, they would find it difficult to stay on this path. Mental accounting comes into play because the location of wealth influences spending choices, since some mental accounts are more "tempting" than others. For example, cash on hand is more tempting than money in a savings account, which in turn is more tempting than money in an IRA, pension plan, or home equity.

The difference between the standard model and the behavioral model is particularly striking in analyzing programs designed to increase saving, such as IRAs and 401(k)s. According to the standard theoretical analysis, these plans have no effect on saving because most contributors already had some assets saved up that simply could be shifted to the retirement accounts. In this scenario, there is no incentive to save at the margin, so the programs should have no effect.

In a mental accounting framework, however, saving is expected to increase because the programs help put money into less tempting accounts. Consider a child who takes money from a leaky piggybank and puts it into a bank. According to the standard theory, assets simply have been shifted, but a behavioral analysis predicts that spending will fall. The same is true for IRAs and other pension saving; my reading of the evidence is that this view is supported.[13]

Loss aversion is perhaps the most pervasive of all the behavioral factors uncovered to date. In a sample experiment Kahneman, Knetsch, and I ran,[14] subjects traded tokens, whose value to each subject was private information. Half of the subjects were then given a token, and markets were "conducted" in which reservation prices were elicited from both token owners and buyers. Both price and volume in these markets were exactly as simple supply and demand analyses would predict, showing that transactions costs were negligible in this market.

Then, another set of markets was conducted, this time for coffee mugs imprinted with the local university insignia. Again, half the subjects had a mug and half did not. The Coase theorem predicts that in this situation half the mugs on average should trade: mugs should end up in the hands of the subjects who value them most, only half of whom would have received one in the random assignment of mugs at the beginning of the experiment. Counter to this prediction, only about 15 percent of the mugs traded; the median reservation prices of mug owners were roughly twice the reservation prices of the mug buyers. In other words, we found "loss aversion" for mugs. Obviously, this result calls into question the Coasean claim that in the absence of transactions costs (known to be negligible in this case) the initial assignment of property rights will not affect the ultimate allocation of resources.

In a paper with Benartzi,[15] the concepts of loss aversion and mental accounting are combined to offer an explanation for the well-known equity premium puzzle.[16] The puzzle refers to the fact that over very long periods of time, equities have earned much higher rates of return than bonds or other fixed-income assets (roughly 6–7 percent real annual return versus 1 percent). This difference is too large to be explained easily within the standard framework. Our explanation is based on the following intuition: suppose investors are loss averse, implying that losses are weighted more heavily than gains.[17] Then, their willingness to hold risky assets will depend on the frequency with which they evaluate their holdings. If loss-averse investors compute the value of their portfolios daily, they will hate equities, since on a daily basis stocks decline nearly as often as they rise. In contrast, investors with a horizon of say 20 years would find stocks very attractive since the risk of loss is tiny. Thus motivated, we estimate the frequency with which loss-averse investors would have to be evaluating their portfolios in order to make the investors indifferent between stocks and bonds. We find this to be approximately once a year, a highly plausible result. Therefore we dub our explanation for the equity premium puzzle "myopic loss aversion," since most investors (for example, pension plans, endowments, and those saving for retirement) should have horizons of much more than one year.

As I hope these examples have made clear, I view behavioral economics as an entirely constructive enterprise. The goal is simply to make economic models better at explaining economic activity. In this sense, behavioral economics is simply economics with a higher R^2.

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[2] *These are reprinted in R. H. Thaler,* The Winner's Curse, *Princeton: Princeton University Press, 1992.*

[3] *D. Kahneman, P. Slovic, and A. Tversky,* Judgment Under Uncertainty: Heuristics and Biases, *New York: Cambridge University Press, 1982; and D. Kahneman and A. Tversky, "Prospect Theory: An Analysis of Decision Under Risk,"* Econometrica *47, 2, (1979), pp. 363–391.*

[4] *R. H. Thaler, "Toward a Positive Theory of Consumer Choice,"* Journal of Economic Behavior and Organization *1 (1980) pp. 39–60. This paper, and most of the others cited here, are reprinted in R. H. Thaler,* Quasi-Rational Economics, *New York: Russell Sage Foundation, 1991.*

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[7] *D. Kahneman, L. Knetsch, and R. H. Thaler, "Fairness as a Constraint on Profit Seeking: Entitlements in the Market,"* Americen Economic Review *76 (September 1986), pp. 728–741.*

[8] *W. F. M. De Bondt and R. H. Thaler, "Does the Stock Market Overreact?"* Journal of Finance *40 (July 1985), pp. 793–805.*

[9] *D. Dreman,* The New Contrarian Investment Strategy, *New York: Random House, 1982.*

[10] *This pattern has now been well documented in numerous additional studies, such as W. F. M. De Bondt and R. H. Thaler, "Further Evidence on Investor Overreaction and Stock Market Seasonality,"* Journal of Finance *42 (July 1987), pp. 557–581; E. Fama and K. French, "The Cross-Section of Stock Returns,"* Journal of Finance *46 (1992), pp. 427–466; and J. Lakonishok, A. Shleifer, and R. W. Vishny, "Contrarian Investment, Extrapolation, and Risk,"* Journal of Finance *49 (December 1994), pp. 1541–1578.*

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[12] *R. H. Thaler and H. M. Shefrin, "An Economic Theory of Self- Control,"* Journal of Political Economy *89 (1981), pp. 392–401; and H. M. Shefrin and R. H. Thaler, "The Behavioral Life-Cycle Hypothesis,"* Economic Inquiry *26 (October 1988), pp. 609–643.*

[13] *See, for example, J. Skinner "Individual Retirement Accounts: A Review of the Evidence,"* Tax Notes *54, 2 (January 1992), pp. 201–212.*

[14] *D. Kahneman, L. Knetsch, and R. H. Thaler, "Experimental Tests of the Endowment Effect and the Coase Theorem,"* Journal of Political Economy *98 (December 1990), pp. 1325–1348.*

[15] *S. Benartzi and R. H. Thaler, "Myopic Loss Aversion and the Equity Premium Puzzle,"* Quarterly Journal of Economics *110 (February 1995), pp. 73–92.*

[16] *R. Mehra and E. C. Prescott, "The Equity Premium Puzzle,"* Journal of Monetary Economics *15 (1985), pp. 145–161.*

[17] *Specifically, we assume investors act in accordance with cumulative prospect theory. See A. Tversky and D. Kahneman, "Advances in Prospect Theory: Cumulative Representation of Uncertainty,"* Journal of Risk and Uncertainty *5 (1992), pp. 297–323.*

Do Retirement Saving Programs Increase Saving?

David A. Wise

A large fraction of American families reach retirement age with virtually no personal financial assets. The median level of all personal financial assets of families with heads aged 55 to 64 was only $8,300 in 1991; excluding Individual Retirement Accounts (IRAs) and 401(k) balances, the median was only $3,000. Almost 20 percent of families had no financial assets at all. Thus, other than Social Security benefits, employer-provided pension benefits, and housing wealth that is illiquid, the typical family has very limited resources to use in meeting unforeseen expenses. In addition to individual hardship, one consequence of the low U.S. saving rate is the prospect of limited future economic growth at the aggregate level.

Two saving programs introduced in the early 1980s were intended to encourage individual saving. IRAs rapidly became a very popular form of saving in the United States after they were made available to all employees in 1982. Any employee could contribute $2,000 per year to an IRA account, and a nonworking spouse could contribute $250. The contribution was tax deductible. Annual contributions grew from about $5 billion in 1981 to about $38 billion in 1986, approximately 30 percent of total personal saving. Contributions declined precipitously after the Tax Reform Act of 1986, even though the legislation limited the tax deductibility of contributions only for families who had annual incomes over $40,000 and who were covered by an employer-provided pension plan. By 1990, less than $10 billion was contributed to IRAs. Whereas over 15 percent of tax filers made contributions in 1986, only 4 percent contributed in 1990.

The other program, the 401(k) plan, grew continuously and almost unnoticed, with contributions increasing from virtually zero at the beginning of the decade to over $51 billion in 1991. In 1991, almost 25 percent of families contributed to a 401(k). Deposits in 401(k) accounts are also tax deductible and the return on the contributions accrues tax free; taxes are paid upon withdrawal. But these plans are available only to employees of firms that offer such plans. Prior to 1987 the employee contribution limit was $30,000, but the Tax Reform Act of 1986 reduced the limit to $7,000, and indexed this limit for inflation in subsequent years. The contribution limit is $9,235 for the 1994 tax year.

By 1991, contributions to all personal retirement saving plans exceeded contributions to traditional employer-provided pension plans. It seems evident that if it were not for the 1986 tax legislation, personal retirement saving would have been much larger. Whether these programs increase net saving can be of critical importance to future generations of older Americans and to the health of the economy in general. The issue remains an important question of economic debate. In a series of papers based on very different methods of analysis, Steven F. Venti and I and James M. Poterba, Venti, and I have concluded that contributions to these accounts represent new saving in large part.

In determining the effect on saving of IRAs and 401(k)s, the key problem is saver heterogeneity: some people save and others don't, and the savers tend to save more in all forms. For example, families with IRAs have larger balances in all financial assets than families without IRAs. But this does not necessarily mean that IRAs explain the difference. Thus a continuing goal of the analysis has been to consider different methods of controlling for heterogeneity, or individual-specific saving effects. The methods that could be used when each analysis was conducted were largely dependent on the data available at that time. As new data became available, we used alternative and possibly more robust methods.

Early Parametric Analysis of Substitution at the Outset of the IRA Program

When we began this work in the mid-1980s, data were available for a limited time period; assets typically could be measured at only two points in time, one year apart. To use these data, Venti and I developed an econometric model for estimating the relationship between IRA saving and other saving. Within a framework that allowed for any degree of substitution between IRA and non-IRA saving, we asked: after controlling for age, income, other personal characteristics, and accumulated housing and financial assets, do persons who save more in the form of IRAs in a particular year save less in other financial asset forms? Given age and income, this approach used accumulated financial assets to control for "individual-specific" saving effects. The analysis accounts for the explicit limit on IRA contributions and places substantial emphasis on the change in non-IRA saving after the IRA limit is reached. The first results using this approach were based on early data from the 1983 Survey of Consumer Finances.[1] Subsequent analysis was based on the 1980–5 Consumer Expenditure Surveys and the 1984 panel of the Survey of Income and Program Participation (SIPP).[2]

The results suggested that the majority of IRA saving, even at the outset of the program, represented net new saving, and was not accompanied by large-scale reduction in other financial asset saving. According to these findings, increases in the IRA limits would lead to substantial increases in IRA saving and very little reduction in other saving. If the IRA limit were raised, one-half to two-thirds of the increase in IRA saving would be funded by a decrease in current consumption, and about one-third by reduced taxes; only a very small proportion—at most 20 percent—would come from other saving.

Following Individuals Over Time at the Outset of the IRA Program

As new data were released it became possible to use different methods to control for heterogeneity. We used two approaches based on traditional panel data.

Changes in Other Saving When Individual IRA Participation Status Changes

If non-IRA saving is reduced when IRA saving is increased, then when a household that was not contributing begins to contribute, that household should reduce non-IRA saving. Likewise, when a household that was contributing stops contributing, non-IRA saving should increase. But when the same families are tracked over time, there is little change in other financial asset saving when families begin to contribute to an IRA (or when they stop contributing). The SIPP panel data allow calculation of the change in non-IRA saving when IRA contributor status changes. This simple calculation controls directly for changes in saving behavior across families since it is based on changes over time for the same families. We considered the change in other (non-IRA) saving between 1984 and 1985 by IRA contributor status.[3]

These data reveal little substitution. The key information in this approach is the change in other financial assets when families began to contribute to an IRA. In particular, we consider the change for families that did not contribute in 1984 but did contribute in 1985. If the new IRA saving substituted for other financial asset saving, one would expect other saving to decline between 1984 and 1985. But the non-IRA financial asset saving of these new contributors declined by only $193 between 1984 and 1985. This decline in other saving is only a small fraction of the increase in saving from the typical family IRA contribution, about $2,300. Thus these data also suggest that even near the outset of the IRA program there was only a small reduction in non-IRA saving when IRA contributions began.

Following Households in the Survey of Consumer Finances

Using 1983 and 1986 Survey of Consumer Finances data, it is possible to compare the asset balances of the same households over time. Venti and I considered how the assets of IRA contributors changed over this time period.[4] Households that made IRA contributions over this period began the period with a *median* of $9,400 in other financial assets in 1983. Between 1983 and 1986, the median IRA assets of these families increased from $1,000 to $7,000. At the same time, the median of other financial assets increased from $9,400 to $13,500. These families ended the period with median total financial assets, including IRAs, of $24,000—an increase of 100 percent over assets in 1983. We determined that the increase could not be accounted for by change in age, income, or rate of return. Thus we concluded that it was unlikely that the IRA contributions simply substituted for saving that would have occurred anyway.

Following "Like" Saver Groups Over Time

Another way to control for heterogeneity is to group families according to their saving behavior—their "taste" for saving—and to follow the progress of the saving of these "like" families over time. Poterba, Venti, and I[5] followed this approach, grouping families according to whether they did or did not contribute to an IRA. We also grouped families according to whether they were eligible for a 401(k) plan and whether they contributed to that plan. Altogether, we considered eight different groups of "saver types." We focused on the change in the other saving of families in these groups who had been exposed to 401(k) and IRA plans for different time periods.

For example, data from the SIPP were available for 1984, 1987, and 1991. Random samples of family types are similar in each of these years, but the 1984 sample has had only about two years (1982 to 1984) to accumulate 401(k) and IRA balances, while the 1987 sample has had about five years, and the 1991 sample about nine years. The central question is whether longer exposure to these plans results in higher levels of saving by families who participate in the programs. The key test is whether non-IRA–401(k) assets declined as IRA and 401(k) assets increased. The answer is typically no. In each of the six different IRA or 401(k) participant saver groups, there was an increase in total financial assets between 1984 and 1991, but little change in non-IRA or non-401(k) financial assets.

It is sometimes suggested that these programs may affect households with limited assets but have little effect on wealthier households. We have addressed this issue by comparing the distribution of assets in 1984 and 1991. Again, we rely on the fact that by 1991 households had had much more time to contribute to the saving programs.[6] The higher levels of total financial assets held by IRA and 401(k) participant families in 1991 was not limited to families with large or small asset balances. Rather, the effect was evident across the entire distribution of households, from those with the least to those with the greatest assets. On the other hand, across the entire distribution, there was almost no change—between 1984 and 1991—in the non-IRA–401(k) assets of contributors. At all points in the distribution there was a fall over time in the assets of noncontributors.

The 401(k) Eligibility "Experiment"

Another approach relies on the "experiment" that is provided by the largely exogenous determination of 401(k) eligibility. It considers whether eligibility is associated with higher levels of total saving, holding income and other demographic characteristics constant. In this case the key question is: did families who were eligible for a 401(k) in a given year have larger total financial asset balances than families who were not eligible, or, equivalently, did non-401(k) financial assets decline enough to offset the 401(k) contributions of eligible families?[7]

The inferences about the net saving effect of 401(k) contributions depend on the similarity of the saving behavior of families who are and are not eligible for a 401(k), controlling for income. It is important, for example, that the eligible group not be composed disproportionately of savers. The data show little evidence of this type of difference in saving behavior. The most compelling evidence is for 1984. In that year the two groups —eligibles and noneligibles—had about the same level of other financial assets. Thus, near the outset of the 401(k) program, families that were newly eligible for a 401(k) exhibited about the same previous saving behavior as families that did not become eligible.

Data for families with incomes between $40,000 and $50,000 illustrate the findings: In 1984, newly eligible and ineligible 401(k) families had almost identical non-401(k)-IRA assets of $5,027 and $5,082, respectively. By 1991, however, the median of total financial assets of eligibles families was $14,470, compared to $6,206 for ineligible families. But in 1991, the non-IRA–401(k) assets of the two groups were still about the same, $4,724 for eligible and $4,250 for the ineligible group. If families reduced saving in other forms when they became eligible for a 401(k) plan, the typical eligible family in 1991 would have accumulated less wealth in other financial assets than the typical noneligible family. This was not the case. Looking over all income intervals, the total financial assets of the eligible families by 1991 were typically two to eight times as large as the total financial assets of the noneligible families. Thus this approach shows no substitution of 401(k) contributions for other financial asset saving.

Indeed, for all income groups, eligible households have greater total financial assets than ineligible households at virtually all points across the entire distribution of financial assets. But there is virtually no difference across the entire distribution of the other financial assets of eligible and ineligible households.

Cohorts and the Effects of Retirement Saving Programs

In the United States

No single method provides a perfect control for all possible forms of heterogeneity. I believe that the method that comes the closest is cohort analysis. Essentially, this method compares the assets of persons who are the same except for age. Hence some groups—cohorts—had longer to contribute to special saving programs. For example, families that reached age 65 in 1984 had had only two years to contribute to an IRA or to a 401(k) plan. But families who attained age 65 in 1991 had had nine years to contribute.[8]

Venti and I find that younger families had consistently larger total financial assets than older families. The larger assets of the younger cohort are accounted for almost entirely by more assets in IRA and 401(k) plans. On average, there is no difference between the other financial assets of the older and younger cohorts. These results can be illustrated by comparing the assets of families who reached ages 60 to 64 in 1984 with the assets of families that attained that age in 1991.

To control for heterogeneity, the data for all families combined—both contributors and noncontributors—are the most compelling. The mean of total financial assets of all families that attained age 60 to 64 in 1984 was $32,807; the mean of those who attained this age in 1991 was $39,105 (in 1991 dollars and controlling for income, age, education, and marital status). The increase was accounted for almost entirely by personal retirement saving—$4,027 for the cohort that attained ages 60 to 64 in 1984 compared to $10,995 for the cohort that attained this age in 1991. There was essentially no cohort difference in other financial assets ($28,780 for the older cohort and $28,110 for the younger cohort). Because fewer than half of families participated in these programs, the median for all families is zero and therefore is not informative. The data for families who participated in personal retirement saving plans provide a better measure of the potential of the plans to augment the financial assets of retirees: the median level of total personal financial assets of contributor families that attained age 60 to 64 in 1984 was $29,847. Families that attained this age in 1991 had median total financial assets of $45,019. The median level of personal retirement plan assets of the families that reached this age in 1984 was $7,575. Those that reached this age in 1991 had $21,613. In contrast, the other financial assets of these families were about the same in 1984 and 1991 ($19,358 and $17,950, respectively). Thus there is little evidence of substitution of personal retirement saving for other financial assets. In contrast, the financial assets of families that attained age 60 to 64 in 1991 but did not participate in the personal retirement plans, were somewhat lower than similar families who reached this age in 1984.

This is the typical pattern for all ages that we considered, between 45 and 70. Indeed, the analysis suggests that if current patterns persist, families who reach retirement age 25 or 30 years from now will have much more in financial assets (at least $30,000) than families currently attaining retirement age; the difference will be due solely to assets in personal retirement accounts.

In Canada

Registered Retirement Saving Plans (RRSPs) were first introduced in Canada in 1957. Like contributions to an IRA in the United States, contributions to an RRSP are deductible from income for tax purposes. Interest accrues tax free until withdrawal, when taxes are paid. The contribution limits were increased substantially in the early 1970s, and RRSPs were promoted widely. Since then, they have become a very prominent form of saving. Annual contributions grew from $225 million in 1970 to almost $3.7 billion in 1980 to $16 billion by 1992, when they accounted for about one-third of aggregate personal saving. In 1992 about 33 percent of families contributed an average of $4,180 to RRSPs. Now RRSP contributions exceed the total of employee and employer contributions to employer-provided pension plans.

Based largely on "cohort" analysis like the procedure illustrated above, Venti and I conclude that the data taken as a whole suggest that RRSPs have contributed substantially to personal saving in Canada.[9] In virtually no case do the data suggest substitution of RRSPs for other forms of retirement saving. In the two decades prior to the growth in popularity of RRSPs, the personal saving rate in Canada was typically below the U.S. personal saving rate. Since that time, the personal saving rate in Canada has become much higher than in the United States. Although it is difficult to make judgments about the RRSP effect on saving based only on the trends in U.S. and Canadian aggregate saving rates, a large fraction of the current difference can be accounted for by RRSP saving.

To Consider

This series of papers suggests that the IRA and the 401(k) programs have had very important effects on saving and are likely to add substantially to the assets of future retirees. In addition, I believe that the research has another fundamental underlying theme: standard assumptions about the determinants of saving behavior leave important aspects of actual saving unexplained. For example, the Tax Reform Act of 1986 led to reductions in IRA contributions well beyond the effects that might have been predicted by models that rely on the aftertax rate of return. Even the contribution rate of persons whose aftertax rate of return was unaffected by the legislation was reduced by 40 to 50 percent. Higher-income families that lost the up-front deduction virtually stopped contributing, even though the return still accrued tax free. These results suggest that the promotion of saving plans may have an important effect on their use. The results also suggest that the up-front tax deduction may have been a critical determinant of the decision to make an IRA contribution.

Although the IRA participation rate was never more than 16 or 17 percent, the participation rate among persons eligible for a 401(k) is above 60 percent, and is at least 50 percent even for low-wage earners. In addition to greater financial incentives provided by employer matching rates, a likely explanation is that contributions are typically by payroll deduction, and thus sheltered from current expenditure urges: the "out of sight, out of mind" feature of the payroll deduction arrangement may provide needed self control. More generally, the findings bring into question the extent to which different forms of saving are treated as perfect substitutes by real people. Thus in my view the results provide motivation to look more broadly for explanations of saving behavior.

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[1] *S. F. Venti and D. A. Wise, "Tax-Deferred Accounts, Constrained Choice, and Estimation of Individual Saving,"* Review of Economic Studies *53 (1986); "IRAs and Saving," in* The Effects of Taxation on Capital Accumulation, *M. Feldstein, ed. Chicago: University of Chicago Press, 1987; and D. A. Wise, "Individual Retirement Accounts and Saving," in* Taxes and Capital Formation, *M. Feldstein, ed. Chicago: University of Chicago Press, 1986.*

[2] *S. F. Venti and D. A. Wise, "Have IRAs Increased U.S. Saving? Evidence from Consumer Expenditure Surveys,"* Quarterly Journal of Economics *(August 1990), pp. 661–698; and "The Saving Effect of Tax-Deferred Retirement Accounts: Evidence from SIPP," in* National Saving and Economic Performance, *B. D. Bernheim and J. B. Shoven, eds. Chicago: University of Chicago Press, 1991.*

[3] *S. F. Venti and D. A. Wise, "Individual Response to Retirement Savings Programs: Results from U.S. Panel Data,"* Richerche Economiche, *special issue, forthcoming.*

[4] *S. F. Venti and D. A. Wise, "Government Policy and Personal Retirement Saving," NBER Reprint No. 1752, October 1992, and in* Tax Policy and the Economy, Volume 6, *J. M. Poterba, ed. Cambridge: MIT Press, 1992, pp. 1–41.*

[5] *J. M. Poterba, S. F. Venti, and D. A. Wise, "401(k) Plans and Tax-Deferred Saving," in* Studies in the Economics of Aging, *D. A. Wise, ed. Chicago: University of Chicago Press, 1994; and "Do 401(k) Contributions Crowd Out Other Personal Saving?"* Journal of Public Economics, *forthcoming.*

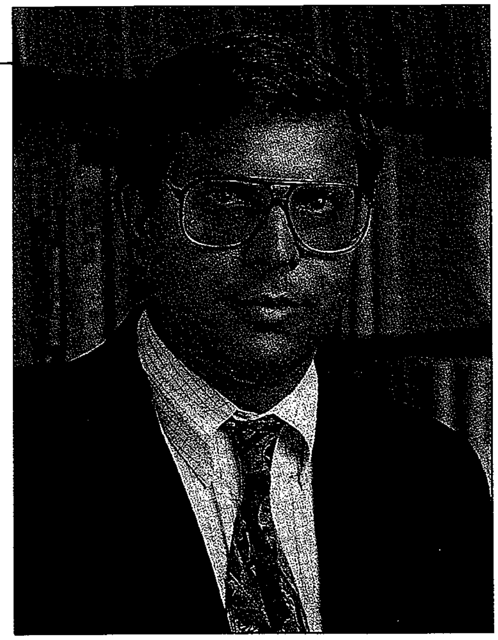
[6] *J. M. Poterba, S. F. Venti, and D. A. Wise, "Targeted Retirement Saving and the Net Worth of Elderly Americans,"* American Economic Review *84, 2 (May 1994).*

[7] *Poterba, Venti, and I also used this approach in "401(k) Plans and Tax-Deferred Saving" and "Do 401(k) Contributions Crowd Out Other Personal Saving?" op. cit.*

[8] *This is the approach that Venti and I followed in our analysis of "The Wealth of Cohorts: Retirement Saving and the Changing Assets of Older Americans," NBER Working Paper No. 4600, December 1993.*

[9] *S. F. Venti and D. A. Wise, "RRSPs and Saving in Canada," mimeo, 1995.*

NBER Profile: *Anil K Kashyap*



Anil K Kashyap is an NBER faculty research fellow and an associate professor of business economics at the University of Chicago's Graduate School of Business. He is a member of the NBER Programs in Corporate Finance and Monetary Economics and serves as the head of an NBER working group that studies the Japanese economy.

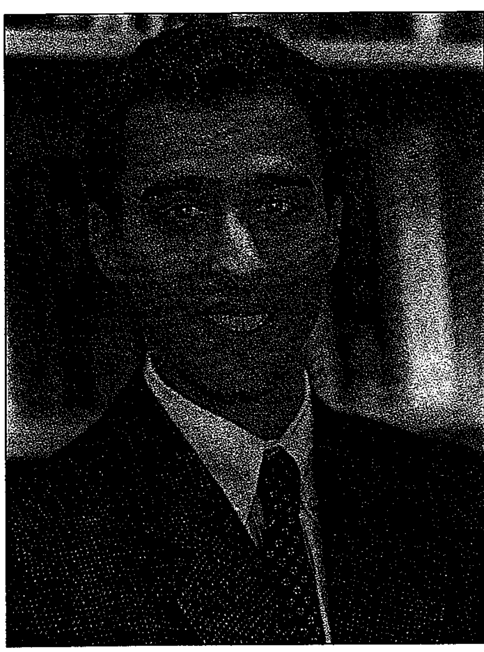
Kashyap earned his Ph.D. in economics in 1989 from MIT, and his bachelor's degree in economics and statistics from the University of California, Davis, in 1982. He currently teaches courses on "Money and Banking" and "An Introduction to the Japanese Economy."

Kashyap's principal research interests include the changing nature of the Japanese financial system, the impact of monetary policy beyond standard interest rate channels, and the sources of business cycles. His work has been published in a number of academic journals and books. With Takeo Hoshi, he currently is working on a book titled *Keiretsu Financing*, which will be published by the MIT Press next year.

Kashyap is also a member of the University of Chicago's Center for East Asian Studies, an associate fellow in the Federal Reserve Bank of Chicago's Research Department, and a member of the Advisory Council to the Japanese Ministry of International Trade and Industry's study of market access. He previously served as a staff economist for the Board of Governors of the Federal Reserve System.

Kashyap and his wife Katie Merrell have one daughter, Laurie, who is $2^1/_2$. His hobbies are "rotisserie baseball," bridge, and golf. He is also a season ticket holder of the Chicago Cubs.

NBER Profile: *Jeremy C. Stein*



Jeremy C. Stein has been an NBER research associate in the corporate finance program since 1992. He is also the J. C. Penney Professor of Management at MIT's Sloan School of Management.

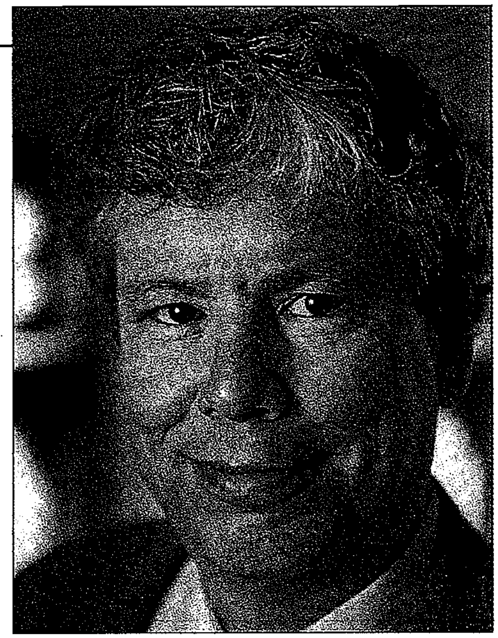
Stein received his A.B. in economics from Princeton University in 1983 and his Ph.D. in economics from MIT in 1986. From 1986–7 he was an intern at Goldman Sachs & Co. and a research fellow at the Harvard Business School (HBS). He was an assistant professor of finance at HBS from 1987–9, when he went to Washington to spend a year as senior staff economist at the Council of Economic Advisers.

Returning to Cambridge, Stein became an associate professor at MIT in 1990, a professor of finance there in 1993, and the J. C. Penney Professor in 1994.

In addition to his teaching and research, Stein serves as associate editor of the *Quarterly Journal of Economics* and the *Journal of Finance*. He is also on the editorial board of the *American Economic Review*.

Stein is married to Anne Maasland. They live in Lexington (MA) with their three children: Carolyn, $4^1/_2$; Alison, 2; and Jason, 5 months.

NBER Profile: *Richard H. Thaler*



Richard H. Thaler is a professor of behavioral science and economics, and director of the Center for Decision Research, at the University of Chicago's Graduate School of Business. He is a member of the NBER's Program on Asset Pricing, and also codirects (with Robert J. Shiller) the Bureau's Project on Behavioral Economics. He has been an NBER research associate since 1990.

Thaler received his Ph.D. in 1974 from the University of Rochester, where he also taught for a few years. His research in behavioral economics really began during a year he spent at the NBER's Palo Alto office in 1977–8. After that, he joined Cornell's Johnson Graduate School of Management, where he remained until 1995. He also has been a visitor at the University of British Columbia, MIT, and the Russell Sage Foundation.

Along with other books and journal articles, Thaler wrote a quarterly column for several years in the *Journal of Economic Perspectives* on anomalies. The first set of these columns was published in book form by Princeton University Press under the title *The Winner's Curse: Paradoxes and Anomalies of Economic Life*. He recently resumed writing this column.

Thaler and his "significantly better," France Leclerc, a marketing professor at the University of Chicago, live in the Lincoln Park section of that city. In addition to trying to keep themselves warm in the winter and their collection of fine wine cool in the summer, they enjoy travel—especially to places with good restaurants, scuba diving, or skiing.

Conferences

Franco–American Seminar on Youth Unemployment

The eighth annual Franco–American Seminar, held in Cambridge on July 28, was devoted to the theme of "Youth Unemployment." This meeting and the papers prepared for it are part of the NBER Project on "Youth Unemployment in the United States and Europe," headed by David G. Blanchflower, NBER and Dartmouth College; Wolfgang Franz, University of Konstanz; and Richard B. Freeman, NBER and Harvard University. The program for the seminar, organized by Blanchflower and Denis Fougère, CREST-INSEE, was:

David G. Blanchflower, "Youth Labor Markets in 23 Countries: A Comparison Using Micro Data"

Liliane Bonnal, CRESEP, Université d'Orléans;
Denis Fougère; and
Stefan Lollivier, INSEE, "Youth Unemployment in France: Recurrence and Heterogeneity"
Discussant:
Charles C. Brown, NBER and University of Michigan

John M. Abowd, NBER and Cornell University;
Francis Kramarz, INSEE-CREST;
Thomas Lemieux, NBER and University of Montréal; and
David N. Margolis, University of Montréal, "Minimum Wages and Youth Unemployment in France and the United States"
Discussant:
Lawrence F. Katz, NBER and Harvard University

Didier Gelot and
Gerard Osbert, DARES, "Policies for Youth Employment in France over the Past 20 Years"
Discussant:
John M. Abowd

Using a unique dataset covering individuals in 23 countries over an eight-year period, **Blanchflower** finds that a number of traits distinguish the young from the older: 1) They have a relatively high probability of being unemployed and a relatively low probability of being a member of the labor force. Youth unemployment rates are especially high in Bulgaria, Israel, Ireland, Poland, and Slovenia. 2) They have a relatively low probability of being self-employed or a member of a trade union. In surveys, the young are particularly likely to say that they would like to be self-employed if they had the choice; they are less likely than others to report that trade unions in their country have too much power, and are more likely to say that trade unions are good for the country as a whole. 3) The young report being unusually happy with their lives. 4) They are especially likely to believe that the government has the responsibility for providing jobs for those who want them, and for controlling both wages and prices. 5) If unemployed, the young are especially likely to say how important they believe work is.

Bonnal, Fougère, and **Lollivier** present empirical evidence on how becoming employed depends on individuals' past employment histories. This stylized fact, characterizing the youth labor market in France, suggests that employers rank and select unemployed young workers on the basis of their past occurrences of employment and unemployment, rather than on the basis of how long their current unemployment spell is.

Abowd, Kramarz, Lemieux, and **Margolis** find that both the French and the American minimum wages are associated with relatively important effects on employment. As the French minimum wage increased from 1981 to 1989, more and more French workers—particularly young workers—left their jobs when their wage fell below the minimum. In the United States, a comparable effect released individuals *into* employment as their real wages passed a declining real minimum wage.

Gelot and **Osbert** point out that over the past 20 years, youth unemployment became the most noticeable fact in the French labor market. Since the 1970s, public intervention has changed the process of becoming employed for youth, and particularly for those young people who are least qualified, by broadening the role of public employment and vocational training. The Individualized Training Credit, set up in the fall of 1989, makes this new approach concrete, by extending access to skill development to the most disadvantaged young people between the ages of 16 and 25.

Requests for copies of these papers should be addressed to the NBER's Conference Department.

Effects of U.S. Trade Protection and Promotion Policies

A group of academics and other experts on trade met in Richmond, Virginia on October 6 and 7 for an NBER conference on the "Effects of U.S. Trade Protection and Promotion Policies." Robert C. Feenstra, director of the NBER's Program in International Trade and Investment, also of the University of California, Davis, organized the two-day program:

Robert E. Cumby, NBER and Georgetown University, and **Theodore H. Moran,** Georgetown University, "Testing Models of the Trade Policy Process: Do We Need a New Paradigm for the New Issues?"
Discussant:
Robert Z. Lawrence, NBER and Harvard University

Thomas J. Prusa, NBER and Rutgers University, "The Trade Effects of U.S. Antidumping Actions"
Discussant:
Robert W. Staiger, NBER and University of Wisconsin

Kimberly Ann Elliott, Institute for International Economics, and **J. David Richardson,** NBER and Syracuse University, "Determinants of U.S. 'Section 301' Actions"
Discussant:
Robert E. Baldwin, NBER and University of Wisconsin, Madison

James A. Levinsohn, NBER and University of Michigan, "CAR-WARS: Trying to Make Sense of U.S.–Japan Trade Frictions in the Automobile and Automobile Parts Markets"
Discussant:
Edward E. Leamer, NBER and University of California, Los Angeles

Kala Krishna, NBER and Pennsylvania State University, and **Marie C. Thursby,** NBER and Purdue University, "Whither Flat Panel Displays?"
Discussant:
Kenneth Flamm, Brookings Institution

(Continued on page 21)

Pinelopi K. Goldberg, NBER and Princeton University, and
Michael M. Knetter, NBER and Dartmouth College, "Causes and Consequences of the Export Enhancement Program for Wheat"
Discussant:
Howard D. Leathers, University of Maryland

David Weinstein, Harvard University, "Foreign Direct Investment and '*Keiretsu*': Rethinking U.S. and Japanese Policy"
Discussant:
Takatoshi Ito, International Monetary Fund

Andrew Dick, University of California, Los Angeles, "How (De)Regulation Shaped U.S.–Japan Trade in Telecommunications Equipment"
Discussant:
Lionel Olmer, Paul, Weiss, Rifkind, Wharton & Garrison

Bruce Blonigen, University of Oregon, and
Robert C. Feenstra, "Protectionist Threats and Foreign Direct Investment"
Discussant:
Lael Brainard, Council of Economic Advisers

Keith Head and
John Reis, University of British Columbia, "Market Access Effects of Trade Liberalization: Evidence from the Canada–U.S. Free Trade Agreement"
Discussant:
John F. Helliwell, NBER and Harvard University

Deborah L. Swenson, NBER and University of California, Davis, "Explaining Domestic Content: Evidence from Japanese and U.S. Auto Production in the United States"
Discussant:
G. Mustafa Mohatarem, General Motors

H. Gordon Hanson, NBER and University of Texas, "The Effects of Offshore Assembly on Industry Location: Evidence from U.S. Border Cities"
Discussant:
James Harrigan, University of Pittsburgh

The United States has ratified both NAFTA and the Uruguay Round, which together include sweeping trade liberalization measures. Simultaneously, those opposing trade liberalization or seeking new trade protection have battled with extraordinary intensity and some success. **Cumby** and **Moran** examine one of the most vigorously contested areas in the Uruguay Round, the case of establishing a framework for antidumping actions in the World Trade Organization. Here efforts at trade liberalization were not successful. In fact, there was an extension and codification of a new protectionist regulatory regime worldwide, leavened only by some modest reforms of existing procedures. The authors ask how this campaign on behalf of antidumping protectionism succeeded in the midst of a major tide flowing in the direction of liberalization, what it says about the process, and what it portends for trade battles to come.

Prusa analyzes the effectiveness of antidumping (AD) actions. Using a dataset based on line-item tariff codes, he examines the trade patterns of both countries named in the petitions and countries not subject to investigation. He finds first that AD cases are aimed primarily at restricting large competitors. Second, AD duties substantially restrict the volume of trade from named countries, especially for cases with high duties. Third, AD actions that are rejected still have an important impact on named country trade, especially during the period of investigation. Fourth, there is a substantial trade diversion from named to nonnamed countries, and the diversion is greater as the estimated duty grows larger. Because of the diversion of imports, the overall volume of trade continues to grow, even for those cases that result in duties. Fifth, despite the diversion of imports, AD law still has important effects, because it induces substantial import price increases both by named and by nonnamed countries. Finally, because of the diversion in imports, aggressive use of AD law by U.S. firms has the peculiar side-effect of benefiting nonnamed countries that are active in the areas of investigation.

Elliott and **Richardson** investigate the determinants of success and failure of Section 301 actions, extending the work of Bayard and Elliott (1994) by including an additional 15 cases to the 72 previously considered. They conclude, among other things, that the Bayard–Elliott findings are still relevant for the updated and expanded sample of cases. They also conclude that successful 301 cases are associated with a high share of GNP exported to the United States and a low U.S. trade balance with the target country. Section 301 cases about practices that make unfair distinctions at the border are far more successful than those about nonborder practices. By contrast, there is little difference in success rates between cases involving taxes and subsidies and those involving less transparent regulatory and nontax practices, nor between cases involving traditional trade concerns and those involving less well-established "new issues" (including trade in services and protection of intellectual property). There also is little difference between success rates in agricultural versus nonagricultural cases, nor among various trading partners.

Levinsohn explains that the recent trade frictions between the United States and Japan in the auto parts market are based on these facts: Initially, there was not much trade because Japanese cars were made in Japan with mostly Japanese parts; the same was generally true for North American cars. Most trade consisted of U.S. imports of Japanese parts, which contributed to a growing bilateral trade deficit in auto parts. In an effort to address this deficit, the United States threatened tariffs on 13 models of Japanese cars. This might seem like a very indirect way to address the parts trade, but more direct avenues were either ineffective or too costly. The threatened tariffs would have resulted in drastically reduced sales of the 13 models, and total Japanese profits would have fallen around 12.5 percent. The European firms would have captured many of the lost Japanese sales, and U.S. firms would have been pretty much unaffected by the tariffs. The result was an unenforced trade pact, in which Japan agreed to buy substantially more U.S. parts, and the United States agreed to drop the threatened tariffs. Thus there is a trade promotion pact, although it resulted from a threat of trade protection.

Krishna and **Thursby** examine the possible consequences of subsidies to R and D and to volume production proposed under the Clinton administration's flat panel display initiative. In their model, firms behave competitively in the short run, while realizing that their choices of capacity and yield-improving R and D in the medium and long run will affect market price. This model fits the actual configuration of the flat panel industry in 1994. Policy simulations show that steady-state yields and profits are lower, while prices are higher, with subsidies for capacity acquisition rather than with R and D subsidies. This is because a firm's incentives to undertake R and D are diminished by a subsidy on capacity costs.

Goldberg and **Knetter** study the causes and effects of the Export Enhancement Program (EEP) for wheat. They find that the overwhelming causes of the EEP—faltering export markets and swelling government stocks—are primarily attributable to the overvaluation of the dollar in the 1980s, not to the increase in EC subsidies to wheat farmers in 1985. They also find that the EEP has done little to restore export market shares since 1985 beyond what might have been expected as a result of the dollar's depreciation. Furthermore, the EEP does not appear to have increased U.S. domestic wheat prices relative to region-specific export prices.

Weinstein suggests that it is not cultural or institutional factors that produce *keiretsu*, or corporate groups, in Japan, but rather conventional government policy. In Japanese industrial policy, corporate groups form as a result of multibillion- and multitrillion-yen subsidy programs for politically powerful constituencies. Thus Weinstein concludes that we should reexamine the notion that conventional policies are not important. Further, the data suggest that levels of foreign direct investment into Japan are not nearly as out of line with international levels as is believed widely. More importantly, Weinstein argues, fairly conventional interventions generated the high levels of corporate ownership in Japan. It is these stable owners, and not *keiretsu*, that make takeovers difficult in Japan, he finds.

Dick explains how deregulation policies led to the telecommunications industry's bilateral (U.S./Japan) trade imbalance. He concludes first that the timing and scope of the trade imbalance coincided with major deregulatory actions in the United States; Japanese policy alternatively played neutral and reinforcing roles. Second, the impact of deregulation on trade ranged widely within the industry, Dick finds. Monopolies in terminal equipment, which had been sustained only by regulatory barriers to entry, were eroded quickly by differentials in international factor costs once regulation was lifted. Monopolies in network equipment, which were sustained additionally by economic barriers to entry, were eroded only when deregulation coincided with major advances in technology.

Blonigen and **Feenstra** analyze a panel dataset of four-digit SIC-level observations of Japanese foreign direct investment (FDI) in manufacturing into the United States in the 1980s. They find that higher threats of protection lead to greater FDI flows. A rise in the expected probability of protection from 5 to 10 percent means over a 30 percent increase in next-period FDI flows for an average industry, they estimate.

The Canada–U.S. Free Trade Agreement of 1988, while receiving much less attention in the United States than the follow-up agreement that included Mexico, drew adamant opposition in Canada. In the early 1990s, critics attributed the alleged loss of 350,000 Canadian manufacturing jobs to the elimination of tariffs between the countries. **Head** and **Reis** examine changes in Canada's shipments relative to U.S. shipments in 129 matched manufacturing industries. They find that most Canadian industries experienced relative declines from 1987 to 1992. The elimination of Canadian protection appears to be related to the declines; however, a deeper recession in Canada also contributed.

Swenson studies the domestic content decisions of automakers in the United States between 1984 and 1993, using foreign trade zone activity to observe individual sourcing and production. She shows that although the domestic content of Japanese firms is rising, differences are not being eliminated completely. Also, the apparent elasticity of substitution is lower for Japanese than for U.S. firms. These results suggest that transplant production may reduce the U.S. automotive deficit with Japan, but will not eliminate it.

Hanson examines how the growth of offshore assembly in Mexico has affected manufacturing activity in U.S. border cities. Under the offshore assembly provision of the U.S. tariff schedule, goods assembled abroad with U.S.-manufactured components receive preferential tariff treatment upon reentry into the United States. The majority of foreign assembly plants in Mexico, most of which are owned by U.S.-based multinationals, are concentrated along the border with the United States. After combining data on employment and earnings in two-digit manufacturing industries for the six largest U.S. border cities with data on employment and value added in foreign assembly plants in the six corresponding Mexican border cities, Hanson finds that the growth of export assembly in Mexico increases the demand for manufactured goods produced in U.S. border cities. The expansion of export-assembly plants in Mexican border cities explains over half of the increase in durable-goods activities in U.S. border cities from 1975–89.

Also participating in this conference were: Anne O. Krueger, NBER and Stanford University; Robert E. Lipsey, NBER and Queens College; and Suddhasatwa Roy, Purdue University. The papers presented, and their discussions, will be published by the University of Chicago Press. The release of this volume will be announced in an upcoming issue of the *Reporter*.

Regionalization of the World Economy

The NBER held a conference on the "Regionalization of the World Economy" on October 20 and 21. Jeffrey A. Frankel, director of the NBER's Program in International Finance and Macroeconomics, also of the University of California, Berkeley, organized the two-day program:

Alan Deardorff, University of Michigan, "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?"
Discussants:
Jeffrey Bergstrand, University of Notre Dame, and
Gene M. Grossman, NBER and Princeton University

Barry Eichengreen, NBER and University of California, Berkeley, and
Douglas A. Irwin, NBER and University of Chicago, "The Role of History in Bilateral Trade Flows"
Discussants:
Robert Z. Lawrence, NBER and Harvard University, and
Paul Wonnacott, University of Maryland, College Park

Carsten Kowalczyk, NBER and Tufts University, and
Donald Davis, Harvard University, "On Intrabloc Tariff Reform"
Discussants:
Arvind Panagariya, University of Maryland, and
Robert W. Staiger, NBER and University of Wisconsin

Antonio Spilimbergo and
Ernesto Stein, Inter-American Development Bank, "The Welfare Implications of Trading Blocs Among Countries with Different Endowments"
Discussants:
John Haveman, Purdue University, and
Edward E. Leamer, NBER and University of California, Los Angeles

John Whalley, NBER and University of Western Ontario, "Why Do Countries Seek Regional Trade Agreements?"
Discussants:
Eric Bond, Pennsylvania State College, and
Dani Rodrik, NBER and Columbia University

Jeffrey A. Frankel, and
Shang-Jin Wei, NBER and Harvard University, "Regionalization of World Trade and Currencies: Economics and Politics"

(Continued on page 24)

Discussants:
Philip Levy, Yale University, and
Marie C. Thursby, NBER and
Purdue University

Charles M. Engel, NBER and
University of Washington, and
John H. Rogers, Federal Reserve
Board of Governors, "Regional
Patterns in the Law of One Price:
The Roles of Geography Versus
Currencies"

Discussants:
Kenneth A. Froot, NBER and
Harvard University, and
Michael M. Knetter, NBER and
Dartmouth College

Deardorff derives equations for the value of bilateral trade from two extreme cases of the Heckscher–Ohlin Model. The first case is free trade, in which the absence of all barriers to trade in homogeneous products causes producers and consumers to be indifferent among trading partners. Resolving this indifference randomly, expected trade flows correspond exactly to the simple frictionless gravity equation if preferences are identical and homothetic, or if demands are uncorrelated with supplies. In the second case, countries produce distinct goods, either with complete specialization or with a variety of other models. The main lessons from the paper are first, that it is not difficult to justify even simple forms of the gravity equation from standard trade theories; and second, that because the gravity equation appears to characterize a large class of models, its use for empirical tests of any of them is suspect.

Eichengreen and **Irwin** investigate the degree to which history (in terms of past trade flows) continues to influence current trade flows. They analyze data for the immediate postwar period in order to concentrate on the effects of interwar trade patterns for the postwar development of trade, including the effects of postwar regional and global liberalization initiatives, such as the EEC and the GATT. They find that prewar trade patterns continue to shape the direction of international trade well into the postwar period, although the size and significance of the coefficient on lagged trade declines with the passage of time. Eichengreen and Irwin conclude that the standard formulation, which omits a role for historical trade flows, may be biased. Because there are reasons to anticipate a positive correlation between the predominant direction of trade flows in the past and membership in preferential arrangements in the present, there may be a tendency to spuriously attribute to preferential arrangements the effects of historical factors, and to exaggerate the influence of the former.

Kowalczyk and **Davis** discuss tariff phaseouts from theoretical, empirical, and historical perspectives. They find that high U.S. tariffs and little intraindustry trade are associated with long NAFTA phaseout periods for U.S. imports from Mexico. Mexico's phaseouts are correlated with those of the United States but not generally with Mexico's tariffs.

Spilimbergo and **Stein** present a model in which trade is motivated both by preference for variety and by comparative advantage. They use this framework to analyze the welfare implications of trading blocs among countries with different endowments and with and without transportation costs. They address the following issues: 1) the welfare implications of the consolidation of the world into a few trading blocs; 2) the different incentives that rich and poor countries have in choosing their partners in trade arrangements; and 3) whether the welfare consequences of continental preferential trade arrangements depend on relative endowments.

Whalley argues that regional trade arrangements around the world are surprisingly different from one another, in part because countries of different size are involved, and in part because they have different objectives. Some agreements have strategic underpinnings, and implicitly form part of security arrangements (as in Europe). Some are the outcome of smaller countries seeking to obtain more security in their access to larger country markets (as in the Canada–U.S. agreement). Some reflect agreements used by smaller countries to underpin their commitment to domestic policy reform (Mexico in NAFTA). Others reflect tactical considerations, conscious efforts to use prior regional agreements to influence subsequent multilateral negotiation (services in Canada–United States and in NAFTA). Some are stepping-stones to eventual deeper integration (the EEC in the 1960s), while others are consciously stand-alone, more shallow agreements (NAFTA). Whalley stresses the need to recognize the objectives countries get for their involvement in regional trade agreements when evaluating the impacts of any particular agreement.

Using the gravity model of bilateral trade and an updated dataset covering 1970–92, **Frankel** and **Wei** map out the current pattern of regionalization in trade. They also estimate the role of currency links within some major country groupings in promoting intragroup trade. Then, they review various political economy arguments that others have made regarding regionalism: for example, that it can help build political momentum for multilateral liberalization, or that it can undermine more general liberalization. They present a simple model illustrating one possible beneficial effect of trade blocs in building further trade liberalization. The result could go the other way just as easily, however. Frankel and Wei return to the gravity model estimates to tentatively assess whether the favorable or unfavorable political economy effects of regionalism are likely to dominate. Their tentative verdict is favorable: a majority of free trade agreements, such as ASEAN and Mercosur, have increased trade with nonmembers, even while they have concentrated trade disproportionately with each other.

Engel and **Rogers** find that the law of one price (LOOP) holds more nearly for country pairs that are within geographic regions than for country pairs that are not. Using disaggregated consumer price data from 23 countries, including data from eight North American cities, they find that failures of LOOP are related closely to nominal exchange rate variability, suggesting a link to sticky nominal prices. They also find that distance can explain failures of LOOP, suggesting that failures arise from imperfect market integration. However, these sources do not explain all of the failure of LOOP. They speculate that integrated marketing and distribution systems within regions cause LOOP to hold more nearly intraregionally.

Also participating in this conference were: NBER President Martin Feldstein, also of Harvard University; Anne O. Krueger, NBER and Stanford University; and Sang-Seung Yi, Dartmouth College. The papers presented, and their discussions, will be published by the University of Chicago Press. The release of this volume will be announced in an upcoming issue of the *Reporter*.

Tax Policy and the Economy

The NBER's tenth annual conference on "Tax Policy and the Economy" took place in Washington on November 7. James M. Poterba of MIT, who directs the NBER's research on taxation, organized this meeting:

Don Fullerton, NBER and University of Texas, "Environmental Tax Design"

Laurence J. Kotlikoff, NBER and Boston University, "Privatizing Social Security: How It Works and Why It Matters" (NBER Working Paper No. 5330)

Robert E. Hall, NBER and Stanford University, "Effects of Tax Reform on Relative Prices"

Martin Feldstein, NBER and Harvard University, and **Daniel R. Feenberg**, NBER, "The Effect of Increased Tax Rates on Taxable Income and Economic Efficiency: A Preliminary Analysis of the 1993 Tax Rate Increases"

Nada Eissa, NBER and University of California, Berkeley, "Tax Reforms and Labor Supply"

Fullerton discussed environmental taxes, and some flaws in their current design. Each environmental tax in the United States is designed to collect revenue for a trust fund used to clean up a particular pollution problem. Since there is a different tax for each trust fund, each tax rate is typically less than 1 percent. But there is also an administration and compliance cost involved, since taxpayers must read multiple sets of rules and fill out multiple forms. Fullerton showed that these compliance costs are high relative to the small amount of revenue raised from each tax. In addition, current U.S. environmental tax burdens are passed from the taxed industries to all other industries, he demonstrated. Thus the added cost of administering each separate tax neither achieves the targeted incentives nor lessens the targeted burdens.

Kotlikoff considered the issue of privatizing Social Security. He analyzed a proposal for privatizing the retirement component of Social Security, which he estimates can generate very major increases in output and living standards in the long run. These gains would come at the expense of existing generations, but not exclusively at their expense. Indeed, Kotlikoff showed that after existing generations have been compensated fully for their losses from privatization, future generations will be better off. When the initial tax structure features a progressive income tax, the linkage between benefits and taxes is low, a consumption tax is used to finance Social Security benefits during the transition to privatization, and existing generations are compensated fully for their privatization losses, there is still a 4.5 percent welfare gain for future generations, Kotlikoff estimated. If these circumstances don't hold, then the efficiency gains from privatization are likely to be smaller, and possibly even negative.

Hall discussed how various tax reforms might affect relative prices. All forms of consumption taxes have the same basic, desirable effect in the economy: they eliminate the distortion present in an income tax between current and future consumption. But different ways of administering consumption taxes have different effects in the long run, and especially during the transition, Hall explained. For example, sales taxes and value-added taxes (VATs) require a one-time increase in the price level, unlike the Hall–Rabushka flat tax and personal consumption taxes. The destination-basis VAT and national sales tax require a one-time appreciation of the dollar, a shock that other consumption taxes avoid. Generally, Hall pointed out, consumption taxes would impose a new tax on the rental value of owner-occupied housing, which might have a small adverse net effect on housing. This effect could be more than offset by the introduction of a personal housing deduction, he claimed.

Feldstein and **Feenberg** analyze taxpayer behavior after the 1993 increase in personal tax rates using data from recently released '93 tax returns. Their preliminary analysis confirms that taxable income is quite sensitive to marginal rates. As a result, the '93 tax rate increases raised only about one-third the revenue that would have been raised with no behavioral response. Further, Feldstein and Feenberg estimate that for every dollar of additional revenue collected by the government, taxpayers incurred a deadweight loss of three dollars because of induced changes in work, in the form of compensation, and in tax-deductible expenditures.

Eissa described her most recent work on the labor supply effects of tax reform. Research by Eissa and others shows that taxable income increased after the tax reforms of the 1980s, as did wages and salaries. Female labor supply increased as a result of these changes. But what about men, who remain the primary earners? Eissa finds that male participation in the labor force and total hours worked responded only slightly to the tax reforms, mostly after the Tax Reform Act of 1986 (TRA86). For example, total hours worked by men with more than 16 years of education increased by approximately 1 to 2 percent on average following TRA86, she finds.

The proceedings of this conference will be published in paperback by the MIT Press; the volume should be available in about six months. Individual papers can be ordered directly from the NBER.

Bureau News

Lucas Wins '95 Nobel

Robert E. Lucas, Jr., a research associate in the NBER's Program in Economic Fluctuations and professor of economics at the University of Chicago, won the Nobel Prize in Economics this year.

The Royal Swedish Academy of Sciences awarded the prize to Lucas for his "insights into the difficulties of using economic policy to control the economy." They called him "the economist who has had the greatest influence on macroeconomic research since 1970."

Lucas is the principal formulator of rational expectations theory, which shows how expectations about the future influence the economic decisions made by individuals, households, and companies. This theory assumes that people use available information about government policy when they make decisions. Thus, activist government policy to stabilize the economy, for example, could have either no effect, or could make matters worse.

Robert W. Fogel, another NBER research associate and professor of economics at the University of Chicago, won the prize in 1993. Other researchers who have been affiliated with the NBER over the years and won the Nobel Prize in Economics are Simon S. Kuznets, Milton Friedman, Theodore W. Schultz, George J. Stigler, and Gary S. Becker.

Lisa Lynch Becomes Chief Economist of Labor Department

Lisa M. Lynch, who has been affiliated with the NBER since September 1985 and most recently was a research associate in the Bureau's labor studies program, went on leave in September to become Chief Economist at the U.S. Department of Labor. Lynch also holds the William L. Clayton chair in International Economic Affairs at Tufts University's Fletcher School of Law and Diplomacy. At the Department of Labor, she replaces Alan B. Krueger, also an NBER research associate in the labor studies program, who has returned to Princeton University as a professor of economics.

Gruber Receives NSF Presidential Faculty Award

Jonathan Gruber, an NBER faculty research fellow who teaches at MIT, recently won a National Science Foundation Presidential Faculty Fellowship. There are 15 of these awards given in all of the sciences and social sciences; Gruber is the only social scientist to win one this year.

1995 Summer Institute

Over 800 economists from 194 universities and organizations around the world attended the NBER's 17th 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 27 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.

NBER Researchers on Congressional CPI Advisory Commission

A bipartisan congressional advisory commission, chaired by NBER Research Associate Michael J. Boskin, also of Stanford University, has calculated that in the recent past the Consumer Price Index (CPI) has overstated inflation by about one and a half percentage points per year. It also concluded that in the future, this bias is likely to be about one percentage point per year. Correcting this future bias could reduce the federal deficit by an estimated $634 billion over the next ten years. The CPI, which is calculated by the Bureau of Labor Statistics, is the inflation measure that serves as the basis for cost-of-living adjustments to Social Security and veterans' benefits, as well as income tax rate brackets and exemptions.

Other members of the "Advisory Commission to Study the Consumer Price Index" who are affiliated with the NBER are: Robert J. Gordon of Northwestern University, a research associate in the Bureau's productivity and economic fluctuations programs; and Zvi Griliches of Harvard University, a research associate and director of the NBER's Program on Productivity. Griliches, who has been interested in price measurement for many years, and Ernst R. Berndt of MIT, organized a special session at the 1995 NBER Summer Institute on "The CPI: Interpretation, Bias, Index of Escalation, and Issues Meriting Research." That day-long meeting brought NBER researchers together with representatives of the Bureau of Economic Analysis, Bureau of Labor Statistics, Bureau of the Census, and Federal Reserve Board to discuss the CPI.

Several of the commission's findings were based on previous Bureau research, including: *The Measurement of Durable Goods Prices,* edited by Robert J. Gordon, and published by the University of Chicago Press in 1990; *The Economics of New Goods,* edited by Gordon and Timothy Bresnahan, which is forthcoming from the University of Chicago Press; "Valuation of New Goods Under Perfect and Imperfect Competition," NBER Working Paper No. 4970 by Jerry A. Hausman; "Axiomatic and Economic Approaches to Elementary Price Indexes" and "Price and Volume Measures in a System of National Accounts," NBER Working Papers No. 5104 and 5103 by W. Erwin Diewert; and several NBER working papers by Berndt and Griliches, alone and with coauthors. The working papers may be ordered from the NBER's Publications Department; the books must be ordered directly from the University of Chicago Press.

New Directors Elected

At the fall meeting of the NBER's Board of Directors, three new directors were elected: George A. Akerlof, representing the University of California, Berkeley; William C. Dunkelberg, representing the National Association of Business Economists (NABE); and David B. Yoffie, representing Harvard University.

Akerlof is a professor of economics at Berkeley. He holds a B.A. from Yale University and a Ph.D. from MIT. He began his career as an assistant professor at Berkeley in 1966, was promoted to associate professor in 1970, and to professor in 1977. He was also the Cassel Professor with respect to Money and Banking at the London School of Economics in 1978–80. He has been an NBER research associate in the economic fluctuations and monetary economics programs.

Dunkelberg was president of NABE in 1993–4 and currently serves on its Board of Directors. He also has been chief economist of the National Federation of Independent Business since 1971. A professor of economics at Temple University and the director of that school's Center for Entrepreneurship, Dunkelberg holds a B.A., M.A., and Ph.D. from the University of Michigan. Before coming to Temple, he taught at Stanford University's Graduate School of Business and Purdue University's Krannert Graduate School of Management.

Yoffie is the Max and Doris Starr Professor of International Business Administration at Harvard Business School, where he has taught since 1981. He received his B.A. from Brandeis University, and his M.A. and Ph.D. from Stanford University. This academic year, he is a visiting scholar at Stanford's Graduate School of Business.

Improved Accessibility of the NBER's Historical Data

Daniel Feenberg, NBER, and Jeffrey A. Miron, NBER and Boston University

During the first several decades of its existence, the NBER assembled an extensive dataset that covers all aspects of the pre–World War I and interwar economies, including production, construction, employment, money, prices, asset market transactions, foreign trade, and government activity. Many of the series are highly disaggregated, and many exist at the monthly or quarterly frequency. The dataset has some coverage of the United Kingdom, France, and Germany, although it predominantly covers the United States.

When the data were collected, the NBER researchers copied them by hand from the original sources onto data sheets. In 1978, the Inter-University Consortium for Political and Social Research (ICPSR) transferred the data from the NBER's handwritten sheets to magnetic tape. Unfortunately, most macroeconomic researchers now use PCs rather than mainframes, so use of the tape is cumbersome. Moreover, the process of transferring the data from the NBER's handwritten sheets to the ICPSR tape introduced a number of mistakes.

We have used the NBER's original handwritten sheets to verify the data on the ICPSR tape, and we have converted the dataset to an accessible format. Our NBER Working Paper (No. 5186) of the same title provides details.

The revised and verified version of the NBER Macroeconomic History Database can be accessed only via the Internet. Point your browser at

gopher://nber.harvard.edu

or

http://nber.harvard.edu/macrohist.html

This is a WAIS searchable database, and you will be prompted for search terms. A catalogue of all series in the original dataset can be purchased from the NBER's Publications Department. The data are stored in the Micro-TSP .DB format. This format is pure ASCII and includes all documentation.

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Workshop on Macroeconomic History

Members and guests of the NBER's Project on Macroeconomic History met in Cambridge on October 13. NBER Research Associates Jeffrey A. Miron, Boston University, and Christina D. Romer, University of California, Berkeley, organized this program:

Christina D. Romer, "Why Did Prices Rise in the 1930s? Output Growth, Materials Prices, and the NRA"
Discussant:
Mark W. Watson, NBER and Princeton University

William D. Lastrapes and **George Selgin,** University of Georgia, "The Check Tax and the Great Contraction"
Discussant:
Frederic S. Mishkin, Federal Reserve Bank of New York

Allan H. Meltzer, Carnegie-Mellon University, "Why Did Monetary Policy Fail in the Thirties?"
Discussant:
Ben S. Bernanke, NBER and Princeton University

Kenneth A. Froot, NBER and Harvard University; **Michael Kim,** Pennsylvania State University; and **Kenneth S. Rogoff,** NBER and Princeton University, "The Law of One Price over 700 Years" (NBER Working Paper No. 5132)
Discussant:
William D. Nordhaus, NBER and Yale University

Hugh T. Rockoff, NBER and Rutgers University, "The Paradox of Planning in World War II"
Discussant:
Matthew D. Shapiro, NBER and University of Michigan

Peter Temin, NBER and MIT, "The 'Koreaboom' in West Germany: Fact or Fiction?"
Discussant:
J. Bradford De Long, NBER and University of California, Berkeley

Romer investigates the puzzling fact that prices rose during the mid- and late 1930s despite the extremely depressed level of output in those years. She shows that throughout the twentieth century, inflation has depended largely on the rate of growth of output, and that this growth-rate effect is largely attributable to the impact of output growth on materials prices. The inflation during 1934–42 was largely a consequence of the rapid growth of output during the recovery from the Great Depression, Romer finds. She also shows that the National Recovery Administration, by mandating cost-based pricing, weakened the usual effect that output's deviation from trend has on prices.

Although its role has been overlooked by monetary historians, a two cent tax on bank checks effective from June 1932 through December 1934 appears to have been an important contributing factor to that period's severe monetary contraction. According to estimates by **Lastrapes** and **Selgin,** the tax accounted for between 11 percent and 17 percent of the total increase in the ratio of currency to demand deposits, and for between 11 percent and 19 percent of the total decline in M1 between October 1930 and March 1933. The contractionary consequences of the check tax had been anticipated by many legislators, but they were unable to prevent the measure from being included in the Revenue Act of 1932.

Froot, Kim, and **Rogoff** examine annual data on commodity prices from England and Holland over a span of seven centuries. Their dataset incorporates prices for eight commodities—barley, butter, cheese, eggs, oats, peas, silver, and wheat—with pound/shilling nominal exchange rates going back, in some cases, to 1273. They find that the volatility and persistence of deviations from the law of one price have been remarkably stable over time. Those deviations are correlated highly across commodities (especially at annual horizons) and, for most pairwise comparisons in most centuries, are at least as volatile as relative prices across different goods within the same country. This analysis challenges the conventional view that the modern floating exchange rate experience is exceptional in terms of the behavior of relative prices (adjusted for exchange rates) across countries.

Historians have maintained for a long time that the key to the successful mobilization of resources in the United States during World War II was the Controlled Materials Plan instituted by the War Production Board in July 1943. However, a close look by **Rockoff** reveals that the plan had, at most, a very limited impact on trends in the production of munitions. This finding suggests that traditional interpretations of the role of "central planning" during the mobilization may be in need of revision.

Temin writes that a "Korea-boom" is thought to have taken place in West Germany immediately following the outbreak of the Korean War on June 26, 1950. However, the postwar German recovery was *not* beholden to fortuitous exogenous shocks, or at least not to that particular shock. Neither German exports nor American imports rose unusually at that time. Instead, Germany suffered an adverse price shock at the same time that its imports increased. The result was not a boom, but a balance-of-payments crisis. The fledgling European Payments Union acted swiftly to keep this small problem from escalating into a major economic or political crisis.

Also participating in this workshop were: Robert B. Barsky, NBER and University of Michigan; Olivier J. Blanchard, NBER and MIT; Mario Crucini, Ohio State University; Robert J. Gordon, NBER and Northwestern University; Richard Grossman, Wesleyan University; Christopher Hanes, University of Pennsylvania; Michael W. Klein, NBER and Tufts University; N. Gregory Mankiw, NBER and Harvard University; Mancur Olson, University of Maryland; Stefan Oppers, University of Michigan; Scott Sumner, Bentley College; Richard Sylla, NBER and New York University; and Alan Taylor, Northwestern University.

Program Meeting on Asset Pricing

Over 40 members and guests of the NBER's asset pricing program met in Chicago on October 13. Program Director John Y. Campbell, also of Harvard University, and John H. Cochrane, of NBER and the University of Chicago, organized the following program:

Blake D. LeBaron, NBER and University of Wisconsin, "Technical Trading Rule Profitability and Foreign Exchange Intervention"
Discussant:
Robert J. Hodrick, NBER and Northwestern University

Yacine Ait-Sahalia, NBER and University of Chicago, and **Andrew W. Lo,** NBER and MIT, "Nonparametric Estimation of State-Price Densities Implicit in Financial Asset Prices"
Discussant:
Lars P. Hansen, NBER and University of Chicago

David S. Bates, NBER and University of Pennsylvania, "Post-'87 Crash Fears in S&P 500 Futures Options"
Discussant:
Jiang Wang, NBER and MIT

Patricia M. Dechow and **Richard G. Sloan,** University of Pennsylvania, "Returns to Contrarian Investment: Tests of the Naive Expectations Hypotheses"
Discussant:
A. Craig MacKinlay, NBER and University of Pennsylvania

Kent Daniel, University of Chicago, and **David Marshall**, Federal Reserve Bank of Chicago, "Consumption-Based Modeling of Long-Horizon Returns"
Discussant:
Stephen G. Cecchetti, NBER and Ohio State University

John C. Heaton and **Deborah J. Lucas,** NBER and Northwestern University, "Savings Behavior and Portfolio Choice: Quantitative Theory"
Discussant:
George M. Constantinides, NBER and University of Chicago

There is reliable evidence that simple rules used by traders have some predictive value over the future movement of foreign exchange prices. **LeBaron** reviews some of this evidence and discusses the economic magnitude of this predictability. He then uses intervention data from the Federal Reserve to analyze the profitability of these trading rules in connection with central bank activity. His objective is to learn to what extent foreign exchange predictability can be confined to periods of either high or low central bank activity. His results indicate that after removing periods in which the Federal Reserve is active, exchange rate predictability is reduced dramatically.

Implicit in the prices of traded financial assets are Arrow–Debreu state prices or, in the continuous-state case, the state-price density (SPD) that may be used to price all assets, traded or nontraded. Using recently developed techniques in nonparametric analysis, **Ait-Sahalia** and **Lo** construct an estimator for the SPD implicit in financial asset prices, and derive an asymptotic sampling theory for this estimator to gauge its accuracy. They show that the SPD estimator can be extracted successfully from option prices, and present an empirical application to S&P 500 index options for which the SPD estimate and the corresponding nonparametic option pricing formula exhibit volatility "smiles" and other empirical regularities. Options with different times to expiration yield the family of SPDs over different horizons.

Bates shows that since the 1987 crash, implicit distributions have been skewed strongly negatively. He examines two competing explanations for this: stochastic volatility models with negative correlations between market levels and volatilities; and negative-mean jump models with time-varying jump frequencies. Using data on S&P 500 futures options for 1988–93, Bates confirms that shocks to volatility and level are correlated substantially negatively. Still, the stochastic volatility model explains implicit negative skewness of distributions only under extreme parameters that are implausible given the time-series properties of implicit spot variances. By contrast, the stochastic volatility/jump diffusion model generates substantially more plausible parameter estimates.

Dechow and **Sloan** test competing explanations for the higher stock returns generated by "contrarian" investment strategies, including naive expectations about future earnings growth and higher expected returns to compensate for risk. Unlike Lakonishok, Shleifer, and Vishny (1994), they find no systematic evidence that returns stem from naive extrapolation of past growth. Rather, consistent with Laporta (1995), they find that prices naively impound analysts' forecasts of future earnings growth. However, this accounts for only half of the returns to contrarian investment strategies. The remaining returns can be explained by estimates of expected return generated by a simple valuation model, the authors show.

Daniel and **Marshall** use coherence analysis and bandpass filtering analysis to show that, while there is a complete lack of correlation between asset returns and consumption growth at frequencies higher than about 0.7 years (or swings longer than 1.4 years), the coherence/correlation between the two series at cyclical frequencies is above 60 percent. They consider two consumption-based models of the asset-pricing kernel: the Abel's (1990) "Catching Up with the Joneses" preferences, and Constantinides's (1990) habit-formation preferences. They find that while neither model performs well at the quarterly horizon, both models perform fairly well when the horizon is lengthened to one or two years. In particular, the Hansen–Jagannathan restrictions are not violated, unconditional first- and second-moment restrictions are satisfied, the mean and variance of the conditional covariance between equity returns and the pricing kernel approximate the corresponding moments of the conditional equity premium, and variation in the conditional equity premium is reflected to some extent in variation in the conditional covariance series.

Heaton and **Lucas** examine the quantitative implications of a partial equilibrium model of portfolio choice in which investors face income risk that is not directly insurable. They consider the sensitivity of savings and portfolio allocation rules to different assumptions about the stochastic process for income and asset returns, and market frictions (transactions costs and short sale constraints). Under a certain assumption, their model predicts that investors borrow and invest all of their savings in stocks. This implication holds even with significant transactions costs in the stock market, and a wedge between the borrowing and lending rate. When preferences exhibit habit persistence, the model predicts that individuals hold some bonds as well as stocks. However, the model with habit persistence implies a substantial amount of trading in the stock market.

Project Meeting on Derivatives

Over 40 NBER researchers, academic economists, and policymakers met in Chicago on October 14 to discuss derivatives. John Y. Campbell, NBER and Harvard University, and Kenneth S. Rogoff, NBER and Princeton University, organized the day's agenda:

Gregory Duffee, Federal Reserve Board, "Estimating the Price of Default Risk"
Discussant:
Torben G. Andersen, Northwestern University

Cedomir Crnkovic and **Jordan Drachman,** J. P. Morgan, "A Universal Tool to Discriminate Among Risk Measurement Techniques"

Jose Lopez, Federal Reserve Bank of New York, "Evaluating the Predictive Accuracy of Volatility Models"
Discussants for both papers:
Yacine Ait-Sahalia, NBER and University of Chicago, and Barry Schachter, Office of the Comptroller of the Currency

Kenneth A. Froot, NBER and Harvard University, and **Jeremy C. Stein,** NBER and MIT, "Risk Management, Capital Budgeting, and Capital Structure Policy for Financial Institutions: An Integrated Approach"
Discussant:
René M. Stulz, NBER and Ohio State University

John Geanakoplos, Yale University; **Bill Zame**, University of California, Los Angeles; and **Pradeep Dubey,** State University of New York, Stony Brook, "Default, Collateral, and Derivatives"
Discussant:
José Scheinkman, University of Chicago

Duffee uses no-arbitrage models to estimate the price of default risk for 120 firms. With the cross-sectional (term structure) and time-series properties of corporate and Treasury bonds, he can estimate: probabilities of default; the volatilities of these probabilities; their cross-correlations; and the correlations of default probabilities with default-free interest rates. He finds that monthly shocks to investment-grade firms' probabilities of default are large, and are correlated positively across firms (typical correlations are about 0.3). However, these shocks are correlated only minimally with shocks to default-free rates. This implies that the assumption of independence between default probabilities and default-free rates is probably appropriate.

Crnkovic and **Drachman** have developed a tool that allows them to evaluate and compare different approaches to market risk measurement. Their paper describes the ideas behind the tool and illustrate some of its uses. They argue that the quality of any market risk measurement system is determined to a large degree by the method used to forecast the probability density functions of the market variables, and they describe a procedure for evaluating any such method.

The evaluations of volatility forecasts most meaningful to users of forecasts are those conducted under economically relevant loss functions. **Lopez** proposes a forecast evaluation framework that incorporates a general class of economic loss functions. The user's loss function specifies the three key elements of the evaluation framework: the economic events to be forecast; the criterion with which to evaluate those forecasts; and the subsets of the forecasts of particular interest. Volatility forecasts are transformed into probability forecasts of the specified events, and the probability forecasts are evaluated using statistical criteria, including probability scoring rules, tailored to the user's interests. Using exchange rates, Lopez illustrates the procedure and confirms that the choice of loss function directly affects the forecast evaluation results.

Froot and **Stein** develop a framework for analyzing the decisions about capital allocation and capital structure facing financial institutions. Their model incorporates two key features: 1) value-maximizing banks have a well-founded concern with risk management; and 2) not all the risks that banks face can be hedged frictionlessly in the capital market. This approach allows the authors to show how bank-level considerations about risk management should factor into the pricing of those risks that cannot be hedged easily. They examine several applications, including the evaluation of proprietary trading operations, and the pricing of unhedgeable derivatives positions.

Geanakoplos, Zame, and **Dubey** present a straightforward extension of general equilibrium theory that incorporates default and collateral, and thereby permits them to assess analytically the importance of these markets to the economy as a whole. They show that default and collateral, although they are suggestive of disequilibrium, pose no special technical problems: under the hypotheses on agent behavior and foresight that are standard in the general equilibrium literature, collateral and default equilibrium always exist. The main thesis here is that the scarcity of collateral exerts a powerful influence on the economy, inhibiting investment and risksharing, and creating incentives to find innovations that economize on collateral.

Labor Studies Program Meeting

Lawrence F. Katz, NBER and Harvard University, organized the fall meeting of the labor studies program, which was held in Cambridge on November 3. About 30 members and guests of the program discussed the following papers:

David E. Card, NBER and Princeton University, and **Philip Robins,** University of Miami, "Do Financial Incentives Encourage Welfare Recipients to Work? Early Findings from the Self-Sufficiency Project"

Joseph G. Altonji, NBER and Northwestern University, and **Charles Pierret,** Bureau of Labor Statistics, "Employer Learning and Statistical Discrimination"

Edward P. Lazear, NBER and Stanford University, "Culture and Language" (NBER Working Paper No. 5249)

Joseph Tracy, Columbia University, and **Peter Cramton,** University of Maryland, "The Use of Replacement Workers in Union Contract Negotiations: The U.S. Experience"

Alan B. Krueger, NBER and Princeton University, "Labor Market Shifts and the Price Puzzle Revisited"

Card and **Robins** evaluate an earnings subsidy program offered to long-term welfare recipients in two Canadian provinces. The program—known as the Self-Sufficiency Project—provides a subsidy equal to half the difference between an earnings target ($2500 or $3083 per month, depending on the province) and the individual's actual earnings. It is similar to a negative income tax with two important differences: first, eligibility is limited to former welfare recipients who find a full-time job (30 hours per week or more); second, the subsidy payment is based on individual earnings rather than family income. For a group of 2000 individuals observed over 18 months, early findings suggest that the financial incentives of the Self-Sufficiency Program significantly increase labor market attachment and significantly reduce welfare participation.

If profit-maximizing firms have limited information about the general productivity of new workers, they may choose to use easily observable characteristics, such as years of education or ethnic background, to "statistically discriminate" among workers. As firms acquire more information about a worker, they may become more dependent on actual productivity and less dependent on easily observable characteristics or credentials that predict productivity. **Altonji** and **Pierret** formalize these ideas and examine some of their empirical implications. They then show that even if employers learn about the productivity of new workers relatively slowly, the portion of the return to education that could reflect signaling of ability is limited.

Common culture and language facilitate trade and interaction among individuals. However, assimilation is less likely when an immigrant's native culture and language are represented broadly in his new country. Further, when governments protect minority interests directly, incentives to be assimilated into the majority culture are reduced. Both factors may explain the recent rise in multiculturalism. **Lazear** tests this theory and confirms it by examining U.S. Census data. He shows that the likelihood that an immigrant will learn English is related inversely to the proportion of the local population that speaks the immigrant's native language.

A structural change appears to have occurred in U.S. collective bargaining in the 1980s. **Tracy** and **Cramton** ask how the hiring of replacement workers explains this change. For a sample of over 300 major strikes since 1980, they estimate the likelihood of replacements being hired. They find that the risk of being replaced declines during tight labor markets, and is lower for bargaining units with more experienced workers. Further, the use of strikes decreases significantly as the predicted risk of replacement increases. Tracy and Cramton estimate that a ban on the use of replacement workers would have increased the incidence of strikes from 1982–9 by 3 percentage points, a 30 percent increase.

Krueger examines the relationship between price growth and skill intensity across 150 manufacturing industries between 1989 and 1995. He finds that wage growth and increases in intermediate goods prices are passed through to final product prices roughly in proportion to their factor shares. Second, product prices have grown relatively less in sectors that use less-skilled labor more intensively. That finding is consistent with the Stolper–Samuelson theory of expanded trade with countries that are abundant in less-skilled workers, as well as with some models of technological change.

Additional Papers

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"Reports of the Dollar's Death Are Greatly Exaggerated," by **Jeffrey A. Frankel.** This paper is forthcoming, under the title, "Still the Lingua Franca: The Exaggerated Death of the Dollar," in *Foreign Affairs,* 74, no. 4, July/August 1995.

"European Integration and the Regionalization of World Trade and Currencies: The Economics and the Politics," by **Jeffrey A. Frankel** and **Shang-Jin Wei.** This paper is forthcoming in *Monetary and Fiscal Policy in an Integrated Europe,* edited by Barry Eichengreen, Jeffry Frieden, and Jurgen von Hagen, from Springer-Verlag Press, New York and Heidelberg, 1995.

"Foreign Direct Investment and Politics: The Swedish Model," by **Magnus Blomström** and **Ari Kokko.**

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1969. "Precautionary Saving and Social Insurance," by **R. Glenn Hubbard, Jonathan S. Skinner,** and **Stephen P. Zeldes** (NBER Working Paper No. 4884)

1970. "Following in Her Footsteps? Faculty Gender Composition and Women's Choices of College Majors," by **Brandice J. Canes** and **Harvey S. Rosen** (NBER Working Paper No. 4874)

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1980. "A Retrospective on the Debt Crisis," by **Michael P. Dooley** (NBER Working Paper No. 4963)

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NBER Macroeconomics Annual 1995

The ***NBER Macroeconomics Annual 1995,*** edited by Ben S. Bernanke and Julio J. Rotemberg, is available from the MIT Press for $20.00 in paperback or $40.00 in clothbound version. This is the tenth in a series of annuals designed to stimulate research on problems in applied macroeconomics, to bring frontier theoretical developments to a wider audience, and to accelerate the interaction between analytical and empirical research in macroeconomics.

Among the topics discussed in this volume are: wage inequality and regional unemployment; capital utilization and returns to scale; banks and derivatives; exchange-rate-based stabilizations; and inflation indicators and policy.

Bernanke and Rotemberg are both research associates in the NBER's economic fluctuations program. Bernanke is also a professor at the Woodrow Wilson School of Public and International Affairs at Princeton University. Rotemberg is a professor at the Sloan School of Management, MIT, and Harvard Business School.

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Individual and Social Responsibility

Individual and Social Responsibility: Child Care, Education, Medical Care, and Long-Term Care in America, edited by Victor R. Fuchs, will be available from the University of Chicago Press this fall. This volume is the result of an NBER conference in late 1994 that brought together applied and theoretical economists, lawyers, physicians, and social scientists to discuss issues in the provision of human services. Priced at $55.00, the book should be of interest to a broad spectrum of readers, and not just to academic economists.

Fuchs is a research associate in, and former director of, the NBER's Program in Health Care. He is also Henry J. Kaiser, Jr. Professor Emeritus at Stanford University.

The Industrial Organization and Regulation of the Securities Industry

The Industrial Organization and Regulation of the Securities Industry, edited by Andrew W. Lo, now may be ordered from the University of Chicago Press for $59.95. In recent years, regulation has played a crucial role in a number of industries, including the airlines, telecommunications, transportation, and public utilities. However, despite a plethora of studies of and headlines about the securities industry, surprisingly little has been written about the industrial organization and regulation of that industry. This volume represents a step in that direction, and should interest both economists and participants in the securities markets.

Lo is a research associate in the NBER's Program in Asset Pricing and the Harris & Harris Group Professor of Finance at MIT's Sloan School of Management.

Works Councils

Works Councils: Consultation, Representation, and Cooperation, edited by Joel Rogers and Wolfgang Streeck, is a comprehensive study of various employee representation and consultation agreements in Europe and North America. The countries studied include Germany, the Netherlands, France, Spain, Sweden, Italy, Poland, Canada, and the United States. This volume is part of the NBER Comparative Labor Markets Series.

Works Councils is available now from the University of Chicago Press, and priced at $55.00. Both authors are at the University of Wisconsin, Madison, where Rogers is professor of law, political science, and sociology, and Streeck is professor of sociology and industrial relations.

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NBER Working Papers

Rising Public College Tuition and College Entry: How Well Do Public Subsidies Promote Access to College?

Thomas J. Kane

NBER Working Paper No. 5164
July 1995
JEL Nos. I20, I28
Labor Studies

Although economists have spent the past decade analyzing the rising payoff to schooling, they know much less about how youth responds to that payoff, or how effective policies aimed at influencing those decisions are. Yet state and federal governments currently spend more than $53 billion annually, hoping to promote greater access to college. Using several sources of variation in costs, this paper evaluates the price sensitivity of youth regarding schooling. Most of the evidence points to large impacts on enrollment, particularly for low-income students and for those attending two-year colleges.

The states have chosen to promote enrollment in college by keeping tuition low through across-the-board subsidies rather than by using more targeted, means-tested aid. As public enrollments increase, this becomes an expensive strategy. However, the evidence on enrollment responses to means-tested aid is much weaker than the response to broad subsidies. After a federal means-tested grant program was established in 1973, for example, there was no disproportionate increase in college enrollment by low-income youth.

Leverage, Investment, and Firm Growth

Larry Lang, Eli Ofek, and René M. Stulz

NBER Working Paper No. 5165
July 1995
Asset Pricing, Corporate Finance

We show that there is a negative relationship between leverage and future growth at the firm level, and for diversified firms at the segment level. Further, this negative relationship holds for firms with low Tobin's q, but not for firms with a high q, or in high-q industries. Therefore, leverage does not reduce growth for firms known to have good investment opportunities, but it is negatively related to growth for firms whose opportunities either are not recognized by the capital markets or are not sufficiently valuable to overcome the effects of their debt overhang.

Why Is There a Home Bias? An Analysis of Foreign Portfolio Equity Ownership in Japan

Jun-Koo Kang and René M. Stulz

NBER Working Paper No. 5166
July 1995
Asset Pricing, Corporate Finance

We use data on foreign stock ownership in Japan from 1975 to 1991 to examine the determinants of the home bias in portfolio holdings. Existing models of international portfolio choice that predict that foreign investors hold national market portfolios, or portfolios tilted toward stocks with high expected returns, are inconsistent with the evidence we provide. We show that foreign investors place too much weight on shares of firms in manufacturing industries, large firms, firms with good accounting performance, firms with low unsystematic risk, and firms with low leverage. Controlling for size, it appears that small firms that export more have greater foreign ownership. Foreign investors do not perform significantly worse than if they held the Japanese market portfolio, however. After controlling for firm size, we find no evidence that foreign ownership is related to expected returns of shares. We show that a model with size-based informational asymmetries and deadweight costs can yield asset allocations consistent with our evidence.

The Limits of Arbitrage

Andrei Shleifer and Robert W. Vishny

NBER Working Paper No. 5167
July 1995
Asset Pricing

In traditional models, arbitrage in a given security is performed by a large number of diversified investors taking small positions against its mispricing. In reality, however, arbitrage is conducted by a relatively small number of highly specialized investors who take large positions using other people's money. Such professional arbitrage has a number of interesting implications for security pricing, including the possibility that it becomes ineffective in extreme circumstances, when prices diverge far from fundamental values. The model also suggests where anomalies in financial markets are likely to appear, and why arbitrage fails to eliminate them.

Protection and the Business Cycle

Kyle Bagwell and Robert W. Staiger

NBER Working Paper No. 5168
July 1995
JEL No. F13
International Trade and Investment

Empirical studies repeatedly have documented the countercyclical nature of trade barriers. In this paper, we propose a simple theoretical framework consistent with this and other empirical regularities in the relationship between protection and the business cycle. We examine how countries can maintain efficiency-enhancing reciprocal trade agreements that control their temptation to resort to beggar-thy-neighbor policies, requiring that such agreements be self-enforcing. We find theoretical support for countercyclical movements in levels of protection as the rapid growth in trade volume that is associated with a boom phase facilitates the maintenance of more liberal trade policies that are sustainable during a recession phase with slow growth. However, we also find that acyclical increases in the level of trade volume give rise to protection, implying that whether rising imports are met with greater liberalization or increased protection depends on whether they are part of a cyclical upward trend in trade volume or an acyclical increase in import levels.

Worker Adaptation and Employer Accommodation Following the Onset of a Health Impairment

Mary C. Daly and John Bound

NBER Working Paper No. 5169
July 1995
JEL Nos. J14, J26
Aging, Labor Studies

Using data from the new Health and Retirement Survey, we investigate the responses of workers and their employers to the onset of work-limiting health impairments. We find that many workers who suffer from health limitations are accommodated directly by their employers: those who do not receive direct accommodation frequently adapt to their limitations by altering their job demands or by changing jobs. These findings point to the potential for adjustments on both sides of the market: by employers, in the form of job accommodation, and by employees in the form of job change.

Industry or Class Cleavages Over Trade Policy? Evidence from the British General Election of 1923

Douglas A. Irwin

NBER Working Paper No. 5170
July 1995
International Trade and Investment

Economists and political scientists frequently have attempted to determine whether political action related to trade policy takes place along factor lines (such as capital versus labor, as implied by the Stolper–Samuelson theorem) or along industry lines (as implied by models with imperfect factor mobility). This paper examines voting patterns in the British general election of 1923, which hinged on free trade versus protection. This election provides an opportunity to distinguish between the two hypotheses, because either an industry or a factor alignment among voters is plausible: rigidities in the interwar labor market often have been discussed, and electoral politics often has been viewed as having a class basis. I exploit data from the British census of 1921, which divides the population into categories of occupation (by industry) and economic class (by income and/or skill level), and relate these data to cross-county variation in voting for the contending political parties. My results indicate that county differences in the occupational structure of the electorate account for the election outcome better than differences in class structure.

Tax Shelters and Passive Losses After the Tax Reform Act of 1986

Andrew A. Samwick

NBER Working Paper No. 5171
July 1995
JEL Nos. H24, E62
Public Economics

The precipitous decline in tax sheltered investments after the Tax Reform Act of 1986 (TRA) is attributed widely to the passive loss rules. These rules disallowed losses from activities in which the taxpayer did not participate materially as a current deduction against all sources of income except for other passive activities. This paper demonstrates instead that the role of the passive loss limitations was secondary to that of other reforms enacted by TRA, most importantly the repeal of the investment tax credit and the exclusion of long-term capital gains. These other reforms not only lowered aftertax rates of return on tax sheltered investments, but also eliminated the positive correlation between the investor's marginal tax rate and the investment's aftertax rate of return. As a result, high income taxpayers ceased to be the natural clientele for legitimate tax shelters after TRA. The passive loss rules were more effective in curtailing the use of "abusive" tax shelters; however, a more narrowly focused restriction on seller financing of tax sheltered investments could have accomplished the same goal with much less scope for discouraging productive economic investments.

The Term Structure of Interest Rates in a Pure Exchange Economy with Heterogeneous Investors

Jiang Wang

NBER Working Paper No. 5172
July 1995
Asset Pricing

This paper presents an equilibrium model of the term structure of interest rates when investors have heterogeneous preferences. The basic model considers a pure exchange economy of two classes of investors with different (but constant) relative risk aversion, and gives closed-form solutions to bond prices. I use the model to examine the effect of heterogeneity of preference in the behavior of bond yields. I also consider extensions to cases of more than two investors.

The Seasonality of Consumer Prices

Michael F. Bryan and Stephen G. Cecchetti

NBER Working Paper No. 5173
July 1995
JEL Nos. E31, E32
Monetary Economics

In this paper, we reevaluate the evidence of seasonality in prices which we find to be substantially greater than previous research has indicated. That is, seasonal price movements have become more prominent in the relatively stable inflation environment that has prevailed since 1982.

We draw one main conclusion from this analysis: the amount of seasonality in prices differs greatly by item, making it difficult to generalize about seasonal price movements. A casual reading fails to reveal one easily identifiable origin of the seasonal variation of prices. That is, seasonality in consumer prices is predominantly idiosyncratic in nature, a result that contrasts with studies demonstrating a common seasonal cycle in real economic variables.

This finding has an important practical implication: given the selective, disaggregated approach taken by the Bureau of Labor Statistics to adjust data seasonally, the existence of idiosyncratic seasonality increases the likelihood of allowing noise in the aggregate CPI at a seasonal frequency. This argues in favor of seasonally adjusting the index after aggregation.

Is an Integrated Regional Labor Market Emerging in East and Southeast Asia?

David E. Bloom and Waseem Noor

NBER Working Paper No. 5174
July 1995

International Trade and Investment, Labor Studies

We examine labor market integration in east and southeast Asia (ESEA) during the 1980s, focusing on intraregional labor mobility and the two other main channels of integration: capital mobility and trade. We find that labor market integration increased sharply among ESEA countries in the 1980s, with 9 percent of ESEA's labor force participating in cross-national labor market transactions in 1991, either directly via labor mobility or indirectly via capital mobility or trade, up from just 5.2 percent in 1980. We also find that trade is the dominant mechanism through which regional labor market integration occurred in the 1980s, with labor migration contributing only modestly to the process.

Nontraded Goods, Nontraded Factors, and International Nondiversification

Marianne Baxter, Urban J. Jermann, and Robert G. King

NBER Working Paper No. 5175
July 1995
JEL No. F21
International Finance and Macroeconomics

Can the presence of nontraded consumption goods explain the high degree of "home bias" in investor portfolios? No, so long as individuals have access to free international trade in financial assets, we find. In particular, it is *never* optimal to exhibit home bias with respect to domestic traded-good equities. By contrast, an optimal portfolio may exhibit substantial home bias with respect to nontraded-good equities, although this result requires a very low degree of substitution between traded and nontraded goods in the utility function. Further, our analysis uncovers a second puzzle: the composition of investors' portfolios appears to be strongly at variance with the predictions of the model that incorporates nontraded goods.

Should the Stagnant Homeownership Rate Be a Source of Concern?

Richard K. Green

NBER Working Paper No. 5176
July 1995
JEL No. R21

The homeownership rate in the United States was essentially stagnant during the 1980s. This stagnation should be a source of concern if it reflects stagnant economic conditions and ownership opportunities, not if it simply reflects changing demographic conditions or preferences.

Using a series of affordability measures, I find that homeownership opportunities improved almost everywhere during the 1980s, suggesting that the cause of the stagnation rate was something other than economic conditions. In fact, I find that both demographics and changes in preferences led to an increase in the proportion of households headed by single people; all else being equal, this would tend to push the owner-occupancy rate downward. I also find that while homeownership opportunities improved during the 1980s, the ex ante use cost of owning a home increased almost everywhere, reducing the financial attractiveness of owning a home. The combination of improving affordability and worsening financial appeal had an overall neutral effect on the aggregate ownership rate.

In Search of Empirical Evidence That Links Rent and User Cost

Dixie M. Blackley and James R. Follain

NBER Working Paper No. 5177
July 1995

Most models of the rental housing market assume a close linkage between the level of residential rents and the aftertax user cost of rental housing capital. However, little empirical evidence exists to establish the strength of this linkage, or the speed with which rents adjust to changes in user cost or tax policy. In order to shed light on both of these issues, this paper develops and estimates an econometric model of the rental housing market. We use U.S. annual data for 1964 through 1993 to generate two-stage least squares estimates of a four-equation structural model.

Although our results are generally consistent with expectations and reveal several interesting relationships among the system variables, we fail to identify a strong relationship between rent and user cost. About half of an increase in user cost ultimately is passed along as higher rent. The adjustment process also takes a long time, with only about a third of the long-run effect realized within 10 years of a user cost shock. The fundamental reason for this result is that our estimate of the user cost series, based upon widely accepted procedures, is much more volatile than the residential rent series.

Risk-Based Capital Standards and the Riskiness of Bank Portfolios: Credit and Factor Risks

Steven R. Grenadier and Brian J. Hall

NBER Working Paper No. 5178

July 1995

Bank risk-based capital (RBC) standards require banks to hold different amounts of capital for different classes of assets, based almost entirely on credit risk. This paper provides both a theoretical and an empirical framework for evaluating such standards. We present a model outlining a pricing methodology for loans subject to default risk. The model shows that the returns on such loans are affected by the complicated interaction among the likelihood of default, the consequences of default, term structure variables, and the pricing of factor risks in the economy. When we examine whether the weights on risk accurately reflect the risk of bank assets, we find that they fail even in their limited goal of correctly quantifying credit risk. For example, our findings indicate that the RBC weights overpenalize home mortgages, which have an average credit loss of 13 basis points, relative to commercial and consumer loans. The RBC rules also contain a significant bias against direct mortgages relative to mortgage-backed securities. In addition, we find large differences in the credit riskiness of loans within the 100 percent weight class, and potentially large benefits to loan diversification, neither of which is considered in the RBC regulations. We also examine other types of bank risk by estimating a simple factor model that decomposes loan risk into term structure, default, and market risk. One implication of our findings is that although banks have reallocated their portfolios in ways intended by the RBC standards, they may merely have substituted one type of risk (term structure risk) for others (default and market risk), of which the net effect is unknown.

Expectations, Efficiency, and Euphoria in the Housing Market

Dennis R. Capozza and Paul J. Seguin

NBER Working Paper No. 5179
July 1995
JEL Nos. R21, G14

We study expectations of capital appreciation in the housing market. Expectations impounded in the rent/price ratio at the beginning of the decade successfully predict appreciation rates, we find, but only if we control first for cross-sectional differences in the quality of rental versus owner-occupied housing. We also demonstrate that observed rent/price ratios contain a disequilibrium component that has the power to forecast subsequent rates of appreciation. Finally, we provide evidence consistent with euphoria: participants in housing markets appear to overreact to income growth.

The Effect of Income and Collateral Restraints on Residential Mortgage Terminations

Wayne Archer, David C. Ling, and Gary A. McGill

NBER Working Paper No. 5180
July 1995
JEL No. G12

The prepayment behavior of home mortgage borrowers is inconsistent with behavior implied by classical option theory. In attempting to explain the anomaly, a substantial literature has emerged examining the problem, focusing on the characteristics of the mortgage and on the historic path of interest rates. We contribute to that literature in three respects. First, we explore the influence of household level characteristics on prepayment behavior, using both householder characteristics and collateral (house) value. Second, we empirically recognize important interactions between the status of the prepayment option and the influence of income and collateral constraints on prepayment behavior. Third, we use a major source of data that has not been used previously in examining the prepayment anomaly: the American Housing Survey.

Among our findings are: when the household is either collateral constrained or income constrained, or the option is likely to be "out of the money," the influence of the option value on prepayment behavior is half as large. When the status of the option and the influence of potential household constraints are recognized more appropriately, they account for nearly all explanatory power otherwise attributable to household demographic characteristics.

Residential Mobility and Mortgages

Sewin Chan

NBER Working Paper No. 5181
July 1995
JEL Nos. J60, G12

Mortgage applications are a detailed and accurate source of household information that is verified by underwriters, making them a more accurate data source than self-reported survey responses. This paper discusses how mortgage data can be applied to areas of economics outside of mortgage finance. As a supplement to variables from the application form, the self-selection of mortgage points can infer expected mobility. I estimate a duration model of housing spells, and the points indicator is highly significant in predicting mobility for low loan-to-value borrowers. These findings demonstrate the potential fruitfulness of using this new data source.

Housing Price Dynamics Within a Metropolitan Area

Karl E. Case and Christopher J. Mayer

NBER Working Paper No. 5182
July 1995
JEL Nos. R12, R21

This paper analyzes the pattern of cross-sectional house price appreciation in the Boston metropolitan area from 1982 to 1994. The empirical results are consistent with many of the predictions of a standard urban model in which towns have a fixed set of locational attributes and amenities. In particular, the evidence suggests that house prices in towns with a large share of residents working in the manufacturing sector in 1980 grew less quickly in the ensuing years when aggregate manufacturing employment fell. As baby boomers moved into middle age, house values appreciated faster in towns with a larger initial percentage of middle-aged residents. Housing values rose more slowly in towns that allowed additional construction, and values rose faster in towns closer to Boston. Finally, as fewer families had children who attended public schools statewide, the price premium associated with housing in towns with good schools fell. All of these findings support the view that town amenities and public services are not easily replicated or quickly adaptable to shifts in demand, even within a metropolitan area.

House Prices and Homeowner Saving Behavior

Gary V. Engelhardt

NBER Working Paper No. 5183
July 1995
JEL Nos. E21, R31

This paper examines the empirical link between appreciation in house prices and the savings behavior of homeowners during the 1980s. I use household asset and debt data taken from the 1984 and 1989 waves of the Panel Study of Income Dynamics for a sample of homeowning households with members under age 65 to construct changes in real household wealth as a measure of household saving behavior. I use variation in housing market conditions across time and regions to identify savings effects.

My analysis suggests that the estimated marginal propensity to consume out of real housing capital gains is 0.03 for the median household saver. However, there is an asymmetry in the saving response to both total and unanticipated real capital gains on housing. All of the savings offset comes from households that experience real capital losses on housing. Households that experience real gains do not change their saving behavior. The existence of this asymmetry casts doubt on the power of changes in house prices to explain the time-series path of saving in the United States.

Mortgage Default and Low Downpayment Loans: The Costs of Public Subsidy

Yongheng Deng, John M. Quigley, and Robert Van Order

NBER Working Paper No. 5184
July 1995
JEL Nos. H29, G12

This paper presents a unified model of the default and prepayment behavior of homeowners in a proportional hazard framework. The model uses the option-based approach to analyze default and prepayment, and considers these two interdependent hazards as competing risks.

The results indicate the sensitivity of default to the initial loan-to-value ratio of the loan and the course of housing equity. The latter is a measure of the extent to which the default option is "in the money." The results also indicate the importance of trigger events, namely unemployment and divorce, in affecting prepayment and default behavior.

We use the empirical results to analyze the costs of a current policy proposal: stimulating homeownership by offering low-downpayment loans. We simulate default probabilities and costs on zero-downpayment loans, and compare them to conventional loans with conventional underwriting standards. Our results indicate that if zero-downpayment loans were priced as if they were mortgages with 10 percent downpayments, then the additional program costs would be 2 to 4 percent of funds made available, when housing prices increase steadily. If housing prices remain constant, the costs of the program would be much larger indeed. Our estimates suggest that additional program costs could be between $74,000 and $87,000 per million dollars of lending. If the expected losses from such a program were not priced at all, the losses from default alone could exceed 10 percent of the funds made available for loans.

The Impact of Immigration on American Labor Markets Prior to the Quotas

Timothy J. Hatton and Jeffrey G. Williamson

NBER Working Paper No. 5185
July 1995
Development of the American Economy, Labor Studies

Current debate on the impact

and assimilation of immigrants into the American labor market sounds remarkably like the debate that eventually triggered the imposition of the quotas in the 1920s. Then as now, observers failed to agree on exactly what the impact of the mass migration was on labor markets. Despite its relevance to current discussion, there has been almost no quantitative effort to assess late-19th-century impact, while analysis instead has been obsessed with assimilation issues. This paper redresses this imbalance by confronting three questions that are just as relevant today as they were almost a century ago: Did late-19th-century American immigrants act as a flexible (guestworker) labor supply? Did they flow into occupations in which job creation was fast, or did they displace natives in occupations in which job creation was slow? Did immigrants reduce the growth of wages and living standards for natives while increasing their unemployment?

Improving the Accessibility of the NBER's Historical Data

Daniel R. Feenberg and Jeffrey A. Miron

NBER Working Paper No. 5186
July 1995
JEL Nos. C82, E32, N12
Economic Fluctuations, International Finance and Macroeconomics, Monetary Economics

During the early years of its existence, the National Bureau of Economic Research assembled an extensive dataset on all aspects of the pre–World War II macroeconomy. Until 1978, this dataset existed only on the handwritten sheets to which the early NBER researchers copied the data from original sources. In 1978, the Inter-University Consortium for Political and Social Research (ICPSR) transferred the data to magnetic tape.

A number of researchers have used the ICPSR tape, but two key problems discourage many from taking advantage of this unique dataset: First, modern econometric software does not have the ability to read the obsolete ICPSR format. Second, the process of transferring the data from the NBER's handwritten sheets to the ICPSR tape introduced a number of mistakes. We have eliminated these two impediments to the use of the NBER dataset by converting the ICPSR tape to a portable format, and by verifying the accuracy of the data using the NBER's original handwritten sheets. The dataset is now available on the Internet, and can be accessed using standard gopher or web-browser software.

Strategic Trading in a Two-Sided Foreign Exchange Auction

Linda Goldberg and Rafael Tenorio

NBER Working Paper No. 5187
July 1995
International Finance and Macroeconomics

The microstructure chosen for foreign exchange markets can influence trading volumes and equilibrium exchange rates. With emerging markets and developing countries increasingly using two-sided auctions, the choice of the discrete "tatonnement" auction creates incentives for strategic behavior among market participants. We theoretically predict strategic underevelation of demand or supply positions that are supported empirically with detailed data from a rare example of a tatonnement market: the Moscow Interbank Currency Exchange. Our results also are consistent with findings from experimental work on auctions: new entrants alter strategic behavior mainly on the market's demand side, without comparable implications for the supply side. We also show that bids and offers are influenced by fundamentals and specific policy measures.

Career and Family: College Women Look to the Past

Claudia Goldin

NBER Working Paper No. 5188
July 1995
JEL Nos. J1, J2
Development of the American Economy, Labor Studies

Recent college graduate women express frustration regarding the obstacles they will face in combining career and family. Tracing the demographic and labor force experiences of four cohorts of college women across the past century allows us to observe the choices each made, and determine how the constraints facing college women have loosened over time.

No cohort of college graduate women in the past had a high success rate in combining family and career. Cohort I (graduating c. 1910) had a 50 percent rate of childlessness. Cohort III (graduating c. 1955) had a high rate of childbearing, but initially low labor force participation. Cohort IV (graduating c. 1972) provides the most immediate guide for today's college women, and is close to the end of its fertility history. It is also a cohort that can be studied using the National Longitudinal Survey of Young Women.

In 1991, when the group was between 37 and 47 years old, 28 percent of the college graduate (white) women had yet to have a first birth. An estimated 24 percent to 33 percent of the college graduate women in the sample had a career. Thus, only 13 percent to 17 percent of the group achieved "family and career" by the time it was about 40 years old. Among those who attained career, 50 percent were childless. Cohort IV contains a small group of women who have combined family with career, but for most the goal remains elusive.

Taxation and Corporate Investment: The Impact of the 1991 Swedish Tax Reform

Alan J. Auerbach, Kevin Hassett, and Jan Södersten

NBER Working Paper No. 5189
July 1995
JEL Nos. H32, E62
Public Economics

In 1990, the government of Sweden introduced a major tax reform to take effect in 1991. Prior to the legislation, the Swedish system was so complex that the likely effects of the reform on incentives to invest were unknown.

In this paper, we draw on Södersten (1989) and Auerbach and Hassett (1992) to derive an expression for the user cost of capital that captures the essential features of the Swedish tax code both before and after the reform. We estimate the model for investment in equipment, and find that the responsiveness of Swedish firms to the user cost is quite similar to what is found for the United States. Finally, we use our model and our estimates to assess the effects of the 1991 reform. We find that the impact of the reform on investment was probably minor, and had little to do with the contemporaneous sharp drop in investment.

Why Are Retirement Rates So High at Age 65?

Robin L. Lumsdaine, James H. Stock, and David A. Wise

NBER Working Paper No. 5190
July 1995
JEL Nos. J14, J26
Aging, Labor Studies

In most datasets of labor force participation of the elderly, retirement rates are particularly high at age 65. While there are numerous economic reasons why individuals may choose to retire at 65, empirical models that have attempted to explain the spike at age 65 have met with limited success. Interpreted another way, while many models would predict a jump in the hazard rate at age 65, the magnitude of the spike indicates excessive response, given the economic considerations that retirees typically face. This paper considers the puzzle of why retirement rates are so high at age 65, and explores a variety of explanations.

The Mirage of Fixed Exchange Rates

Maurice Obstfeld and Kenneth Rogoff

NBER Working Paper No. 5191
July 1995
JEL Nos. F31, E42, E52
International Finance and Macroeconomics, Monetary Economics

This paper discusses the profound difficulties of maintaining fixed exchange rates in a world of expanding global capital markets. Contrary to popular wisdom, monetary authorities in industrialized countries easily have the resources to defend exchange parities against virtually any private speculative attack. But if their commitment to use those resources lacks credibility with markets, then the costs to the broader economy of defending an exchange rate peg can be very high. We illustrate the dynamic interplay between credibility and commitment by describing the 1992 Swedish and British crises and the 1994–5 Mexican collapse. We also discuss the small number of successful "fixers."

Using Social Security Data on Military Applicants to Estimate the Effect of Voluntary Military Service on Earnings

Joshua D. Angrist

NBER Working Paper No. 5192
July 1995
JEL No. J31
Labor Studies

This study uses Social Security data on the earnings of applicants to the all-volunteer military forces to compare the earnings of veterans of the armed forces with the earnings of military applicants who did not enlist. I present matching, regression, and instrumental variables (IV) estimates. The matching and regression estimates control for most of the characteristics used by the military to select qualified applicants from the pool of military applicants. The IV estimates exploit an error in the scoring of exams that were used by the military to screen applicants between 1976 and 1980. All of the estimates suggest that soldiers who served in the early 1980s were paid considerably more while they were in the military than comparable civilians. Military service also appears to have led to a modest (less than 10 percent) increase in the civilian earnings of nonwhite veterans, while actually reducing the civilian earnings of white veterans. Most of the positive effects of military service on civilian earnings appear to be attributable to improved employment prospects for veterans.

The Nature of Precautionary Wealth

Christopher D. Carroll and Andrew A. Samwick

NBER Working Paper No. 5193
July 1995
JEL Nos. D91, E21
Aging, Economic Fluctuations, Public Economics

This paper uses the Panel Study of Income Dynamics to provide some of the first direct evidence that wealth is systematically higher for consumers whose income is more uncertain. However, the apparent pattern of precautionary saving is not consistent with a standard parameterization of the lifecycle model, in which consumers are patient enough to begin saving for retirement early in life: wealth is estimated to be less sensitive to uncertainty in permanent income than that model implies. Instead, our results suggest that over most of their working lifetime, consumers behave in accordance with the "buffer-stock" models of saving described in Carroll (1992) or Deaton (1991), in which consumers hold wealth principally to insulate consumption against near-term fluctuations in income.

How Important Is Precautionary Saving?

Christopher D. Carroll and Andrew A. Samwick

NBER Working Paper No. 5194
July 1995
JEL Nos. D91, E21
Aging, Economic Fluctuations, Public Economics

We estimate what fraction of the wealth of a sample of Panel Study of Income Dynamics (PSID) respondents is held because some households face greater uncertainty of income than others. First we derive an equation characterizing the theoretical relationship between wealth and uncertainty in a buffer-stock model of saving. Then we estimate that equation using PSID data; we find strong evidence that households engage in precautionary saving. Finally, we simulate the wealth distribution that would prevail if all households had the same uncertainty as the group with the least uncertainty. We find that between 39 and 46 percent of wealth in our sample is attributable to differentials in uncertainty across groups.

Alcohol Policies and Highway Vehicle Fatalities

Christopher J. Ruhm

NBER Working Paper No. 5195
July 1995
JEL No. I18
Health Economics

This study investigates the impact of beer taxes and a variety of alcohol-control policies on motor vehicle fatality rates. I use fixed-effect models with data for the 48 contiguous states from 1982 through 1988. It is also necessary to control adequately for grassroots efforts to reduce drunk driving, the enactment of other laws that operate simultaneously to reduce highway fatalities, and the economic conditions existing at the time of the legislation. In the specifications that I prefer, most of the regulations have little or no impact on traffic mortality. By contrast, higher beer taxes are associated with reductions in crash deaths; this result is relatively robust across specifications. These findings suggest that further regulatory action has a limited ability to reduce drunk driving, but higher alcohol taxes can play a potentially significant role.

Choosing a Dictator: Bureaucracy and Welfare in Less-Developed Polities

James E. Rauch

NBER Working Paper No. 5196
July 1995
JEL No. D73
International Trade and Investment

Recent work in the sociology of economic development has emphasized that establishing a professional government bureaucracy in place of political appointees is important to an institutional environment in which private enterprise can flourish. This paper focuses on the role of internal promotion in bringing to power individuals who value imposing their preferences toward collective goods on the public more than income. Such individuals restrain the corruption of their subordinates by using tax revenue to implement their preferences. Within this hierarchical framework, I investigate the effects of varying the compensation levels of subordinates and of recruiting them according to merit.

Real Effects of Exchange Rate-Based Stabilization: An Analysis of Competing Theories

Sergio T. Rebelo and Carlos A. Végh

NBER Working Paper No. 5197
July 1995
JEL No. F41
Growth, International Finance and Macroeconomics

We use a unified analytical framework to assess, both qualitatively and quantitatively, the relevance of the different hypotheses that have been proposed to explain the real effects of exchange rate-based stabilizations. The four major hypotheses we analyze are: 1) the supply-side effects associated with a decline in inflation; 2) the perception that the exchange rate peg is temporary; 3) the fiscal adjustments that tend to accompany the peg; and 4) the existence of nominal rigidities in wages or prices.

On the Ills of Adjustment

Ricardo J. Caballero and Mohamad L. Hammour

NBER Working Paper No. 5198
July 1995
JEL Nos. E10, F00, J60
Economic Fluctuations

We analyze market impediments to the process of structural adjustment, focusing on incomplete-contract inefficiencies in transactions between workers and firms that render the quasi-rents from "specific" investment appropriable. During adjustment, there is a depressed rate of creation of the new productive structure and excessive destruction of the old structure, leading to an employment crisis. Moreover, appropriability weakens the incentives for extensive restructuring, and results in a "sclerotic" productive structure. An adequate managed-adjustment program combines vigorous creation incentives in the expanding sector with measures to support employment in the contracting one. In contrast, the common prescription of gradualism does not act as an effective "synchronizer" of creation and destruction, because it can reduce destruction only by also reducing an already depressed creation rate.

Collaboration Structure and Information Dilemmas in Biotechnology: Organizational Boundaries as Trust Production

Lynne G. Zucker, Michael R. Darby, Marilynn B. Brewer, and Yusheng Peng

NBER Working Paper No. 5199
July 1995
JEL No. O31
Productivity

Scientists who make breakthrough discoveries can receive above-normal returns to their intellectual capital, depending upon the degree of natural excludability—that is, whether necessary techniques can be learned through written reports, or instead require hands-on experience with the discovering scientists or those trained by them in their laboratory. Privatizing discoveries, then, only requires selecting trusted others as collaborators, most often scientists working in the same organization. Within organizational boundaries, incentives become aligned based on repeat and future exchange, coupled with third-party monitoring and enforcement.

We find that high-value intellectual capital paradoxically predicts both a larger number of collaborators and more of that network contained within the same organization. Specifically, same-organization collaboration pairs are more likely when the value of the intellectual capital is high: both are highly productive "star" scientists, both are located in top-quality bioscience university departments, or both are located in a firm (higher ability to capture returns). In contrast, collaboration across organization boundaries is related negatively to the value of intellectual capital and positively to the number of times the star scientist has moved. Organizational boundaries act as "information envelopes." The more valuable the information produced, the more limited is its dissemination. In geographic areas where a higher proportion of coauthor pairs come from the same organization, diffusion to new collaborators is retarded.

An Empirical Analysis of Alcohol Addiction: Results from the Monitoring-the-Future Panels

Michael Grossman, Frank J. Chaloupka, and Ismail Sirtalan

NBER Working Paper No. 5200
July 1995
JEL No. I10
Health Economics

This paper aims to refine and enrich the empirical literature on the sensitivity of alcohol consumption and excessive consumption to differences in the prices of alcoholic beverages. Mainly, we incorporate insights provided by a model of rational addictive behavior that emphasizes the interdependency of past, current, and future consumption of an addictive good. This study uses a U.S. panel with members ranging in age from 17 through 27. Since the prevalence of alcohol dependence and abuse is highest in this age range, addictive models of alcohol consumption may be more relevant to this sample than to a representative sample of the population of all ages.

We find that alcohol consumption by young adults is addictive, in the sense that increases in past or future consumption cause current consumption to rise. The positive and significant future effect on consumption is consistent with the hypothesis of rational addiction, and inconsistent with the hypothesis of myopic addiction. The long-run elasticity of consumption with respect to the price of beer is approximately 60 percent larger than the short-run price elasticity, and twice as large as the elasticity that ignores addiction.

The Incidence of a Firm-Varying Payroll Tax: The Case of Unemployment Insurance

Patricia M. Anderson and Bruce D. Meyer

NBER Working Paper No. 5201
August 1995
JEL Nos. H22, J65
Labor Studies, Public Economics

In this paper, we examine the common case of a firm-varying tax used to finance a fringe benefit. While our data come from the experience-rated unemployment insurance system, the differential treatment of firms (including special considerations for small business) under mandated benefits laws leads to firm-varying costs analogous to those occurring with experience-rated taxes. Our theoretical model highlights the importance of this variation in taxes or costs, both within and across markets.

We examine annual changes in both average earnings and employment within firms and earnings of individual workers at the same firm. This method removes unmeasured firm and worker characteristics, thus avoiding the omitted variable bias that has plagued past work on incidence and compensating differentials. Our results suggest that most of the market-level tax is borne by the worker. However, this does not imply that there are no effects of the tax on employment. Rather, we find that individual firms can pass along only a small share of the within-market differences in the tax they face, leading to substantial employment reallocation across firms.

The Decline of Noncompeting Groups: Changes in the Premium to Education, 1890 to 1940

Claudia Goldin and Lawrence F. Katz

NBER Working Paper No. 5202
August 1995
JEL Nos. J0, N0
Development of the American Economy, Labor Studies

Between 1890 and the late 1920s the premium to high school education declined substantially for both men and women. In 1890 ordinary office workers, whose positions generally required a high school diploma, earned almost twice what production workers did. But by the late 1920s, office workers earned about one and a half times as much as production workers. The premium earned by female office workers, male office workers, and "male office workers plus supervisors" fell by about 30 percent.

Several factors operated in tandem to narrow differentials to education: the supply of high school graduates relative to those without high school degrees increased by 16 percent from 1890 to 1910, but by 40 percent from 1910 to 1920, and by 50 percent from 1920 to 1930. Immigration restriction was another factor, but was dwarfed by the expansion of high schools; reduced immigrant flows explain just one-eighth of the relative increase in the supply of educated workers. The impact of rapidly increasing supplies of high school educated workers was reinforced by technological changes in the office that enabled the substitution of educated workers and machines for the exceptionally able.

The premium to high school graduation, rather than declining further in the 1930s, leveled off as the demand for high school educated workers expanded in the manufacturing sector. We compare this historical period of narrowing wage differentials in the face of technological progress in the office to our current period of widening differentials.

What Can Explain the Apparent Lack of International Consumption Risksharing?

Karen K. Lewis

NBER Working Paper No. 5203
August 1995
International Finance and Macroeconomics, Asset Pricing

Recent research in international business cycles based on complete markets has found that correlations in international consumption are lower than the standard risksharing implications of these models would predict. In this paper, I use regression tests to determine which of two different types of explanations are valid. First, I consider whether nonseparabilities between tradables and nontradable leisure or goods can explain the puzzle. Surprisingly, nonseparabilities explain only a tiny fraction of the variation in the consumption of tradables across countries. Furthermore, I reject the hypothesis of risksharing in tradables.

Second, I examine the effects of capital market restrictions on aggregate consumption risksharing by countries. Risksharing definitely does not occur for countries facing more severe capital market restrictions, nor does it occur among the unrestricted group of countries. Therefore, risksharing does not appear to be resolved by either type of explanation alone. However, when I allow for both nonseparabilities and certain market restrictions, then risksharing among unrestricted countries appears to exist. This suggests that a combination of these two effects may be necessary to explain consumption risksharing across countries.

Price Level Determinacy Without Control of a Monetary Aggregate

Michael Woodford

NBER Working Paper No. 5204
August 1995
Economic Fluctuations, Monetary Economics

I show that the price level remains determinate even in the case of two kinds of radical money supply endogeneity—an interest rate peg by the central bank, and a "free banking" regime—commonly supposed to imply loss of control of the price level. Determination of the price level under such regimes can be understood in terms of a "fiscal theory of the price level," according to which the equilibrium price level makes the real value of nominally denominated government liabilities equal to the present value of expected future government budget surpluses. I also outline the application of the fiscal theory of the price level to exogenous money regimes.

A Positive Model of Growth and Pollution Controls

Larry E. Jones and Rodolfo E. Manuelli

NBER Working Paper No. 5205
August 1995
JEL Nos. E6, H1, O1
Growth

The most recent addition to the "economics of gloom" concerns the interplay between income and environmental degradation. The main question is whether continued environmental degradation is a necessary part of the process of industrialization. Will pollution continue to increase without bound as more and more countries pass through the development phase, or will it be controlled? Intuitively, if "clean air" is a normal good, we would expect that societies might be "self-regulating" in the sense that as income increases, pollution controls also increase. However, this intuition is somewhat misleading, because the presence of external effects is an essential feature of environmental regulation.

This paper describes a growth model in which pollutants are internal to a jurisdiction. We develop a model of the joint determination of the rate of development of the economy through market interactions and the extent of pollution regulation through collective decisionmaking. We show that depending on the collective decisionmaking mechanism in place, the time path of pollution can display an inverted U shape, a "sideways mirrored" S, or an increasing (but bounded) level over time.

This paper contributes to the literature on both the large differences in income per capita across countries and the discrepancies in their growth rates. It shows that by relying on collective decisionmaking mechanisms to choose policies, the dynamics of convex models can resemble those usually ascribed to models of multiple equilibriums.

Property and Casualty Solvency Funds as a Tax and Social Insurance System

James Bohn and Brian J. Hall

NBER Working Paper No. 5206
August 1995
JEL No. G22
Public Economics

When a Property and Casualty (P and C) insurance company becomes insolvent, solvent insurance companies are forced to pay assessments (a form of taxation) to state guarantee funds (called "solvency funds") in order to protect the policyholders of the failed company. We estimate the costs to the guarantee funds of resolving insolvencies of P and C insurance companies. We find that the total net costs (that is, payments by the fund less recoveries by the fund) of resolving insolvencies are remarkably high. We estimate that the mean ratio of net-costs-to-assets is approximately one; this implies that insolvent companies have roughly twice as many liabilities as assets when they fail. Our cost estimate for resolving insurance company insolvencies is roughly three times the comparable estimate for banks. We also find that the ratio of net-costs-to-assets tends to be higher for small firms, poorly capitalized firms, firms writing significant premiums in long tail lines, and firms that fail because of disasters. The resolution of insolvencies is typically quick: more than 60 percent of all costs to the fund for a given insolvency occur within two years, and more than three-quarters of total costs occur within three years. However, firms with a high proportion of premiums in long tail lines take much longer to resolve insolvencies.

Engines of Growth: Domestic and Foreign Sources of Innovation

Jonathan Eaton and Samuel Kortum

NBER Working Paper No. 5207
August 1995
Growth, International Trade and Investment, International Finance and Macroeconomics, Productivity

We examine productivity growth since World War II in the five leading research economies: West Germany, France, the United Kingdom, Japan, and the United States.

Data on the capital–output ratio suggest that these countries grew as they did because they were able to adopt more productive technologies, not because of capital deepening per se. We present a multicountry model of technological innovation and diffusion that implies that, for a wide range of parameter values, countries converge to a common growth rate, with relative productivities depending on the speed with which countries adopt technologies developed at home and abroad. Using parameter values that fit a cross section of data on productivity, research, and patenting, we simulate the growth of the five countries, given initial productivity levels in 1950 and research efforts in the four subsequent decades. Based on plausible assumptions about "technology gaps" that existed among these countries in 1950, we can explain their growth experiences quite successfully. Specifically, the simulations capture the magnitude of the slowdown in German, French, and Japanese productivity growth, and the relative constancy of U.K. and U.S. growth.

Who Works When? Evidence from the United States and Germany

Daniel S. Hamermesh

NBER Working Paper No. 5208
August 1995
JEL No. J22
Labor Studies

This study uses data for the United States from the May 1991 Current Population Survey and for Germany from the 1990 wave of the Socioeconomic Panel to analyze when people work during the day and week. The evidence shows: 1) Work in the evenings or at night is quite common in both countries, with around 7 percent of workers on the job even at 3 a.m. 2) Such work is performed mostly by people who are not shift workers. 3) Work at these times is inferior, in that it is performed disproportionately by people with little human capital. 4) Minority workers in the United States and the foreign-born in Germany are especially likely to work at these undesirable times. 5) Evening and night work is least likely in large metropolitan areas. 6) Spouses tend to work at the same time of the day. 7) However, young children break down the joint timing of spouses' work, with the burden of evening and night work falling disproportionately on working mothers. These findings demonstrate the gains to basing the analysis of work and leisure on data describing *instantaneous* time use.

Inflation Crises and Long-Run Growth

Michael Bruno and William Easterly

NBER Working Paper No. 5209
August 1995
JEL Nos. O11, O40, E63, E31
International Finance and Macroeconomics

Recent literature suggests that long-run averages of growth and inflation are only weakly correlated, and such correlation is not robust to exclusion of extreme inflation observations. Inclusion of time-series panel data has improved matters, but an aggregate parametric approach remains inconclusive. We propose a nonparametric definition of high inflation crises as periods when inflation is above 40 percent annually. Excluding countries with high inflation crises, we find no evidence of any consistent relationship between growth and inflation at any frequency. However, we find that growth falls sharply during discrete high inflation crises, then recovers surprisingly strongly after inflation falls. The decline in growth during crisis, and recovery of growth after crisis, tend to average out to close to zero (even slightly above zero); hence there is no robust cross-section correlation. Our findings could be consistent either with trend stationarity of output, in which inflation crises are purely cyclical phenomena, or with models in which crises have a favorable long-run purgative effect. Our findings do not support the view that reduction of high inflation carries heavy short-to-medium-run output costs.

The Political Economy of Branching Restrictions and Deposit Insurance: A Model of Monopolistic Competition Among Small and Large Banks

Nicholas Economides, R. Glenn Hubbard, and Darius Palia

NBER Working Paper No. 5210
August 1995
JEL Nos. G2, L5
Corporate Finance, Monetary Economics

This paper suggests that the introduction of bank branching restrictions and federal deposit insurance in the United States likely was motivated by political considerations. Specifically, we argue that these restrictions were instituted for the benefit of the small, unit banks that were unable to compete effectively with large, multi-unit banks. We analyze this "political hypothesis" in two steps. First, we use a model of monopolistic competition between small and large banks to examine gains to the former group from the introduction of branching restrictions and government-sponsored deposit insurance. We then

find strong evidence for the political hypothesis by examining the voting record of Congress.

Growth Without Scale Effects

Alwyn Young

NBER Working Paper No. 5211
August 1995
Growth

An increase in the size (scale) of an economy increases the total quantity of rents that can be captured by successful innovators. In equilibrium, this should lead to a rise in innovative activity. Conventional wisdom and the theoretical predictions of models of endogenous innovation suggest that this increased research effort should lead to more rapid growth. As noted by Jones (1993), this prediction is at odds with the postwar experience of the Organization for Economic Cooperation and Development, where the growth of the market indeed has led to an increased R and D effort that, however, has been translated into stagnant or declining growth rates. Drawing upon the remarkable insights of the museum curator S. C. Gilfillan (1935), this paper modifies models of endogenous innovation to allow for the possibility that a rise in the profitability of innovative activity could lead to an increased variety of differentiated solutions to similar problems. An increased variety of technologies (for example, an increase in the number and types of contraceptives) will increase the level of utility of the average consumer. However, if continued improvement of this increased variety of technologies requires increased research input, then a rise in the scale of the market could raise the equilibrium quantity of R and D, without increasing the economy's growth rate. Furthermore, increased product variety, brought about by increases in market size, might reduce the returns to improving product quality, paradoxically lowering an economy's growth rate while increasing the total resources devoted to R and D.

Does Monetary Policy Affect Real Economic Activity? Why Do We Still Ask This Question?

Benjamin M. Friedman

NBER Working Paper No. 5212
August 1995
JEL No. E50
Monetary Economics

The predominant weight of the existing evidence suggests that the effects of monetary policy on real economic activity are systematic, significant, and sizable. Yet questions remain, both about individual empirical results and, more broadly, about the different methodological approaches that researchers have used to investigate these effects. This paper addresses the conceptual issues that account for our continuing to ask whether monetary policy has real effects even though, at a certain level, we do "know" the answer. The paper's overview of theory and evidence suggests that much of the explanation for the continuing tug-of war between research findings and subsequent questions in this area lies in two sets of limitations, one reflecting how economics conceptualizes behavioral processes and one reflecting how economics draws inferences from observed data.

Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Survey

Robert B. Barsky,
Miles S. Kimball,
F. Thomas Juster, and
Matthew D. Shapiro

NBER Working Paper No. 5213
August 1995
JEL Nos. D81, D91, O42
Asset Pricing, Economic Fluctuations, Monetary Economics

Individuals' preferences underlying most economic behavior are likely to display substantial heterogeneity. This paper reports on direct measures of preference parameters relating to risk tolerance, time preference, and intertemporal substitution. These experimental measures are based on survey respondents' choices in hypothetical situations. The questions are constructed with as little departure from the theorist's concept of the underlying parameter as possible.

The individual measures of preference parameters display substantial heterogeneity. The majority of respondents fall into the least risk-tolerant group, but a substantial minority display higher risk tolerance. The individual measures of intertemporal substitution and time preference also display substantial heterogeneity. The mean risk tolerance is 0.25; the mean elasticity of intertemporal substitution is 0.2. Estimated risk tolerance and the elasticity of intertemporal substitution are essentially uncorrelated across individuals.

Because the risk tolerance measure is obtained as part of the main questionnaire of a large survey, it can be related to a number of economic behaviors. Measured risk tolerance is related positively to a number of risky behaviors, including smoking, drinking, failing to have insurance, and holding stocks rather than Treasury bills. Although measured risk tolerance explains only a small fraction of the variation of the studied behaviors, these estimates provide evidence about the validity and usefulness of the measures of preference parameters.

Fiscal Expansions and Fiscal Adjustments in OECD Countries

Alberto Alesina and Roberto Perotti

NBER Working Paper No. 5214
August 1995
Monetary Economics

This paper considers budget expansions and adjustments in Organization for Economic Cooperation and Development countries in the last three decades. Our main results are: 1) on average, fiscal expansions are the result of increases in expenditures, particularly of transfer programs, while contractions typically are caused by tax increases; 2) however successful (that is, long lasting), a minority of the total rely primarily on reduction of government wages and employment and cuts in transfer programs; 3) even major successful fiscal adjustments do not seem to have recessionary consequences, on average; and 4) different types of governments show different degrees of success at implementing successful fiscal adjustment, with coalition governments showing the worst performance.

Do National Borders Matter for Quebec's Trade?

John F. Helliwell

NBER Working Paper No. 5215
August 1995
JEL Nos. F14, F15
International Finance and Macroeconomics, International Trade and Investment

Extending McCallum's (1995) result, based on a gravity model of 1988 trade flows, that a typical Canadian province trades 22 times more with other provinces than with U.S. states of similar size and distance, this paper asks how Quebec trade patterns compare with those of other provinces. The results, based on revised data for 1988, 1989, and 1990, show that while the typical province trades more than 20 times as much with other provinces as with comparable U.S. states, the multiple is even greater for Quebec. Thus trade between Quebec and the United States appears to be an even less viable alternative to interprovincial trade for Quebec than it is for the rest of Canada. The implications of these results for international economics are considerable, as they show that trade linkages within a national economy are far greater than previously imagined. If those results are confirmed, they imply that the fabric of national economies is far tighter than that of the global trading system, even for countries operating without substantial trade barriers.

Disease Complementarities and the Evaluation of Public Health Interventions

William H. Dow, Jessica Holmes, Tomas Philipson, and Xavier Sala-i-Martin

NBER Working Paper No. 5216
August 1995
JEL Nos. I0, I1
Growth, Health Economics

This paper provides a theoretical and empirical investigation of the positive complementarities between disease-specific policies introduced by competing risks of mortality. The incentive to invest in prevention against one cause of death depends positively on the level of survival from other causes. This means that a specific public health intervention has benefits other than the direct medical reduction in mortality: it affects the incentives to fight other diseases, so the overall reduction in mortality in general will be larger than that predicted by the direct medical effects. We discuss evidence of these cross-disease effects by using data on neonatal tetanus vaccination through the Expanded Programme on Immunization of the World Health Organization.

An Adverse-Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy

Jeremy C. Stein

NBER Working Paper No. 5217
August 1995
Corporate Finance, Monetary Economics, Economic Fluctuations

This paper develops a model of bank-asset-and-liability management, based on the idea that information problems make it difficult for banks to raise funds other than with insured deposits. The model can be used to address the question of how monetary policy works. One effect it captures is that when the Fed reduces reserves, this tightens banks' financing constraints, thereby leading to a cutback in bank lending; this is the "bank lending channel" in action. However, in addition to providing a specific set of microfoundations for the lending channel, the model also yields a novel account of how monetary policy affects interest rates in the bond market.

High-Income Families and the Tax Changes of the 1980s: The Anatomy of Behavioral Response

Joel B. Slemrod

NBER Working Paper No. 5218
August 1995
JEL No. H2
Public Economics

The relative income gains of the affluent after the passage of the Tax Reform Act of 1986 (TRA86), which sharply lowered tax rates at high income levels, are overstated by comparing cross-sectional slices using concurrent income definitions. Nevertheless, they are large. Although an index of the demand-side factors affecting inequality throughout the income distribution can explain much of the increased high-income concentration until 1985, it cannot adequately explain the post-TRA86 spurt. Thus, TRA86 is likely to have been a principal cause of the large increase in the reported personal income of the affluent. A close look at the sources of the post-1986 increases in the reported individual income of high-income households suggests that much is caused by shifting of income—for example, from the corporate tax base to the individual tax base—and not income creation, such as additional labor supply. This distinction is critical, because knowing how much the reported individual income of a particular group of people changes in response to a tax change is not sufficient for evaluating adequately its revenue consequences, incidence, and efficiency.

After the Deluge: Do Fixed Exchange Rates Allow Intertemporal Volatility Trade-Offs?

Andrew K. Rose

NBER Working Paper No. 5219
August 1995
JEL Nos. F31, F33
International Finance and Macroeconomics

This paper addresses the issue of whether regimes of fixed exchange rates are a mechanism for shifting volatility intertemporally. Using a panel of data covering 20 industrialized countries from 1959 through 1993, I examine the volatilities of a host of real and monetary variables. Graphical and statistical examination of the periods around 33 flotations and 81 devaluations reveals little evidence of significant increases in volatility following these events.

The Seamless World: A Spatial Model of International Specialization

Paul R. Krugman and Anthony J. Venables

NBER Working Paper No. 5220
August 1995
JEL Nos. F1, F12, F15
International Trade and Investment, International Finance and Macroeconomics

This paper is an effort to do international trade theory without mentioning countries. Nearly all models of the international economy assume that trade takes place between nations or regions that are themselves dimensionless points. We develop a model in which economic space instead is assumed to be continuous, and in which this "seamless world" spontaneously organizes itself into industrial and agricultural zones because of the tension between forces of agglomeration and disagglomeration. One might expect such a model to be analytically intractable, but we are able to gain considerable insight through a combination of simulations and an analytical approach originally suggested in a biological context by Alan Turing.

Openness and Growth: A Time-Series, Cross-Country Analysis for Developing Countries

Ann Harrison

NBER Working Paper No. 5221
August 1995
JEL Nos. F43, O47
International Trade and Investment

This paper draws together a variety of measures of openness to test its association with growth. Although the correlation across different types of openness is not always strong, there is generally a positive association between growth and different measures of openness. The strength of the association depends on whether the specification uses cross-sectional or panel data (which combines cross section and time series). For industrializing countries, which have exhibited significant fluctuations in trade regimes over time, long-run averages may not serve as very meaningful indicators of policy.

The Language Ability of U.S. Immigrants: Assimilation and Cohort Effects

Geoffrey Carliner

NBER Working Paper No. 5222
August 1995
JEL Nos. J15, J24, F22
Labor Studies

This paper uses data from the 1980 and 1990 U.S. Census of Population to examine the English language skills of natives and immigrants. The first main finding is that lack of fluency in spoken English is rare among native-born Americans. In 1990, 98.4 percent of natives aged 18 to 64 reported speaking only English or speaking it very well. Among native-born children of ethnic groups who have come to the United States in large numbers during the past 30 years, such as Hispanics and East Asians, a substantial fraction were not fluent when they entered grade school, but at most 3 to 5 percent of teenagers and adults in these groups reported speaking English poorly or not at all.

Second, the vast majority of immigrants speak English well. In 1990, only a quarter of immigrants reported speaking English poorly or not at all, although more than half of Mexicans and one-third of immigrants from other non-English-speaking western hemisphere coun-tries could not speak English well. Although English skills improve with length of residence, after 30 or more years in the United States over a quarter of Mexican immigrants spoke English poorly or not at all.

Third, since the 1950s there has been a trend decrease in the probability of fluency (speaking only English or speaking it very well) among new immigrants of about 0.1 percentage points per year, caused by the shift from European immigrants with strong English skills to Latin American and East Asian immigrants who arrive speaking less English. On average, each additional year of residence in the United States increases the probability of fluency by 1.1 percentage points. An additional year of schooling increases the probability of fluency by about 5 percentage points. Overall, women are slightly more likely to be fluent than men, especially East Asian and European women. Even after controlling for differences in education, years since arrival, and other factors, large differences in English skills by region of origin remain. These differences seem to be associated more with geographic distance from the United States than with the source country's per capita income or linguistic distance from English.

Factors Affecting Labor Supply Decisions and Retirement Income

Robin L. Lumsdaine

NBER Working Paper No. 5223
August 1995
JEL Nos. J14, J26
Aging

Recent policy has focused on alleviating poverty among the elderly, and has met with varying degrees of success. Some subsets of the elderly population have gained at the expense of others. One component of the policy debate has been identifying which factors might influence decisions about labor force participation, and what effects these decisions will have on retirement income and its adequacy for a growing elderly population. While models of retirement behavior are becoming increasingly sophisticated, most fail to capture key elements, such as expectations and uncertainty. In part this is caused by the reduced-form nature of policy experiments: parameters are estimated under a current policy, and used to predict effects of an alternative scenario. This approach implicitly assumes that the only difference in the alternative setting is the change in policy, and does not account adequately for endogeneity of decisions and responses to these changes. This paper reviews factors affecting the labor supply decision, their interactions with and implications for subsequent retirement income, and identifies important methods and data requirements necessary to model complicated dynamic behavior more accurately.

The Effect of New Jersey's Minimum Wage Increase on Fast-Food Employment: A Reevaluation Using Payroll Records

David Neumark and William Wascher

NBER Working Paper No. 5224
August 1995
JEL Nos. J23, J38
Labor Studies

We reevaluate the evidence from Card and Krueger's (CK's) 1994 New Jersey–Pennsylvania minimum wage experiment, using new data based on actual payroll records from 230 Burger King, KFC, Wendy's, and Roy Rogers restaurants in New Jersey and Pennsylvania. We compare results using these payroll data to those using CK's data, which were collected by telephone surveys. We have two findings to report:

First, the data collected by CK appear to indicate greater variation in employment over the eight-month period between their surveys than the payroll data do. For example, in the full sample, the standard deviation of employment change is three times as large in CK's data as in the payroll data.

Second, estimates of the employment effect of the New Jersey increase in the minimum wage based on the payroll data lead to the opposite conclusion from what CK reached. For comparable sets of restaurants, differences-in-differences estimates using CK's data imply that the New Jersey minimum wage increase (of 18.8 percent) resulted in an employment *increase* of 17.6 percent relative to the Pennsylvania control group, an elasticity of 0.93. In contrast, estimates based on the payroll data suggest that the New Jersey minimum wage increase led to a 4.6 percent *decrease* in employment in New Jersey relative to the Pennsylvania control group. This decrease is statistically significant at the 5 percent level and implies an elasticity of employment with respect to the minimum wage of –0.24.

The Effects of Trade Policy Reform: What Do We Really Know?

Ann Harrison and Ana Revenga

NBER Working Paper No. 5225
August 1995
International Trade and Investment

The magnitude of existing research on the effects of trade reform is impressive. Yet economists have not reached a clear consensus on a number of important questions, including the labor market impact of trade reform, the linkages between trade and foreign direct investment, and the relationship between trade and growth. In this paper we attempt to clarify what we know about the relationship among trade reform, factor markets, and growth.

Although many studies have shown a positive relationship between various measures of openness and growth, many nagging problems remain. Trade policy is almost never measured using the most obvious indicators, for example tariffs. Further, many studies are plagued by serious econometric problems. The evidence on labor markets and trade reform is less extensive. Based on the studies to date, it appears that the unemployment and wage effects of trade reforms generally have been small. In this paper, we discuss the possibility that small wage and employment responses are caused by labor market regulations. We conclude with an analysis of the linkages between trade policies and foreign investment flows. Our evidence suggests that trade reform has been accompanied by significant increases in investment inflows.

Measuring the Intensity of Competition in Export Markets

Pinelopi K. Goldberg and Michael M. Knetter

NBER Working Paper No. 5226
August 1995
International Trade and Investment

This paper develops an approach to measuring the intensity of competition in international markets. The method measures the degree of "outside" competition faced by exporters located in one source country from firms located outside the source country. We use the elasticity of price and quantity to exchange rate shocks, which shift the relative costs of producers from a particular source country, to calculate our measure of outside competition. We estimate the measures using panel data on exports of U.S. linerboard and German beer to a variety of destination markets. The destination-specific panel data allow comparisons of outside competition across destination markets.

Options, the Value of Capital, and Investment

Andrew B. Abel, Avinash K. Dixit, Janice C. Eberly, and Robert S. Pindyck

NBER Working Paper No. 5227
August 1995
Asset Pricing, Economic Fluctuations, Industrial Organization, Productivity

Capital investment decisions must recognize the limitations on the firm's ability to sell off or expand capacity later. This paper shows how opportunities for future expansion or contraction can be valued as options, how this valuation relates to the *q*-theory of investment, and how these options affect the incentive to invest. Generally, the option to expand reduces the incentive to invest, while the option to disinvest raises it. We show how these options interact to determine the effect of uncertainty on investment, how these option values change in response to shifts of the distribution of future profitability, and how the *q*-theory and option pricing approaches to investment are related.

Nonemployment and Health Insurance Coverage

Jonathan Gruber and Brigitte C. Madrian

NBER Working Paper No. 5228
August 1995
JEL Nos. H51, J64
Health Care. Labor Studies, Public Economics

Low rates of health insurance coverage among those who are without a job have motivated consideration of policies to subsidize their purchase of insurance. But there is little evidence on the extent to which differentials in coverage between the employed and the nonemployed reflect the effects of job loss versus merely different underlying tastes for insurance. If it is the latter, then subsidies may not be successful in increasing the rate of insurance coverage among the nonemployed. Furthermore, subsidies that lower the costs of nonemployment may increase both the incidence and the duration of joblessness.

We provide new evidence on these issues by analyzing longitudinal data on 25–54-year-old men for 1983–9. We have four interesting findings: First, even after modeling differences in underlying tastes for insurance, we find that the likelihood of insurance coverage drops by roughly 20 percentage points following separation from a job. Second, limited subsidization of the cost of insurance through state laws mandating continued access to employer-provided health insurance for the nonemployed increases by 6.7 percent the likelihood of having insurance but no job. Third, these mandates also increase the number of individuals with spells of nonemployment and the total amount of time spent jobless. Finally, at least some of this increased nonemployment appears to be spent in productive job search, as the availability of continuation coverage is related to significant wage gains among those who separate from their jobs.

External Financing and Insurance Cycles

Anne Gron and Deborah J. Lucas

NBER Working Paper No. 5229
August 1995
Corporate Finance

We explore the conjecture that the periodic episodes of high prices and constrained supply in the property–casualty insurance industry are the result of temporary shortages of capital. To do this we look for increases in activities aimed at increasing capital at these times: dividend cuts, repurchase cuts, equity issues, and debt issues. By examining the market price response to security issues, we also look for evidence that the costs of raising external capital are unusually high relative to other industries.

We find some evidence of changes in payout policy in the expected direction, and also of an increased volume of debt and equity issues after periods of low capacity. However, the total amount of capital obtained by security issues or reduced payouts appears to be small relative to the observed drops in net worth. This suggests that insurers rely primaily on future retained earnings to rebuild their capital position. When property–casualty insurers do go to the capital markets, we find that they do not receive an unusually poor reception. In fact, the market price reaction to equity issues appears to be considerably less negative than for industrial issuers, but similar to that for banks and utilities.

A Reanalysis of *The Bell Curve*

Sanders Korenman and Christopher Winship

NBER Working Paper No. 5230
August 1995
JEL Nos. J3, J2, I3, J7
Labor Studies

In *The Bell Curve,* Herrnstein and Murray argue that a youth's intelligence (IQ) is a more important determinant of social and economic success in adulthood than is the socioeconomic status (SES) of his or her parents. They base this conclusion on comparisons of the effects of IQ score (measured at ages 15 and 23) with the effects of an index of parents' SES taken from models of economic status, marriage, welfare use, involvement in crime, as well as several outcomes for young children. However, reviewers of *The Bell Curve* have questioned whether Herrnstein and Murray's estimates of the effects of IQ are overstated by their use of a rather crude measure of parents' SES.

Comparisons of siblings in the Herrnstein and Murray sample, a more comprehensive and accurate way to control for family background, reveal little evidence that these estimates of the effects of IQ score are biased because of omitted characteristics of family background (with the possible exception of outcomes for young children). However, there is evidence of substantial bias caused by measurement error in the estimates of the effects of parents' socioeconomic status. In addition, Herrnstein and Murray's measure of parental SES fails to capture the effects of important elements of family background (such as single-parent family structure for youth at age 14). As a result, their analysis gives an exaggerated impression of the importance of IQ relative to parents' SES, and relative to family background more generally. Estimates based on a variety of methods, including analyses of siblings, suggest that parental family background is at least as important as, and may be much more important than, IQ in determining social and economic success in adulthood.

Beyond the Incidence of Training: Evidence from a National Employers Survey

Lisa M. Lynch and Sandra E. Black

NBER Working Paper No. 5231
August 1995
JEL No. J24
Labor Studies

This paper seeks to provide new insights into how investments in school and post-school training are linked to employer workplace practices and outcomes. We use a unique nationally representative survey of U.S. establishments: the Educational Quality of the Workforce National Employers Survey. We go beyond simply measuring the incidence of formal or informal training to examine the determinants of the types of training employers invest in; the relationship between formal school and employer-provided training; who is receiving training; the links between investments in physical and human capital; and the impact that human capital investments have on the productivity of establishments. We find that the smallest employers are much less likely to provide formal training programs than employers from larger establishments. Regardless of size, those employers who have adapted some of the practices associated with what have been called "high-performance work systems" are more likely to have formal training programs. Especially in the manufacturing sector, employers who have made large investments in physical capital, or who have hired workers with higher average education, are also more likely to invest in formal training and to train a higher proportion of their workers. There are significant and positive effects on establishment productivity associated with investments in human capital. Those employers who hire better-educated workers have appreciably higher productivity. The impact of employer-provided training differs according to the nature, timing, and location of the employer investments.

Tax Reforms and Investment: A Cross-Country Comparison

Jason G. Cummins, Kevin A. Hassett, and R. Glenn Hubbard

NBER Working Paper No. 5232
August 1995
JEL Nos. H3, E2
Corporate Finance, Public Economics

We use firm-level panel data to explore the extent to which fixed investment responds to tax reforms in 14 OECD countries. Previous studies often have found that investment does not respond to changes in its marginal cost. We identify some of the factors responsible for this, and use an estimation procedure that sidesteps the most important of them. In so doing, we find evidence of statistically and economically significant investment responses to tax changes in 12 of the 14 countries.

Stock Market Efficiency and Economic Efficiency: Is There a Connection?

Gary Gorton and James Dow

NBER Working Paper No. 5233
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JEL Nos. G14, G30
Corporate Finance

In a capitalist economy prices serve to equilibrate supply and demand for goods and services, continually changing to reallocate resources to their most efficient uses. However, secondary stock market prices, often viewed as the most "informationally efficient" prices in the economy, have no direct role in the allocation of equity capital, since managers have discretion in determining the level of investment. What is the link between stock price informational efficiency and economic efficiency?

We present a model of the stock market in which: 1) managers have discretion in making investments and must be given the right incentives; and 2) stock market traders may have important information that managers do not have about the value of prospective investment opportunities. In equilibrium, information in stock prices will guide investment decisions because managers will be compensated based on informative stock prices in the future.

The stock market indirectly guides investment by transferring two kinds of information: information about investment opportunities and information about managers' past decisions. The fact that stock prices have only an indirect role suggests that the stock market may not be a necessary institution for the efficient allocation of equity. We emphasize this by providing an example of a banking system that performs as well.

Risk Taking by Mutual Funds as a Response to Incentives

Judith A. Chevalier and Glenn D. Ellison

NBER Working Paper No. 5234
August 1995
Corporate Finance,
Industrial Organization

This paper examines the agency conflict between mutual fund investors and mutual fund companies. Investors would like the fund company to use its judgment to maximize risk-adjusted fund returns. A fund company, however, in its desire to maximize its value as a concern has an incentive to take actions that increase the inflow of investment. We use a semiparametric model to estimate the shape of the flow-performance relationship for a sample of growth and growth and income funds observed from 1982–92. The shape of the flow-performance relationship creates incentives for fund managers to increase or decrease the riskiness of the fund, depending on the fund's year-to-date return. Using a new dataset of mutual fund portfolios that includes equity portfolio holdings for September and December of the same year, we show that mutual funds do alter their portfolio riskiness between September and December in a manner consistent with these risk incentives.

Voluntary Export Restraints on Automobiles: Evaluating a Strategic Trade Policy

Steven Berry, James A. Levinsohn, and Ariel Pakes

NBER Working Paper No. 5235
August 1995
Industrial Organization, International Trade and Investment, Productivity

In May 1981, a voluntary export restraint (VER) was placed on exports of automobiles from Japan to the United States. As trade policies go, this one was important. At about the same time, although with much less fanfare, international trade theorists were obtaining (then) startling results from models of international trade in imperfectly competitive markets. These models suggested that in imperfectly competitive markets, an activist trade policy might enhance national welfare. In this paper, we provide some empirical evidence on whether these new theoretical possibilities might actually apply to the VERs.

The Effects of Rising Female Labor Supply on Male Wages

Chinhui Juhn and Dae Il Kim

NBER Working Paper No. 5236
August 1995
JEL Nos. J31, J23
Labor Studies

This paper examines the extent to which rapid increases in female labor supply contributed to rising wage inequality and declining real wages for less-skilled males during the 1980s. We find that while the declines in the male wage are concentrated in the 1980s, growth in the female labor supply slowed in the 1980s relative to the 1970s. Women also increased their relative supply of skill in the economy in the 1980s. We find that this is inconsistent with a simple explanation in which supply shifts among women have played a major role. Instead, it supports the view that demand shifts, rather than supply shifts, have been the underlying cause of declining opportunities for less-skilled males and the rapid growth in inequality in the 1980s.

We also use state and SMSA-level data to estimate cross-substitution effects between men and women of different skill types. We find weak evidence that women may be substitutes for men who are high school dropouts, and that college-educated women may have contributed to the growth in wage inequality by being better substitutes for male high school dropouts than for male high school graduates. We conclude with some suggestive evidence that unmeasured shifts in demand that favored skilled female workers over less-skilled male workers may be biasing our results toward finding some substitution between these two groups.

Industrial Policy, Employer Size, and Economic Performance in Sweden

Steven J. Davis and Magnus Henrekson

NBER Working Paper No. 5237
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JEL Nos. L52, J21, H30
Labor Studies

The pre-1990 Swedish tax system strongly disfavored younger, smaller, and less capital-intensive firms and sectors, and discouraged entrepreneurship and family ownership of businesses in favor of institutional ownership. Credit market regulations, the national pension system, employment security laws, and centralized wage setting in Sweden reinforced the distortionary impact of the tax system. We describe the relevant Swedish policies and institutional arrangements, and explain why the attendant distortions are likely to have hampered the efficient allocation of resources, reduced productivity, and retarded economic growth and recovery.

We also develop evidence on the consequences of these distortions for the size structure and industrial distribution of employment. Taking the U.S. industrial distribution as a benchmark that reflects a comparatively neutral set of policies and institutions, we find that Sweden's employment distribution is tilted sharply away from lower-wage industries, less capital-intensive industries, and industries characterized by greater employment shares toward smaller firms and establishments. Compared to other OECD economies, Sweden has the lowest rate of self-employment, a dominant role for larger firms, and highly concentrated ownership and control of private-sector economic activity.

The Demand for Illicit Drugs

Henry Saffer and Frank J. Chaloupka

NBER Working Paper No. 5238
August 1995
Health Economics

This paper estimates the effects of heroin and cocaine prices and decriminalization of marijuana on the demand for those three drugs. There are few prior empirical studies in this area because data have been difficult to acquire. We use newly available data on drug prices from the Drug Enforcement Agency, and are the first to link these data to a sample of 49,802 individuals from the National Household Survey of Drug Abuse. The results show that drug use is more responsive to price than has been thought previously. The participation price elasticity for heroin is about –.9 to –.8, and the participation price elasticity for cocaine is about –.55 to –.36. Marijuana decriminalization increases the probability of using marijuana by about 4 to 6 percent. The price elasticity for heroin is about –1.8 to –1.6, and for cocaine about –1.1 to –.72. We estimate that legalization would lead to about a 100 percent increase in the quantity of heroin consumed, and about a 50 percent increase in the quantity of cocaine consumed.

Can Capital Controls Alter the Inflation–Unemployment Trade-Off?

Assaf Razin and Chi-Wa Yuen

NBER Working Paper No. 5239
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JEL No. F2
International Finance and Macroeconomics

It is well known that in the Mundell–Fleming model, capital mobility creates a channel through which permanent (transitory) shocks to aggregate demand—such as fiscal and trade shocks—are neutralized completely (partially) by the response of the real exchange rate. An important policy implication of the model that went largely unnoticed is how the transmission of these shocks under different degrees of capital mobility may alter the inflation–unemployment trade-off, that is, the Phillips Curve. In the context of the stochastic Mundell–Fleming model, we show that capital controls reduce the output/employment variations at the expense of bigger variations in inflation rates. When policymakers put more weight on stable employment than on stable inflation, therefore, their objective can be attained more easily under capital controls.

Race, Children's Cognitive Achievement, and *The Bell Curve*

Janet Currie and Duncan Thomas

NBER Working Paper No. 5240
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JEL Nos. I20, I30
Labor Studies

In *The Bell Curve,* Herrnstein and Murray demonstrate that a mother's score on the Armed Forces Qualification Test (AFQT) is a powerful predictor of her child's score on the Peabody Picture Vocabulary Test (PPVT). We replicate this finding for PPVT and two related tests. However, even after controlling for AFQT, there are significant racial gaps in PPVT scores, suggesting that AFQT is not all that matters. In fact, both maternal education and income are important determinants of children's test scores, and their influences differ dramatically with the test, the child's age, and the child's race. These racial gaps in test scores are important because, even within families, children with higher scores are less likely to repeat grades. Moreover, conditional on children's test scores *and* maternal AFQT, maternal education and income affect the probability of grade repetition. We move beyond AFQT and examine the effects of individual Armed Services Vocational Aptitude Battery subsets on children's scores. We find that the skills that are rewarded in the labor market are not always the same as those associated with improved child outcomes. An understanding of the relationship among different aspects of maternal achievement and child outcomes may help us to unravel the complex process through which poverty is transmitted across generations.

Capital Markets Integration, Volatility, and Persistence

Joshua Aizenman

NBER Working Paper No. 5241
August 1995
JEL Nos. F12, F21
International Trade and Investment

This paper shows that volatility induces adverse first-order welfare effects in countries excluded from the global capital market. We illustrate this result in a model characterized by gains from a greater division of activities, in which shocks are persistent. We show that nonlinearities attributed to financial autarky explain the adverse welfare effects of volatility. We identify the parameters determining the magnitude of the loss. It is proportional to: the autocorrelation of shocks; volatility (as measured by the standard deviation of shocks); and the degree of product differentiation (as measured by the substitutability among intermediate products).

Trade, Spatial Separation, and the Environment

Brian R. Copeland and M. Scott Taylor

NBER Working Paper No. 5242
August 1995
JEL Nos. F10, Q20, R10
International Trade and Investment

We develop a simple two-sector dynamic model to examine the effects of international trade in the presence of pollution-created cross-sectoral production externalities. We assume that the production of "smokestack" manufactures generates pollution, which lowers the productivity of an environmentally sensitive sector ("farming"). As a result, the long-run production set is nonconvex. Pollution provides a motive for trade, since trade can separate incompatible industries spatially. Two identical, unregulated countries will gain from trade if the share of world income spent on smokestack is *high*. In contrast, when the share of world income spent on the dirty good is *low*, trade can usher in a negatively reinforcing process of environmental degradation and real income loss for the exporter of smokestack.

Present at the Revolution: Transformation of Technical Identity for a Large Incumbent Pharmaceutical Firm After the Biotechnological Breakthrough

Lynne G. Zucker and Michael R. Darby

NBER Working Paper No. 5243
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JEL No. O31
Productivity

This paper presents a case study of the transformation in research methods that occurred in a large U.S. pharmaceutical firm as a result of the biotechnology revolution. This transformation is not consistent with the hypothesis that technological revolutions make existing firms obsolete (because of rigidity of core task routines). It is consistent with the wealth-maximization hypothesis, under which valuable assets (including delivery know-how and other complementary technologies) will not be wasted if technological change in one part of the organization is necessary for the remainder of the organization to maintain its competitiveness. While the transformation was achieved through a variety of methods, the primary route was hiring new personnel possessing the new technology, and incorporating them into the existing structure.

While the technological transformation has been profound, biotechnology applications in this large incumbent firm are more likely to be used in combination with other technologies than in the new biotechnology firms (NBFs), which tend to use biotechnology for both discovery and production of new therapeutic entities. This difference in emphasis may result in value-enhancing synergies because of the wealth of related knowledge that makes for more effective applications of the new technologies. However, it could also retard full adoption of biotechnology. Resolution of this empirical question is the subject of future research.

It appears that this firm was somewhat slower than the dedicated biotech firms to adopt the new technology. Once the decision was made to transform the technological identity of the firm, though, massive resources were provided to recruit the intellectual human capital required to make it happen. We conducted a preliminary analysis of data for this and other major pharmaceutical firms on the extent of publication by top "star" scientists either affiliated with the firm or writing with scientists from the firm —a powerful predictor of successful application of biotechnology. We also examined patenting of genetic sequences by these firms, as well as by corresponding NBFs. The incumbent firms were generally slow to adopt biotechnology, but as a group made great strides in the late 1980s in increasing their share of all commercial ties to the star scientists, as well as their share of patents.

Bank Capital Regulation in General Equilibrium

Gary Gorton and Andrew Winton

NBER Working Paper No. 5244
August 1995
JEL No. G21
Corporate Finance

Using a multiperiod general equilibrium model of banking, we study whether the socially optimal level of stability in the banking system can be implemented with regulatory capital requirements. We show that: 1) bank capital is costly because of the unique liquidity services provided by demand deposits, so a bank regulator optimally may choose to have a risky banking system; and 2) even if the regulator prefers more capital in the system, the regulator is constrained by the private cost of bank capital, which determines whether bank shareholders will agree to meet capital requirements rather than exit the industry.

The Causes and Consequences of Rate Regulation in the Auto Insurance Industry

Dwight M. Jaffee and Thomas Russell

NBER Working Paper No. 5245
September 1995
JEL Nos. G22, G28

This paper examines various explanations for the increase in the degree of regulation of the auto insurance industry over the last ten years. Using cross-sectional data for California, we confirm earlier findings for Massachusetts that the demand for auto insurance is highly elastic to price. This implies that regulation-induced price rollbacks (such as those mandated by California's popular initiative, Proposition 103) have significant effects on welfare.

We explain the increase in regulation in two ways: 1) as an attempt to lower rates to deal with the problem of the uninsured motorist; and 2) more fundamentally, as a response to the perceived lack of fairness of the sharp increase in premiums in the 1980s. This perception of lack of fairness arises because, although auto insurance costs rose sharply in the 1980s, most buyers of auto insurance have no claims in any ten-year period. Thus, most buyers have only last year's premium as a reference point with which to judge the fairness of this year's premium.

We test the hypothesis that the increase in regulation is driven by a perception of unfairness by analyzing the cross-county voting pattern on Proposition 103. Voting in favor of price regulation is correlated positively with the level of insurance premium. This result is consistent both with the view that voting behavior is based on self-interest and with the view that the increased demand for regulation is driven by concerns that the large disparity in premiums across counties is unfair.

Organizational Form and Insurance Company Performance: Stocks Versus Mutuals

Patricia Born, William M. Gentry, W. Kip Viscusi, and Richard J. Zeckhauser

NBER Working Paper No. 5246
September 1995
Corporate Finance, Industrial Organization

One unusual feature of the U.S. property–casualty insurance industry is the coexistence of stock and mutual companies. Agency theories suggest that the stock company may be more "opportunistic" and less obligated to its insureds than the mutual company. We assess the responses by stock and mutual firms to changes in their underwriting environment from 1984 to 1991; we use measures of individual firms' performance, by state and by insurance line, in eight different lines of insurance. We find that stock companies are more likely than mutuals to reduce their business in unprofitable situations, and they have higher losses than mutuals for a given amount of premiums.

Pricing Decisions in Franchised Chains: A Look at the Restaurant and Fast-Food Industry

Francine Lafontaine

NBER Working Paper No. 5247
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JEL Nos. L22, L42, L8
Industrial Organization

This paper examines empirical issues of pricing and price dispersion within franchised restaurant and fast-food chains. Given the per se illegality of resale price maintenance under current U.S. antitrust laws, and the fact that franchised outlets are independent businesses under the law, franchisors must delegate the power to set prices to franchisees, whereas corporate chains can control downstream prices directly. I examine whether it matters empirically who, either the franchisor or the franchisee, gets to choose downstream prices, and if so, why.

After discussing a number of reasons why prices chosen by franchisees may differ from those that a franchisor would pick, I use data from all restaurant chains in the metropolitan Pittsburgh and Detroit areas to show that there is price dispersion in fast-food franchising. I then show that the amount of price dispersion relates to the amount of franchising in a way that suggests that: 1) franchisors are not able to control franchisees' prices indirectly to the same extent that they control company-owned unit prices; and 2) the prices in franchised and corporate units are systematically different. Finally, I show that prices are systematically lower in corporate restaurants. This suggests that the reason behind the price differentials is not franchisor opportunism, but more likely double marginalization or, potentially, the existence of positive horizontal externalities among restaurants in a chain.

Economic Issues in Vaccine Purchase Arrangements

David S. Salkever and Richard G. Frank

NBER Working Paper No. 5248
September 1995
JEL No. I1
Health Care. Health Economics, Industrial Organization

Federal purchases of major childhood vaccines account for roughly half of the total market for these vaccines. This paper examines federal purchasing practices in the context of the recent literature on bidding and procurement, and compares these practices to UNICEF vaccine procurement arrangements. Federal contracts were awarded to a single winner, and the firms eligible to bid were limited in number (since the number of U.S. licensed firms is small). Since production capacity cannot be expanded quickly, and the federal share of purchases is large, we hypothesize that firms' bid prices will be higher for larger contracts. This paper analyzes contracts over 1977–1992 to determine the relationship between contract size and price, as well as the effects on contract prices of the National Vaccine Injury

Compensation Program enacted in 1987 and changes in the number of firms in the market. Our results provide equivocal support for a positive relationship between size and price and some evidence of a positive effect on price of the injury compensation program.

Culture and Language

Edward P. Lazear

NBER Working Paper No. 5249
September 1995
JEL Nos. D3, J00, J15, J18
Labor Studies

Common culture and common language facilitate trade between individuals. Minorities have incentives to become assimilated and to learn the majority language so that they have a larger pool of potential trading partners. The value of assimilation is larger to an individual from a small minority than to one from a large minority group. When a society has a very large majority of individuals from one culture, individuals from minority groups will be assimilated more quickly. Assimilation is less likely when the immigrants' native culture and language are represented broadly in their new country. Also, when governments protect minority interests directly, incentives to be assimilated into the majority culture are reduced. Both factors may explain the recent rise in multiculturalism.

Individuals do not internalize the social value of assimilation properly. They ignore the benefits that others receive when they learn the majority language and become assimilated. In a pluralistic society, a government policy that encourages diverse cultural immigration over concentrated immigration is likely to increase the welfare of the native population. In the absence of strong offsetting effects, policies that encourage multiculturalism reduce the amount of trade and have adverse consequences on welfare. Conversely, policies that subsidize assimilation and the acquisition of majority language skills can be socially beneficial.

I test and confirm the theory by examining U.S. Census data. It reveals that the likelihood that an immigrant will learn English is related inversely to the proportion of the local population that speaks his or her native language.

Factors Determining Participation of the Elderly in SSI

Kathleen McGarry

NBER Working Paper No. 5250
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JEL No. I3
Aging

The same low participation rates that plague many welfare programs have been observed among the elderly who are eligible for Supplemental Security Income (SSI). A number of hypotheses have been offered to explain the low enrollment, but none has attracted universal acceptance. In this paper I use the Survey of Income and Program Participation to examine the participation of the elderly in SSI. Because of the high quality of the data, I am able to determine eligibility more accurately than in most previous studies. In this sample, only 56 percent of those whom I determine to be eligible for SSI presently are receiving benefits. I model the decision to participate as a probit equation, but modify the likelihood function to account for measurement error in the expected benefit. The results indicate that participation is determined primarily by the financial situation of the eligible individuals. Although all those eligible for SSI are poor, those with little in the way of other resources are significantly more likely to participate. This finding differs from widespread beliefs that eligible individuals are discouraged by the difficulty of the application process, or that many are uninformed about the program.

Optimal Inflation Targets, "Conservative" Central Banks, and Linear Inflation Contracts

Lars E. O. Svensson

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JEL Nos. I20, I30
Labor Studies

Inflation-target regimes (including those of New Zealand, Canada, the United Kingdom, Sweden, and Finland) are interpreted as having *explicit* inflation targets and *implicit* output/unemployment targets. Without persistence in output/unemployment, delegating monetary policy to an independent central bank with a discretionary instrument and an optimal inflation target can: eliminate the discretionary inflation bias; mimic the optimal linear inflation contract suggested by Walsh, and extended by Persson and Tabellini; and achieve the equilibrium corresponding to an optimal rule with commitment. Thus an "inflation-target-conservative" central bank, with an inflation target equal to the socially best inflation rate minus any inflation bias, dominates a Rogoff "weight-conservative" central bank with increased weight on inflation stabilization, which increases the variability of output/unemployment in a suboptimal way.

With persistence in output/unemployment, a constant inflation target is equivalent to a constant linear inflation contract. They both can eliminate the average inflation bias, but not the state-contingent portion of the inflation bias. Inflation variability is too high, and output variability too low, compared to the equilibrium corresponding to an optimal rule. An optimal state-contingent inflation target can remove all inflation bias; but, in contrast to an optimal state-contingent linear inflation contract, it still leaves inflation variability too high. Delegation with an optimal state-contingent inflation target to a Rogoff "weight-conservative" central bank then can achieve the equilibrium corresponding to an optimal rule. Inflation targets on average may be exceeded, and they may have imperfect credibility. Nevertheless they may reduce inflation usefully, and they appear much easier to implement than linear inflation contracts.

Unemployment Insurance and Precautionary Saving

Eric M. Engen and Jonathan Gruber

NBER Working Paper No. 5252
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JEL Nos. J65, H53, E21
Labor Studies, Public Economics

We consider both theoretically and empirically the effect of unemployment insurance (UI) on precautionary savings behavior. Simulations of a stochastic life-cycle model suggest that increasing the generosity of UI will lower the asset holdings of the median worker substantially, and that this effect will both rise with unemployment risk and fall with worker age. We test these implications by matching data on potential UI replacement rates to asset holdings in the Survey of Income and Program Participation. Our empirical results are quite consistent with the predictions of the model. We find that raising the replacement rate for UI by 10 percentage points lowers financial asset holdings by 1.4 to 5.6 percent, so that UI crowds out up to half of private savings for the typical unemployment spell. We also find that this effect is stronger for those facing higher unemployment risk and weaker for older workers.

Multinational Corporations, Outsourcing, and American Wage Divergence

Matthew J. Slaughter

NBER Working Paper No. 5253
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JEL Nos. F21, F23, J31
International Trade and Investment, Labor Studies

Many economists studying America's wage divergence in the 1980s have concluded that its primary cause was a shift within industries in relative labor demand toward those with more skills. Following the modeling framework and empirical methods developed in Slaughter (1993), I try in this paper to determine the extent to which outsourcing by multinational corporations contributed to this shift in labor demand. I use data from the Bureau of Economic Analysis on U.S. manufacturing multinationals in the 1980s. My main finding is that the data are inconsistent with U.S. multinationals having outsourced heavily in the 1980s.

First, I construct a set of stylized facts about the employment, investment, and production patterns of these firms. I find that most of these facts are inconsistent with widespread outsourcing. Second, to test more rigorously whether these firms substitute between U.S. and foreign production labor, I estimate their factor-price elasticities of demand in a translog-cost-function specification. I find that home and foreign production labor seem to be weak price substitutes at best, and in fact may be price complements. Taken together, these findings indicate that multinational outsourcing contributed very little to rising wage inequality.

Labor Income Indices Designed for Use in Contracts Promoting Income Risk Management

Robert J. Shiller and Ryan Schneider

NBER Working Paper No. 5254
September 1995
JEL No. J31
Economic Fluctuations

In this paper, we create indexes of labor income for groups of individuals, using data from the Panel Study of Income Dynamics. People are grouped according to jobs, education level, and skill category. The groups are defined so that relatively few people move between them. For each of the groupings, we generate a labor income index; we then describe similarities between pairs of indexes and between indexes and individual labor incomes. We argue that indexes like those presented here someday might be used in settlement formulas in contracts promoting income risk management.

Trade and Production Networks of U.S. MNCs and Exports by Their Asian Affiliates

Robert E. Lipsey

NBER Working Paper No. 5255
September 1995
JEL Nos. F21, F23
International Trade and Investment

Network connections within multinational corporations (MNCs) seem to improve export market shares for their Asian affiliates. In particular, Asian affiliates of U.S.

MNCs export more to markets where their parent firms' exports to affiliates are larger, and less to markets where their parent firms' exports go more to nonaffiliates. However, the latter effect is much smaller per dollar of parent exports than the former effect. These relationships are fairly consistent across industries and markets, across markets within two industries, across industries for two affiliate home countries, and across exporters and industries for individual markets.

Organization Structure and Credibility: Evidence from Commercial Bank Securities Activities Before the Glass–Steagall Act

Randall S. Kroszner and Raghuram G. Rajan

NBER Working Paper No. 5256
September 1995
Corporate Finance

This paper investigates how organizational structure can affect a firm's ability to compete. In particular, we examine the two ways in which U.S. commercial banks organized their investment banking operations before the 1933 Glass–Steagall Act forced them to leave the securities business: as an internal securities department within the bank, and as a separately incorporated and capitalized securities affiliate. We document a strong movement toward the use of the affiliate structure during the 1920s; regulation does not appear to explain this evolution. While departments underwrote seemingly higher-quality firms and securities than comparable affiliates did, the departments obtained lower prices for the issues they underwrote. This is consistent with the hypothesis that there was a perception of potential conflicts of interest when lending and underwriting were combined closely in the departmental structure. We find that bank managers were concerned about such perceptions during this period.

We then develop further tests to support the view that by distancing underwriting activities from lending operations, banks could certify the quality of the issues they underwrote more credibly, thereby obtaining higher prices for them. Our results suggest that internal organization indeed may affect the activities and efficiency of a firm. They also suggest that bank regulators' interest in "firewalls" between commercial and investment banking may be reasonable, but that the market may propel banks to adopt an internal structure that would address regulators' concerns.

The Impact of Child Health and Family Inputs on Child Cognitive Development

Robert Kaestner and Hope Corman

NBER Working Paper No. 5257
September 1995
Health Economics

In this paper we analyze the impact of child health and other family characteristics on the cognitive achievement of children between the ages of five and nine. We estimate both cross-sectional and fixed-effects models using data from the National Longitudinal Survey of Youth. Several of our results challenge the conclusions found in the existing literature. First, we find only a weak relationship between several measures of child health and cognitive development. Second, we find that additional maternal schooling does not improve the child's cognitive achievement. Finally, our estimates of the effect of mother's labor force participation suggest that it has a positive impact on a child's cognitive achievement.

What Have Macroeconomists Learned About Business Cycles from the Study of Seasonal Cycles?

Jeffrey A. Miron and J. Joseph Beaulieu

NBER Working Paper No. 5258
September 1995
JEL Nos. E30, E32
Economic Fluctuations, Monetary Economics

This paper argues that analysis of seasonal fluctuations can shed light on the nature of business cycle fluctuations. The fundamental reason is that in many instances, identifying restrictions about seasonal fluctuations are more believable than analogous restrictions about nonseasonal fluctuations. We show that seasonal fluctuations provide good examples of shifts in preference and synergistic equilibriums. We also find evidence against production smoothing and in favor of unmeasured variation in labor and capital utilization. In some industries capacity constraints appear to bind.

Globalization, Convergence, and History

Jeffrey G. Williamson

NBER Working Paper No. 5259
September 1995
Development of the American Economy

There were three epochs of growth experience after the mid-19th century for what is now called the "OECD club": the late-19th century; the middle years between 1914 and 1950; and the late-20th century. The late-19th and the late-20th century epochs saw overall fast growth and convergence: poor countries tended to grow even faster than rich ones, and the economic gap between rich and poor countries diminished. The middle years saw overall slow growth and divergence: poor countries tended to grow even slower than rich ones, and the economic gap between rich and poor countries widened. Since the middle years also involved economic autarky and "deglobalization," while the other periods saw increasing globalization in world commodity and factor markets, history offers an unambiguous positive correlation between globalization and convergence. But is that correlation spurious? When I examine the pre–World War I years in detail, I find that the correlation is causal: the globalization of commodity and factor markets served to play a critical, perhaps *the* critical, role in contributing to convergence. A century and a half of OECD club history also suggests that economists should pay more attention to who gains and who loses from convergence, since the answers may help to determine whether proglobalization or antiglobalization policies will persist.

Machine Replacement and the Business Cycle: Lumps and Bumps

Russell Cooper, John C. Haltiwanger, and Laura Power

NBER Working Paper No. 5260
September 1995
Economic Fluctuations

This paper explores cyclical fluctuations in investment attributable to discrete changes in the plant's stock of capital. We focus on a machine replacement problem in which a producer decides whether to replace its entire existing stock of capital with new machinery and equipment. This decision is undertaken in a stochastic, dynamic environment that allows us to characterize the relationship between lumpy investment and the state of the aggregate economy. We supplement our theoretical results with numerical and empirical analyses of the dynamics of lumpy investment at the plant level and the associated aggregate implications. The dynamics are surprisingly rich, since they represent the interaction among a replacement cycle, the cross-sectional distribution of the age of the capital stock, and the state of the aggregate economy.

Our empirical analysis of these dynamics is based on plant-level investment data for the Longitudinal Research Database for 1972–91. Overall, we find that the frequency of lumpy investment activity is higher during periods of high economic activity, and is more likely as capital ages. These results are consistent with the predictions of our theoretical model. Nonetheless, the predicted path of aggregate investment that neglects the interaction of the nonflat hazard and the cross-sectional distribution of the age of the capital stock tracks actual aggregate investment quite well. However, ignoring the fluctuations in the cross-sectional distribution can yield predictable nontrivial errors in forecasting changes in aggregate investment during periods following large swings in aggregate investment.

Demographic Dynamics, Labor Force Participation, and Household Asset Accumulation: Case of Japan

Albert Ando and Andrea Moro

NBER Working Paper No. 5261
September 1995
JEL Nos. D12, E21, J10
Economic Fluctuations

We summarize a dynamic model of the demographic structure of Japan. It is capable of tracing the dynamic development of the Japanese population, including the distribution of families by age, sex, and marital status of the head, as well as by the number and age of children and other dependents. We combine this model with a specification of the processes generating family income and consumption, and use it to generate the pattern of aggregate income, saving, and asset accumulation for 1985–2090 under alternative assumptions about fertility. The results suggest that the saving–income ratio for Japan will increase slightly in the immediate future as the number of children per family declines sharply, and then will fall moderately as the proportion of older persons in the population increases. Quantitative results depend critically on the labor force participation rate of older persons and on the probability of older persons merging into younger households. However, unless some major changes in Japanese saving behavior take place, our analysis suggests that Japan will have an unusually high net worth–income ratio as its population stabilizes or begins to decline.

Asset Pricing Lessons for Modeling Business Cycles

Michele Boldrin, Lawrence J. Christiano, and Jonas Fisher

NBER Working Paper No. 5262
September 1995
JEL Nos. I31, O23
Asset Pricing, Economic Fluctuations

We develop a model that explains the observed equity premium and average risk-free rate, without implying counterfactually high risk aversion. The model also does well in accounting for business cycle phenomena. With respect to the conventional measures of business cycle volatility and comovement with output, the model does roughly as well as the standard business cycle model. On two other dimensions, the model's business cycle implications actually are improved. Because of enhanced internal propagation, the model explains the fact that there is positive persistence in output growth; the model also provides a resolution to the "excess sensitivity puzzle" for consumption and income. The key features of the model are habit persistence preferences and a multisector technology with limited intersectoral mobility of factors of production.

What Do Budget Deficits Do?

Laurence M. Ball and N. Gregory Mankiw

NBER Working Paper No. 5263
September 1995
Economic Fluctuations, Monetary Economics

This paper discusses in four steps the effects of budget deficits on the economy. First, it reviews standard theory about how budget deficits influence saving, investment, the trade balance, interest rates, exchange rates, and long-term growth. Second, it offers a rough estimate of the magnitude of some of these effects. Third, it discusses how budget deficits affect economic welfare. Finally, it considers the possibility that continuing budget deficits in a country could lead to a "hard landing" in which the demand for the country's assets suddenly collapses.

An Empirical Analysis of the Welfare Magnet Debate Using the NLSY

Phillip B. Levine and David J. Zimmerman

NBER Working Paper No. 5264
September 1995
Labor Studies

This paper examines the extent to which differences in the generosity of welfare across states leads to interstate migration. Using microdata from the National Longitudinal Survey of Youth (NLSY) between 1979 and 1992, we employ a quasi-experimental design that uses the categorical eligibility of the welfare system. We compare the pattern of cross-state moves among poor single women with children who are likely to be eligible for benefits to the pattern observed among other poor households. We find little evidence that welfare-induced migration is a widespread phenomenon.

Is There an Equity–Efficiency Trade-Off in School Finance? Tiebout and a Theory of the Local Public Goods Producer

Caroline M. Hoxby

NBER Working Paper No. 5265
September 1995
Public Economics

New empirical work shows that the degree of competition among public providers of local public goods, or between public and private providers of local public goods, matters. This evidence needs a theory of the local public goods producer. Tiebout's hypothesis spawned a literature that gives us a useful theory of the consumer, and the same mechanism can generate a theory of the local producer of public goods. This potential has remained largely undeveloped, apart from Tiebout's vision of the local public goods producer as an entrepreneur, which is unrealistic because local public goods are nonverifiable. The Tiebout mechanism does not operate in alternative models of the local public goods producer, including the bureaucracy and agenda models. None of these models is useful for predicting how producers of local public goods react to policies, such as equalization of school spending, that change the structure of local public finance.

This paper builds a theory of the producer that draws upon Tiebout's mechanism and the theory of incentives for regulation. The essential insight is that Tiebout's mechanism generates information that can be used in regulatory schemes to achieve lower costs for any given provision of local public goods. Thus, we face a fundamental trade-off between promoting equitable consumption of the public good and promoting efficiency (cost minimization) in the *production* of the public good. This trade-off exists even when equity in consumption generates positive externalities, as is often suggested of the consumption of schooling. I show that when the Tiebout mechanism for schools is weakened by state-level school funding, per-pupil costs rise and the growth of educational attainment falls. This latter fact implies that losses from inefficient production generally outweigh gains from equalized consumption.

Forbidden Payment: Foreign Bribery and American Business After 1977

James R. Hines, Jr.

NBER Working Paper No. 5266
September 1995
JEL Nos. F23, H87, O73
Public Economics

The United States prohibits American individuals and corporations from bribing foreign government officials. Legislation enacted in 1976 and 1977 stipulates tax penalties, fines, and even prison terms for executives of American companies that pay illegal bribes. This paper examines the effect of that legislation on the operations of U.S. firms in bribe-prone countries after 1977. Four separate indicators reveal that U.S. business activities in those countries fell sharply after passage of the Foreign Corrupt Practices Act of 1977. These results suggest that this unilateral action by the United States served to weaken the competitive positions of American firms without significantly reducing the importance of bribery to foreign business transactions.

Do Financing Constraints Explain Why Investment Is Correlated with Cash Flow?

Steven N. Kaplan and Luigi Zingales

NBER Working Paper No. 5267
September 1995
Corporate Finance, Public Economics

This paper investigates the sources of the correlation between corporate cash flow and investment. We undertake an in-depth analysis of the 49 low-dividend firms identified by Fazzari, Hubbard, and Petersen (1988) as having an unusually high sensitivity of investment to cash flow. We find that in only 15 percent of firm-years is there some question as to a firm's ability to access internal or external funds to increase investment. Strikingly, those firms that appear less financially constrained exhibit a significantly greater sensitivity of investment to cash flow than firms that appear more financially constrained. We find this pattern for the entire sample period, for subperiods, and for individual years. These results indicate that a higher sensitivity cannot be interpreted as evidence that a firm is more financially constrained. We discuss how and why the opposite may be true. These findings challenge much of the existing evidence on the effects of financial constraints.

Why Do Increased Arrest Rates Appear to Reduce Crime: Deterrence, Incapacitation, or Measurement Error?

Steven D. Levitt

NBER Working Paper No. 5268
September 1995
JEL No. K42
Public Economics

A strong, negative empirical correlation exists between arrest rates and reported crime rates. While this relationship often has been interpreted as support for the deterrence hypothesis, it is equally consistent with incapacitation effects, and/or a spurious correlation that would be induced by measurement error in reported crime rates. This paper attempts to discriminate among deterrence, incapacitation, and measurement error as explanations for the empirical relationship between arrest rates and crime.

Using a modified version of the techniques of Griliches and Hausman (1986) for dealing with measurement error in panel data, this paper first demonstrates that the presence of measurement error does not appear to explain the observed relationship between arrest rates and crime rates. To differentiate between deterrence and incapacitation, I examine the impact of changes in the arrest rate for one crime on the rate of other crimes. In contrast to the effect of increased arrests for one crime on the commission of that crime, in which deterrence and incapacitation are indistinguishable, it can be demonstrated that these two forces act in opposite directions when looking across a variety of crimes. Incapacitation suggests that an increase in the arrest rate for one crime will reduce all crime rates; deterrence predicts that an increase in the arrest rate for one crime will lead to a rise in other crimes as criminals substitute away from the first crime. Empirically, deterrence appears to be the more important factor, particularly for property crimes.

Inside Money, Outside Money, and Short-Term Interest Rates

V. V. Chari, Lawrence J. Christiano, and Martin Eichenbaum

NBER Working Paper No. 5269
September 1995
JEL Nos. E3, E4, E5
Economic Fluctuations, Monetary Economics

This paper presents a quantitative general equilibrium model with multiple monetary aggregates. The framework incorporates a banking sector and distinguishes among M1, the monetary base, currency, and various measures of reserves: total, excess, and nonborrowed. We use a variant of the model to analyze two sets of empirical facts: first, different monetary aggregates covary differently with short-term nominal interest rates. Broad monetary aggregates such as M1 and the monetary base covary positively with current and future values of short-term interest rates, while the nonborrowed reserves of banks covary negatively with current and future interest rates. Observations such as this "sign switch" are at the core of recent debates about the effects of monetary policy actions on short-term interest rates. According to our model, the sign switch occurs because movements in nonborrowed reserves are dominated by exogenous shocks to monetary policy, while movements in the base and M1 are dominated by endogenous responses to nonpolicy shocks. Second, broad monetary aggregates covary positively with output. We quantify the Friedman and Schwartz hypothesis that this covariation reflects the effects of exogenous shocks to monetary policy, and the hypothesis that they reflect the endogenous response of monetary aggregates to shocks in the private economy.

More Bad News for Smokers: The Effects of Cigarette Smoking on Labor Market Outcomes

Phillip B. Levine, Tara A. Gustafson, and Ann D. Velenchik

NBER Working Paper No. 5270
September 1995
Health Economics, Labor Studies

This paper uses data from the National Longitudinal Survey of Youth to examine the effect of smoking on wages and employment. The panel nature and household structure of these data enable us to implement methods to account for differences in observed and unobserved individual characteristics that may be correlated with both smoking and wages. We estimate changes in wages associated with changes in smoking behavior and models that use sibling comparisons to address the potential problem of heterogeneity. Estimates from alternative specifications all indicate that smoking reduces wages by roughly 4 to 8 percent. We observe no robust, statistically significant effect on employment.

State and Local Pension Plans

Olivia S. Mitchell and Roderick Carr

NBER Working Paper No. 5271
September 1995
Aging, Labor Studies

This paper examines the role and function of pension plans covering state and local government employees in the United States. Covering about 16 million employees (including teachers, fire fighters, police, members of the judiciary, and many other state and local employees), these plans manage a substantial stock of financial assets —close to $1 trillion—and receive annual contributions from employees and government revenues totaling about $56 billion. Using data gathered from a variety of different sources, some of which only recently have become available, we describe the benefits, financing, and management of these plans, and identify some of the prominent challenges facing them in the next decade.

Open Regionalism in a World of Continental Trade Blocs

Shang-Jin Wei and Jeffrey A. Frankel

NBER Working Paper No. 5272
September 1995
International Trade and Investment

Continental trade blocs are emerging in many parts of the world almost in tandem. If trade blocs are required to satisfy the McMillan criterion of not lowering their trade volume with outside countries, then they have to engage in a dramatic reduction of trade barriers against nonmember countries. That may not be politically feasible. On the other hand, in a world of simultaneous continental trade blocs, an open regionalism in which trade blocs undertake relatively *modest* external liberalization usually can produce Pareto improvement. In the bilateral trade data for 1970–92, there are indeed regions that, while exhibiting an inward trade bias, nevertheless are consistent with this notion of open regionalism.

The Effects of Low Birthweight and Other Medical Risk Factors on Resource Utilization in the Preschool Years

Hope Corman

NBER Working Paper No. 5273
September 1995
Health Economics

This study compares the utilization of resources of preschool-aged children who are at medical risk with that of their healthier preschool-aged peers. Medical risk is defined as having been born at low birthweight, having an activity limitation, or having a chronic health or handicapping condition. The resources include: child care, preschool, kindergarten, Head Start programs, and medical resources. The study uses two distinct datasets: the National Health Interview Survey's Child Health Supplement of 1988, with approximately 2500 children aged 3 to 5; and the National Household Education Survey of 1991, which consisted of about 6700 children who were aged 3 to 5. To explore differences between at-risk and healthier peers, I hold constant a variety of social and economic factors.

I find consistently that at-risk preschool-aged children are more likely to become hospitalized and are less healthy than their peers who are not at risk. In addition, they are more likely to delay entry into kindergarten. There is no evidence for differences in the amount or type of child care, or in mothers' labor force participation. There is some evidence that the at-risk children consume more preschool resources.

Does Measured School Quality Really Matter? An Examination of the Earnings–Quality Relationship

James J. Heckman, Anne Layne-Farrar, and Petra Todd

NBER Working Paper No. 5274
September 1995
Labor Studies

This paper examines the economic and empirical foundations of the aggregate evidence on the effect of schooling quality on earnings. We present a common framework that nests all previous studies as special cases. We discuss two crucial identifying assumptions and test them. The first assumption is the absence of interactions between region of birth and region of residence in the return to schooling. This rules out patterns of migration on the basis of realized earnings in the destination state; using 1970, 1980, and 1990 Census data, we decisively rejected this hypothesis. A second assumption is that log-earnings-equations are linear, or nearly linear, in schooling. This assumption is false. We find that estimated earnings–quality relationships are sensitive to specification of the earnings function. When false linearity assumptions are relaxed, the only effect of measured schooling quality is on the returns for college graduates. The evidence for an aggregate earnings–quality relationship is weak once false empirical restrictions are relaxed.

Rate Regulation and the Industrial Organization of Automobile Insurance

Sharon Tennyson and Susan J. Suponcic

NBER Working Paper No. 5275
September 1995
JEL Nos. G22, L51, L11

This paper analyzes the impact of rate regulation on the structure of insurance markets for private passenger automobile insurance. We argue that states' restrictions on automobile insurers' rates of return will distort the structure of the market by distorting insurers' entry and output decisions. Cross-sectional analysis of the numbers of firms and the relative market shares of firms of different organizational characteristics supports this argument, especially for those states that impose the most stringent regulation. The analysis suggests that increased regulatory stringency lowers the total number of firms selling in the market, and lowers the number of low-cost and national firms in the market. The market shares of these latter two groups of firms also are lowered significantly by increased regulatory stringency. These findings hold even after we control for other factors that may influence the relative prevalence of these firms in the market, and they are robust to the assumption that regulatory stringency itself in a state is determined partially by the number and market shares of large, low-cost producers.

Growth and Convergence in the Asia–Pacific Region: On the Role of Openness, Trade, and Migration

Alan M. Taylor

NBER Working Paper No. 5276
September 1995
JEL Nos. E22, F43, O40
Development of the American Economy

This paper examines the relationship among openness, trade, and migration in the Asia–Pacific region after 1970. Conventional reduced-form empirical-growth specifications are augmented by an appeal to structural modeling, an extension that reveals a rich set of interactions among policy, distortions, factor accumulation, and growth. A broad array of openness measures play a major role in the successful growth performance of the Asia–Pacific region, a key channel being the distortion–investment nexus. In contrast, the results suggest little role for migration as a quantitatively significant growth determinant, at least at the macro level; this is no surprise in this area of historically low net rates of migration. However, I find that within-sample prediction for the Asia–Pacific region is harder to achieve: "good luck" as well as "good policy" played a part.

Employee Ownership, Employee Attitudes, and Firm Performance

Douglas Kruse and Joseph Blasi

NBER Working Paper No. 5277
September 1995
Labor Studies

Employee ownership in U.S. companies has grown substantially in the past 20 years. This paper reviews and provides some meta-analyses on the accumulated evidence concerning the prevalence, causes, and effects of employee ownership; it covers 25 studies of employee attitudes and behaviors, and 27 studies of productivity and profitability (with both cross-sectional and pre/post comparisons).

Attitudinal and behavioral studies tend to find higher employee commitment among employee-owners but mixed results on satisfaction, motivation, and other measures. Perceived participation in decisions in itself is not increased automatically through employee ownership, but may interact positively with employee ownership in affecting attitudes.

While few studies individually find clear links between employee ownership and firm performance, meta-analyses favor an overall positive association with performance for employee stock ownership plans and for several cooperative features. The dispersed results among attitudinal and performance studies indicate the importance of firm-level employee relations, human resource policies, and other circumstances.

Supplier Relations and Adoption of New Technology: Results of Survey Research in the U.S. Auto Industry

Susan Helper

NBER Working Paper No. 5278
September 1995
Productivity

Using an original data source, this paper investigates the circumstances under which firms adopt computer numerical control (CNC), an important type of flexible automation that can increase significantly productivity, product variety, and quality. The paper shows that arms'-length supplier/customer relationships are a significant barrier to CNC adoption, even when CNC would improve efficiency. For firms in which CNC would be efficient, but that currently receive little commitment from their customers, an increase in contract length of one year would increase the adoption rate by 30 percent.

These results have theoretical implications in two areas. First, the paper integrates questions of appropriability into the technical change literature, by adding supplier relations as a determinant of technology adoption. Second, the paper extends transaction-cost analysis, by relaxing the assumption that agents' private maximizing behavior always will produce organizational forms that maximize social efficiency.

The Term Structure of Interest Rates and Its Role in Monetary Policy for the European Central Bank

Arturo Estrella and Frederic S. Mishkin

NBER Working Paper No. 5279
September 1995
JEL Nos. E5, E17
Monetary Economics

This paper examines the relationship of the term structure of interest rates to monetary policy instruments and to subsequent real activity and inflation in both Europe and the United States. The results show that monetary policy is an important determinant of the term structure spread, but it is unlikely to be the only determinant. In addition, there is significant predictive power for both real activity and inflation. The yield curve is thus a simple and accurate measure that should be viewed as one piece of useful information that, along with other information, can be used to help guide European monetary policy.

Asia–Pacific Capital Markets: Integration and Implications for Economic Activity

Menzie Chinn and Michael Dooley

NBER Working Paper No. 5280
September 1995
JEL Nos. F36, F41
International Finance and Macroeconomics

The apparent success of several East Asian countries in sterilizing capital inflows seems to contradict findings of high capital mobility. This paper argues that empirical studies examining money market rates may be misleading, since most lending is mediated through domestic banking systems. In developing countries with repressed domestic financial markets, yields on bank deposits might be tied closely to international interest rates, but bank loan rates might be more independent. We use a simple open-economy macro model incorporating bank credit to motivate alternative tests of financial market integration. We find that capital inflows affect bank lending in cases in which deposit and loan markets are integrated with world markets, and hence in which sterilization is not effective. In cases in which loan rates are more independent, sterilization seems to be more effective. Next, we examine the effect of bank lending on economic activity. The data suggest that the link between bank credit and investment is important in countries with isolated bank loan markets.

Would Privatizing Social Security Raise Economic Welfare?

Martin Feldstein

NBER Working Paper No. 5281
September 1995
JEL No. H55
Public Economics

A funded social security retirement program would imply a larger capital stock and a higher level of real income than an unfunded program that provides the same level of benefits. The transition from an unfunded program to a funded program that does not reduce the benefits of existing retirees or the present value of the benefit entitlements of existing employees would, however, require substituting explicit government debt for the equally large implicit debt of the unfunded program.

This paper shows that such a debt-financed transition from an unfunded program to a funded program is not just a change of form without economic effects. Such a debt-financed transition would raise economic welfare if three conditions are met: 1) the marginal product of capital exceeds the rate of economic growth; 2) the capital intensity of the economy is below the welfare-maximizing level (that is, the marginal product of capital exceeds the appropriate consumption discount rate); and 3) the rate of economic growth is positive.

Illustrative calculations based on the U.S. experience since 1960 suggest that the present value of the gain from a debt-financed transition to a funded program would exceed substantially the current level of GDP. More explicitly, even with a relatively high real consumption discount rate of 4.4 percent, the present value gain would be about 1.5 dollars per dollar of current net social security wealth, or about $17 trillion.

Consumer Durables and Inertial Behavior: Estimation and Aggregation of (*S,s*) Rules

Orazio P. Attanasio

NBER Working Paper No. 5282
September 1995
JEL Nos. C5, E2
Economic Fluctuations

This paper presents an (*S,s*) model for automobile consumption and estimates it using a dataset of U.S. households. The model allows for unobserved heterogeneity in both the target level and the band width, takes into account the possibility of a zero desired level, constrains the band to be nonnegative, and allows asymmetric bands.

The model is estimated on a novel dataset that contains information on both stock values and automobile expenditure for a large number of households observed over a period of a year. The (*S,s*) rule is specified in terms of the ratio of car stock to nondurables. The shortcuts usually employed in the empirical literature on (*S,s*) rules can be avoided thanks to the richness of the dataset and the rigorous specification of the stochastic model.

Having estimated the model and considered "goodness of fit" measures, I consider aggregation issues. First, I present a number of negative results. Then, I consider several simulations aimed at evaluating the effects induced by inertial behavior on aggregate dynamics.

Is Regionalism Simply a Diversion? Evidence from the Evolution of the EC and EFTA

Tamim Bayoumi and Barry Eichengreen

NBER Working Paper No. 5283
October 1995
JEL Nos. F0, F1
International Trade and Investment

This paper considers the impact on trade of preferential arrangements in Europe since the 1950s. Using a first-difference version of the gravity model, we find that the EC and EFTA altered the pattern of international trade. We also find evidence of trade diversion in several cases, notably that of the EC in the 1960s.

Macroeconomic Forecasts and Microeconomic Forecasters

Owen Lamont

NBER Working Paper No. 5284
October 1995
JEL Nos. D82, E17
Monetary Economics

In the presence of principal-agent problems, published macroeconomic forecasts by professional economists may not measure expectations. Forecasters may use their forecasts to manipulate beliefs about their ability. I test a cross-sectional implication of models of reputation and revelation of information. I find that as forecasters become older and more established, they produce more radical forecasts. Since these more radical forecasts in general are less accurate, the accuracy of ex post forecasts grows significantly worse as forecasters become older and more established. These findings indicate that reputational factors are at work in professional macroeconomic forecasts.

Models of Currency Crises with Self-Fulfilling Features

Maurice Obstfeld

NBER Working Paper No. 5285
October 1995
JEL Nos. F33, E58
International Finance and Macroeconomics, International Trade and Investment

The discomfort a government suffers from speculation against its currency determines the strategic incentives of speculators and the scope for multiple currency-market equilibriums. After describing an illustrative model in which high unemployment may cause an exchange rate crisis with self-fulfilling features, this paper reviews some other self-reinforcing mechanisms. Recent econometric evidence seems to support the practical importance of these mechanisms.

Sectoral Solow Residuals

Craig Burnside, Martin Eichenbaum, and Sergio T. Rebelo

NBER Working Paper No. 5286
October 1995
JEL Nos. D2, E3, O4
Economic Fluctuations

This paper presents measures of technology shocks corrected for capital utilization for aggregate and disaggregated (two-digit Standard Industrial Classification code) industries. We correct for variations in capital utilization by employing industrial electrical use as a measure of capital services. In contrast, the standard measures of technology shocks used in the Real Business Cycle (RBC) literature are based on economywide data, and assume that capital services are proportional to the stock of measured capital. To assess the impact of these differences, we contrast selected properties of the competing technology shock measures. We argue that the properties of technology shocks for the manufacturing sector are quite different from those used in the RBC literature. We also find that correcting for capital utilization has important implications for the properties of the Solow residual.

The Effects of Special Saving Programs on Saving and Wealth

James M. Poterba, Steven F. Venti, and David A. Wise

NBER Working Paper No. 5287
October 1995
JEL Nos. J14, J28
Aging, Public Economics

Individual saving through targeted retirement saving accounts—IRAs and 401(k)s—grew rapidly in the United States during the 1980s. The microeconomic evidence presented in this paper suggests that most of the contributions to these programs represent new saving that would not have occurred otherwise. We compare the micro evidence with macro saving, measured by National Income and Product Accounts and Flow of Funds data.

The Schooling Quality–Earnings Relationship: Using Economic Theory to Interpret Functional Forms Consistent with the Evidence

James J. Heckman, Anne Layne-Farrar, and Petra Todd

NBER Working Paper No. 5288
October 1995
JEL Nos. J31, I21, H40
Labor Studies

This paper investigates the economic and empirical foundations of the evidence relating earnings to schooling quality. We replicate the Card–Krueger model for Census years 1970, 1980, and 1990, and find that it consistently produces a strong relationship between schooling quality and the rate of return to schooling. We then test key identifying assumptions used by Card and Krueger and others, and reject several of them. When the assumptions are relaxed, the evidence for a strong effect of schooling quality on earning is weakened greatly.

One crucial identifying assumption is the absence of selective migration on the basis of earnings. Nonparametric tests strongly reject this hypothesis. The conventional assumption of linearity of the earnings–schooling relationship used widely in the literature also is rejected. The only surviving evidence of any effect of schooling quality is in the return to college education. We also test and reject conventional efficiency unit models of the pricing of labor services. The empirically concordant model of earnings is a model of heterogeneous human capital in which regional shocks affect the prices of less-skilled labor.

Stochastic Regime Switching and Stabilizing Policies Within Regimes

Karen K. Lewis

NBER Working Paper No. 5289
October 1995
JEL Nos. F31, G12
Asset Pricing, International Finance and Macroeconomics

This paper describes a class of stochastic stabilizing policies within asset price regimes that can be incorporated easily into the framework of regime switching proposed recently by Froot and Obstfeld (1991). In contrast to previous treatments of market-driven fundamentals within the regime, authorities stochastically counteract movements in the fundamentals before asset prices reach boundary points. This paper describes how the stabilizing intraregime intervention policies can be used to characterize the behavior of monetary authorities before fixing an exchange rate, as studied by Flood and Garber (1983). An intervention policy within target zone bands consistent with the empirical evidence also belongs to this class of policies. Furthermore, the stylized features of these intervention policies may be matched to actual data in a natural way.

Consumption Taxes: Some Fundamental Transition Issues

David F. Bradford

NBER Working Paper No. 5290
October 1995
JEL Nos. H25, H24, H20
Public Economics

A number of tax reform plans under discussion in the United States would replace the existing hybrid income-based system with a consumption-based system. In this paper, I use *uniform* (that is, single-rate) consumption and income taxes to: 1) explain how the problem of taxing "old savings" or "old capital" manifests itself in the shift from an income to a consumption base; 2) indicate the trade-offs that must be confronted in dealing with this phenomenon; 3) show how price level changes that may or may not accompany a transition affect the distribution of gains and losses; 4) sketch out how a transition might affect interest rates and asset prices (including owner-occupied housing); 5) explore the case in equity for protecting the tax-free recovery of old savings; and 6) emphasize the incentive problems that arise if savers and investors anticipate a change in the tax rate in a consumption-based system.

Discrete Choice with Social Interactions I: Theory

Steven N. Durlauf and William A. Brock

NBER Working Paper No. 5291
October 1995
JEL Nos. D6, J2, R1
Economic Fluctuations

This paper analyzes aggregate behavior when individual utility exhibits social interaction effects. We study generalized logistic models of individual choice that incorporate terms reflecting the desire of individuals to conform to the behavior of others in an environment of noncooperative decisionmaking. Multiple equilibriums in these models, which are equivalent to multiple self-consistent means for average choice behavior, will exist when the social interactions exceed a particular threshold. We also study local stability of these multiple equilibriums. We contrast the properties of the noncooperative economy with the properties of an economy in which a social planner determines the set of individual choices. Additionally, we show the model to be well suited to explaining a number of empirical phenomena, such as threshold effects in individual behavior, ethnic group fixed effects of income equations, and large cross-group differences in binary choice behavior.

Tobin's *q* and Asset Returns: Implications for Business Cycle Analysis

Lawrence J. Christiano and Jonas Fisher

NBER Working Paper No. 5292
October 1995
JEL Nos. E3, E37
Economic Fluctuations

The marginal cost of plant capacity, measured by the price of equity, is significantly procyclical. Yet the price of a major intermediate input into expanding plant capacity—investment goods—is countercyclical. The ratio of these prices is Tobin's *q*. Following convention, we interpret the fact that Tobin's *q* differs at all from unity as reflecting diminishing returns to expanding plant capacity by installing investment goods ("adjustment costs"). However, the phenomenon that interests us is not just that Tobin's *q* differs from unity, but also that its numerator and denominator have such different cyclical properties. We interpret the sign switch in their covariation with output as reflecting the interaction of our adjustment cost specification with the operation of two shocks: one that affects the demand for equity, and another that shifts the technology for producing investment goods. The adjustment costs cause the two prices to respond differently to these two shocks, and that is why it is possible to choose the shock variances to reproduce the sign switch.

These features of the model are incorporated into a modified version of a model analyzed in Boldrin, Christiano, and Fisher (1995). That model incorporates assumptions designed to help account for the observed mean return on risk-free and risky assets. We find that the various modifications not only account for the sign switch, but also continue to account for the salient features of mean asset returns.

We turn to the business cycle implications of our model. The model does as well as standard models with respect to conventional business cycle measures of volatility and comovement with output, and on one dimension the model significantly dominates standard models. The factors that help it account for prices and rates of return on assets also help it account for the fact that employment across a broad range of sectors moves together over the cycle.

The Child Care Industry: Cost Functions, Efficiency, and Quality

H. Naci Mocan

NBER Working Paper No. 5293
October 1995
JEL Nos. D24, J13, J23
Health Economics

Using a newly compiled dataset, this paper provides insights into the characteristics of the child care industry. First, there is no difference in the average quality of services produced by nonprofit versus for-profit centers. Thus nonprofit status is not a signal of higher quality.

Second, the hypothesis of relative inefficiency of nonprofit centers with respect to for-profits is unfounded. On the other hand, centers that receive public money, either from the state or federal government, which is tied to higher standards, have variable costs that are 19 percent higher than other centers.

Child care workers with 13 to 15 years of education and workers with 16 and more years of education are substitutes. Both of these groups are complements to workers with 12 years of education or less. Centers have inelastic demand for workers.

There are economies of scale in production. Controlling for the level of quality of services, a 10 percent increase in hours of children served brings about only an 8.5 percent increase in costs in the long run. There is no evidence of economies of scope, though. Serving various age groups jointly is not more efficient than serving them separately, although the issue is less clear in the case of preschoolers and school-aged children.

The cost of increasing the quality of an average center from mediocre to good is between 12 and 16 cents per hour per child.

Where the Money Goes: Medical Expenditures in a Large Corporation

Mark B. McClellan and David A. Wise

NBER Working Paper No. 5294
October 1995
JEL Nos. J14, I10
Aging, Health Care

We use a new datafile of insurance claims under employer-provided health plans to describe the pattern of expenditures in a large corporation: Who spends? On what? For how long? The description is illustrative of detail that can be distilled for other firms.

There are several noticeable features of spending: 1) The differences in the provisions of the two FIRM plans seem to have substantial effects on health care expenditures. Inpatient expenditures are a much larger fraction of the total under a first-dollar coverage plan available to hourly employees. 2) Substance abuse and other mental health disorders account for a surprisingly large fraction of health care costs. 3) The components of health care cost differ substantially across individuals, demographic groups, and plans, suggesting that further analysis of the "micro" details of medical expenditures may help to assess the probable implications of alternative insurance reforms. 4) There is substantial persistence in individual health care expenditures from year to year. Illustrative calculations suggest that this persistence may lead to considerable inequality in individual costs under demand-side insurance reforms such as those coupled with individual health account saving plans, and thus may place important limitations on plans that otherwise might be attractive.

The analysis in this paper suggests that firm data can provide important insights into the black box of expenditures under private insurance plans. Hence these data may provide a greater understanding of how plan reforms may affect expenditures.

Scale Economies, Returns to Variety, and the Productivity of Public Infrastructure

Douglas Holtz-Eakin and Mary E. Lovely

NBER Working Paper No. 5295
October 1995
JEL Nos. H40, H73, R13
Public Economics

We examine the productivity of public infrastructure in a general equilibrium context. In our model, infrastructure lowers costs in a manufacturing sector characterized by both firm-level returns to scale and industry-level external returns to variety. Infrastructure alters factor prices, intermediate prices, and the allocation of factors across sectors. The effect on manufacturing or aggregate output, however, is indeterminate. In particular, our theory suggests that the degree of monopoly power influences public capital's productivity effect.

We test the model using state-level panel data. We confirm the absence of direct effects on output, but find suggestive evidence of a positive impact of public capital on manufacturing variety as measured by the number of manufacturing establishments. These results indicate the need for future research on potentially important indirect channels by which public capital affects manufacturing productivity.

Measuring Poverty Among the Elderly

Angus Deaton and Christina H. Paxson

NBER Working Paper No. 5296
October 1995
JEL Nos. J14, I32
Aging

Poverty counts are counts of *individuals* in poverty but are calculated from *household* or *family* data on income or expenditure. The transition from one to the other requires assumptions about intrahousehold allocation, about differences in needs across different people, and about the extent of economies of scale. The number of elderly in poverty, or the number of children in poverty, is sensitive to these assumptions and to differences in living arrangements across age groups. We explore the sensitivity of poverty counts to variations in assumptions about child costs and economies of scale using data from the United States and from six large states in India.

Because living arrangements of the elderly are so different in the United States and India, the use of the latter forces us to think about household structure and poverty in the United States. We argue that the official poverty counts in the United States are compromised by unrealistically high costs of children and by unrealistically high economies of scale. We discuss how economies of scale and child costs can be estimated from the data, using identifying assumptions that label private goods and adult goods, and we make calculations based on the 1990 Consumer Expenditure Survey. We obtain plausible estimates of child costs, together with a number of interesting but hard-to-explain anomalies, when we try to estimate economies of scale.

Evaluating Mental Health Capitation Treatment: Lessons from Panel Data

Debra Sabatini Dwyer, Olivia S. Mitchell, Robert Cole, and Sylvia K. Reed

NBER Working Paper No. 5297
October 1995
Health Care

This paper evaluates a capitation-financed system of delivery for mental health services developed in Rochester, New York. We implement a cost–benefit analysis of the treatment program with three years of data and program evaluation techniques. We compare patient outcomes across randomly assigned study groups as well as across enrollment status. We find that patients enrolled in the capitation program do experience significantly lower costs without becoming sicker, even after controlling for attrition and sample selection.

Lump-Sum Distributions from Retirement Saving Plans: Receipt and Utilization

James M. Poterba, Steven F. Venti, and David A. Wise

NBER Working Paper No. 5298
October 1995
Aging, Public Economics

One of the central issues in evaluating the ongoing shift from defined-benefit to defined-contribution pension plans is the degree to which assets in defined-contribution plans will be withdrawn before plan participants reach retirement age. The annual flow of withdrawals from such plans, which are known as lump-sum distributions and which are frequently but not always associated with employment changes, has exceeded $100 billion in recent years. This flow is substantially greater than the flow of new contributions to IRAs and other targeted retirement saving programs.

This paper draws on data from the 1993 Current Population Survey and the Health and Retirement Survey to summarize the incidence and disposition of lump-sum distributions. We find that while less than half of all lump-sum distributions are rolled over into IRAs or other retirement saving plans, large distributions are substantially more likely to be saved than smaller ones are. Consequently, more than half of the dollars paid out as lump-sum distributions are reinvested. We also explore the correlation between various individual characteristics and the probability of rolling over a lump-sum distribution. This is a first step toward developing a model that can be used to evaluate the long-term effects of lump-sum distributions, or policies that might affect them, on the financial status of elderly households.

The Underrepresentation of Women in Economics: A Study of Undergraduate Economics Students

Karen E. Dynan and Cecilia Elena Rouse

NBER Working Paper No. 5299
October 1995
JEL No. A2
Labor Studies

Although women are underrepresented in the field of economics, many people see little need for intervention, arguing that women are inherently less interested in economics, or are less willing or able to acquire the math skills needed to do well in the subject. At the same time, others support active efforts to increase the number of women in the field, pointing to other possible causes of their current underrepresentation. These people argue, for example, that women are deterred from entering the field because of a lack of female role models, or that women are discouraged by an unappealing classroom environment. This study attempts to evaluate these hypotheses. We examine the factors that influence undergraduate students' decisions to become economics majors by analyzing a survey of students in the introductory economics course at Harvard University, as well as data on an entire class of students from Harvard's registrar.

We find that although women in the introductory economics course at Harvard tend to begin the course with a weaker math background than men, this does not appear to explain much of the gender difference in students' decisions about whether to major in economics. The class environment and the presence or absence of role models also do not explain much of the gender gap. On the other hand, women do less well in economics relative to their other courses than men do, and controlling for this difference in relative performance significantly diminishes the estimated gender gap. An economically large, but statistically insignificant, difference between sexes in the probability of majoring in economics remains, however. This remaining gender gap may be caused by differing tastes or information about the nature of economics. As evidence, we find that women who were considering majoring in economics when they began introductory economics were about as likely to choose economics as men were.

Money-Based Versus Rxchange Rate-Based Stabilization with Endogenous Fiscal Policy

Aaron Tornell and Andrés Velasco

NBER Working Paper No. 5300
October 1995
International Finance and Macroeconomics

We present a standard intertemporal model in which fiscal policy is determined by an optimizing but nonbenevolent fiscal authority. If the fiscal authority is impatient, a money-based stabilization provides more fiscal discipline and higher welfare for the representative agent than an exchange rate-based stabilization does. Data for Latin America stabilizations in the last quarter-century seem to confirm the notion that stabilizing by using money rather than the exchange rate helps induce politicians to reduce the fiscal deficit.

Saving and Growth: Evidence from Microdata

Christina H. Paxson

NBER Working Paper No. 5301
October 1995
JEL No. E21
Aging

This paper examines whether the observed cross-country correlation between aggregate saving rates and economic growth can be explained by models in which higher growth increases saving rates, rather than the other way around. The paper focuses on two explanations of why growth might increase saving. First, standard life-cycle theory implies that higher growth will increase the lifetime wealth of younger savers relative to older dissavers, thereby increasing the aggregate saving rate. Second, models of consumption with habit formation imply that consumption responds slowly to unexpected income growth; thus unanticipated growth can produce a higher saving rate, at least in the short run. I assess the validity of these explanations using time series of cross-sections of household income and consumption surveys from four countries: the United States, Britain, Taiwan, and Thailand. I find that in three out of the four countries there is evidence that saving behavior is consistent with the life-cycle theory, but there is simply too little life-cycle saving for higher growth to have a large effect on the aggregate saving rate. The habit formation model also implies very small effects of growth on saving rates. A large portion of the observed cross-country correlation between saving and growth cannot be explained by these models.

Labor Market Effects of Spinal Cord Injuries in the Dawn of the Computer Age

Alan B. Krueger, Douglas Kruse, and Susan Drastal

NBER Working Paper No. 5302
October 1995
JEL No. J28
Labor Studies

What effect does a severe disability have on individuals' employment and earnings? Has the computer revolution lessened the adverse labor market consequences of severe disabilities? This paper investigates the labor market effects of severe, traumatic disabilities resulting from spinal cord injuries (SCIs). We compare the employment experiences of a sample of individuals with SCIs to those of former coworkers over the same period, and to two random samples of individuals in New Jersey. The analysis is based in large part on a 1994 telephone survey of New Jersey adults who had SCIs within the past ten years. Results indicate that the occurrence of an SCI causes a steep decline in employment, hours worked, and weekly earnings, but relatively little change in wage rates for those who work. The computer revolution has the potential to expand employment opportunities for people with disabilities. Our results indicate that having computer skills is associated with higher earnings, a faster return to work, and faster earnings recovery for SCI individuals, after holding constant other variables such as education. There is no apparent earnings gap between SCI and non-SCI computer users; among those who do not use computers at work, however, the earnings of SCI employees lag behind those of non-SCI employees. Despite the benefits, individuals with SCIs are less likely to use computers than the general population, though.

The Antebellum Transportation Revolution and Factor-Price Convergence
Matthew J. Slaughter

NBER Working Paper No. 5303
October 1995
JEL Nos. F15, J31, N31
International Trade and Investment

In antebellum America an extensive network of canals and railroads was constructed that slashed transportation costs across regions. This "transportation revolution" presents an interesting case study of the factor-price convergence (FPC) theorem. In this paper I study the extent to which commodity prices and factor prices converged across regions between 1820 and 1860. I find very little evidence of antebellum FPC across regions. I further find that commodity prices equalized quite markedly, but that nominal labor prices equalized very little, if at all. Given this result, I go on to discuss two aspects of the antebellum economy that probably helped prevent FPC: differences across regions in endowments and technology. This finding underscores the fact that the FPC theorem does not have unambiguous empirical predictions. How commodity prices feed into factor prices depends crucially on parameters such as endowments and technology.

Comovement in Cities
John Shea

NBER Working Paper No. 5304
October 1995
JEL Nos. E32, R11
Monetary Economics

Recent research has shown that industries that locate together in space also move together over the business cycle, and that this correspondence between spatial and temporal comovement is important to aggregate volatility. This paper asks whether the correspondence is attributable to local common shocks or to local spillovers. I examine interindustry comovements within seven large U.S. cities, and find strong evidence of local spillovers. I estimate that local spillovers explain roughly one-third of manufacturing employment volatility at the city level. Local spillovers do not appear to result from transport costs and locally traded goods.

Complementarities and Comovements
John Shea

NBER Working Paper No. 5305
October 1995
JEL Nos. E32, R12
Monetary Economics

Short-run interindustry comovement may be attributable either to common shocks or to complementarities that propagate shocks across sectors. This paper assesses the importance of input–output linkages, and spillovers from aggregate and local activity to comovement in postwar U.S. manufacturing. I find that input–output linkages and local activity spillovers are important to comovement, while aggregate activity spillovers are not important. I also find that complementarities are important to aggregate volatility, even after I remove observable aggregate shocks from the data. Local spillovers are particularly important, explaining between 15 and 36 percent of the volatility of manufacturing employment.

Generic Entry and the Pricing of Pharmaceuticals
Richard G. Frank and David S. Salkever

NBER Working Paper No. 5306
October 1995
Health Care

During the 1980s the share of prescriptions for generic products sold by retail pharmacies roughly doubled. The price response of brand-name products to generic entry has been a source of controversy, though. In this paper we estimate models of price responses to generic entry in the market for brand-name and generic drugs. We study a sample of 32 drugs that lost patent protection during the early to mid-1980s. Our results provide strong evidence that brand-name prices increase after entry, and are accompanied by large decreases in the price of generic drugs.

Emerging Equity Market Volatility
Geert Bekaert and Campbell R. Harvey

NBER Working Paper No. 5307
October 1995
JEL Nos. F3, G0, G1, C5
Asset Pricing

Returns in emerging capital markets are very different from returns in developed markets. While most previous research has focused on average returns, we analyze the volatility of the returns in emerging equity markets. We characterize the time-series of volatility in emerging markets, and explore the distributional foundations of the variance process. Of particular interest are asymmetries in volatility and the evolution of the variance process after periods of capital market reform. We shed indirect light on the question of capital market integration by exploring the changing influence of world factors on the volatility in emerging markets. Finally, we investigate the cross-section of volatility. We use measures such as asset concentration, market capitalization to GDP, size of the trade sector, cross-sectional volatility of individual securities within each country, turnover, foreign exchange variability, and national credit ratings to characterize why volatility is different across emerging markets.

Politics and the Effectiveness of Foreign Aid

Peter Boone

NBER Working Paper No. 5308
October 1995
JEL Nos. E1, F35, O11
International Finance and Macroeconomics

Critics of foreign aid programs long have argued that poverty reflects government failure. In this paper I analyze the effectiveness of foreign aid programs to gain insights into political regimes in aid-recipient countries. My analytical framework shows how three stylized political/economic regimes, labeled egalitarian, elitist, and laissez-faire, would use foreign aid. I then test reduced-form equations using data on nonmilitary aid flows to 96 countries. I find that models of elitist political regimes best predict the impact of foreign aid. Aid does not significantly increase investment and growth, nor benefit the poor, as measured by improvements in human development indicators, but it does increase the size of government. I also find that the impact of aid does not vary according to whether recipient governments are liberal democratic or highly repressive. But liberal political regimes and democracies, ceteris paribus, have on average 30 percent lower infant mortality than the least free regimes. This may be because of greater empowerment of the poor under liberal regimes, even though the political elite continues to receive the benefits of aid programs. One implication is that short-term aid targeted to support new liberal regimes *may* be a more successful means of reducing poverty than current programs.

Politics and Trade Policy

Elhanan Helpman

NBER Working Paper No. 5309
October 1995
JEL Nos. F13, F15
International Trade and Investment, International Finance and Macroeconomics

First I describe a number of political economy approaches that have been developed to explain trade policies. I present all the approaches in a unified framework that helps to show off the key differences among them. These comparisons revolve around tariff formulas that are predicted by political equilibriums. A typical formula explains cross-sectoral variations in rates of protection as well as differences in average rates of protection across countries. Then I review a set of results that emerge from a new approach to the interaction of international economic relations with domestic politics. Importantly, there are two-way interactions in such systems. They link the formation of trade policies in the international arena with the activities of domestic special interest groups. A framework of this sort is essential for a proper analysis of a host of important problems, such as negotiations about tariff levels or the formation of free trade areas. Recent studies have developed suitable tools for this purpose.

International Cycles

Stephen G. Cecchetti and Anil K Kashyap

NBER Working Paper No. 5310
October 1995
JEL Nos. E23, E32
Monetary Economics

We study 20 years of monthly production data for 11 manufacturing industries in 19 countries. Using the fact that in some countries production virtually shuts down for one summer month, together with the differences in the timing of aggregate cyclical fluctuations, we are able to learn about the cost structure of different industries. Our primary finding is that during a boom year, summer shutdowns are shorter. Rather than increasing production further during the rest of the year, producers reallocate activity from high-output months to low-output months.

We also find that there are important seasonal/cyclical interactions common to all industries within a given country, and that these countries' effects are larger than the pure industry effects. The correlation of the cross-country differences with measures of taxation and labor market structure suggests the possibility that differences in the willingness (and ability) to substitute labor intertemporally are responsible for the variation.

Good News for Value Stocks: Further Evidence on Market Efficiency

Rafael La Porta, Josef Lakonishok, Andrei Shleifer, and Robert W. Vishny

NBER Working Paper No. 5311
October 1995
Assset Pricing

This paper examines the hypothesis that the superior return to so-called value stocks is the result of expectational errors made by investors. We study stock price reactions around earnings announcements for value and glamour stocks over a five-year period after portfolio formation. The announcement returns suggest that a significant portion of the difference in return between value and glamour stocks is attributable to earnings surprises that are systematically more positive for value stocks. The evidence is not consistent with a risk-based explanation for the return differential.

The Forward Discount Anomaly and the Risk Premium: A Survey of Recent Evidence

Charles M. Engel

NBER Working Paper No. 5312
October 1995
JEL No. F3
International Finance and Macroeconomics, Asset Pricing

The unbiasedness of the forward exchange rate is rejected in tests from the current floating exchange rate era. This paper surveys advances in this area since the publication of Hodrick's (1987) survey. It documents that the change in the future exchange rate generally is related negatively to the forward discount. I review properties of the expected forward forecast error. I then discuss the relationship of uncovered interest parity to real interest parity, and the implications of uncovered interest parity for cointegration of various quantities. I also survey the modeling and testing for risk premiums. Included in this area are tests of the consumption CAPM, the latent variable model, and portfolio-balance models of risk premiums. Further, I examine general equilibrium models of the risk premium and explore their empirical implications. The survey does not cover the important areas of learning and peso problems, tests of rational expectations based on survey data, or the models of irrational expectations and speculative bubbles.

Liquidity Models in Open Economies: Theory and Empirical Evidence

Nouriel Roubini and Vittorio U. Grilli

NBER Working Paper No. 5313
October 1995
JEL Nos. E52, F41
International Finance and Macroeconomics

This paper presents an overview of recent theoretical and empirical research on "liquidity models" in open economies: a class of optimizing models in which money has effects on real asset prices and economic activity without the "ad-hoc" assumption of price/wage stickiness. The nonneutrality of money derives from a temporary segmentation between goods and asset markets. After surveying the theoretical literature on liquidity models, we present empirical evidence based on vector autoregression econometric techniques for the seven major industrial countries. This evidence is consistent with the main implications of the liquidity models.

Validating the Conjectural Variation Method: The Sugar Industry, 1890–1914

David Genesove and Wallace P. Mullin

NBER Working Paper No. 5314
October 1995
JEL No. L13
Industrial Organization

The Conjectural Variation (CV) methodology uses the responsiveness of price to cost determinants under differing demand conditions to infer market power and cost. Thus it substitutes demand information for complete cost information. We use the American sugar refining industry at the turn of the century to assess the efficacy of the CV approach. To do so we compare direct measures of marginal cost and price–cost markups with the indirect estimates obtained from the CV method. We find that the CV method performs reasonably well. It yields estimates of industry conduct that are close to the direct measure we derive from full cost information, and robust to the choice of the functional form of demand. The conduct parameter is underestimated, but the deviation is minimal in our context. The CV methodology does a better job of detecting differences in conduct arising from different structural regimes (corresponding to the aftermath of entry), but only when the researcher imposes the (a priori known) restriction of cost stability.

Unemployment Insurance and Household Welfare: Microeconomic Evidence 1980–93

Daniel S. Hamermesh and Daniel T. Slesnick

NBER Working Paper No. 5315
October 1995
JEL Nos. I38, D12
Labor Studies

This study examines the relative economic well-being—as measured by consumption flows that are derived from information on households' spending in the Consumer Expenditure Surveys from 1980–93—of households that receive unemployment insurance (UI) benefits. For each quarter during this period we obtain the per-capita and equivalence-scale adjusted economic welfare of the two types of households. Adjusting for differences in the households' characteristics, we find: 1) the average UI recipient household during this period had a level of economic well-being that was on average between 3 and 8 percent below that of otherwise identical households (depending on the welfare measure used); 2) during a substantial part of this time the economic well-being of households that received UI benefits was at least that of other households; and 3) there is no cyclical variation in the relative well-being of UI recipient households compared to others. These findings imply that during the 1980s and early 1990s, states' UI programs did a satisfactory job of maintaining the well-being of UI recipients. Emergency programs enacted during recessions raised potential duration sufficiently to prevent the economic position of the average UI recipient from deteriorating.

The Implicit Taxes from College Financial Aid

Andrew W. Dick and Aaron S. Edlin

NBER Working Paper No. 5316
October 1995
Public Economics

Families who heed the advice of "experts" and save for their children's college education typically receive less financial aid. The variation in the net price of college functions as a large tax on savings. College financial aid also functions as an income tax. This paper estimates the size and determinants of these income and asset taxes. We find that the marginal income tax typically ranges from 2 percent to 16 percent and the marginal asset levy from somewhat under 10 percent to as high as 25 percent. If a typical family chooses to accumulate $100,000 in assets rather than consuming these resources, it loses financial aid worth $10,000–$20,000.

Growth Effects of Income and Consumption Taxes: Positive and Normative Analysis

Nouriel Roubini and Gian Maria Milesi-Ferretti

NBER Working Paper No. 5317
October 1995
JEL Nos. E62, O41
International Finance and Macroeconomics, Public Economics

We examine the effects of income and consumption taxation in the context of models in which growth is driven by the accumulation of human and physical capital. We discuss the different channels through which these taxes affect economic growth, and show that in general the taxation of factor incomes (human and physical capital) reduces growth. The effects of consumption taxation on growth depend crucially on the elasticity of labor supply, and therefore on the specification of the leisure activity. We also derive implications for the optimal intertemporal choice of tax instruments.

Collapsing Exchange Rate Regimes: Another Linear Example

Robert P. Flood, Peter M. Garber, and Charles Kramer

NBER Working Paper No. 5318
October 1995
JEL Nos. F30, F33
International Finance and Macroeconomics

In the literature on speculative attacks on a fixed exchange rate, it usually is assumed that the monetary authority responsible for fixing the exchange rate reacts passively to the monetary disruption caused by the attack. This assumption is grossly at odds with actual experience in which monetary-base implications of the attacks usually are sterilized. Such sterilization renders the standard monetary-approach attack model unable to provide intellectual guidance for recent attack episodes. In this paper we describe the problems with the standard model and develop a version of the portfolio-balance exchange rate model that allows us to study episodes with sterilization. Sterilized attacks may be regarded as a laboratory test of the monetary versus the portfolo-balance model of exchange rates. The monetary model fails the test. These issues are motivated by reference to the December 1994 collapse of the Mexican peso.

The Impact of Price, Availability, and Alcohol Control Policies on Binge Drinking in College

Frank J. Chaloupka and Henry Wechsler

NBER Working Paper No. 5319
October 1995
JEL No. I1
Health Economics

We estimate the effects of beer

prices, the availability of alcohol, and policies related to driving under the influence (of alcohol) on drinking and binge drinking among youths and young adults. We use data from a nationally representative survey of students in U.S. colleges and universities. Our estimates indicate that the drinking practices of college students are sensitive to the price of beer, with an average estimated price elasticity of drinking of –0.066 and an average estimated price elasticity of binge drinking of –0.145. However, when dividing the sample by gender, we find that the effects of prices on drinking are limited to young women. In addition, we find a significant negative relationship between the strength of policies related to drinking and driving among youths and young adults and drinking by college students. However, our results indicate that many elements of campus life (including participation in a fraternity or sorority, living on campus, and the ready availability of alcoholic beverages) are among the most important determinants of drinking and binge drinking among college students.

Social Networks, Learning, and Flexibility: Sourcing Scientific Knowledge in New Biotechnology Firms

Julia Porter Liebeskind, Amalya Lumerman Oliver, Lynne G. Zucker, and Marilynn B. Brewer

NBER Working Paper No. 5320
October 1995
JEL No. O31
Productivity

We examine how two highly successful new biotechnology firms (NBFs) source their most critical input: scientific knowledge. We find that scientists at the two NBFs enter into large numbers of collaborative research efforts with scientists at other organizations, especially at universities. Formal market contracts rarely are used to govern these exchanges of scientific knowledge. Our findings suggest that the use of boundary-spanning social networks by the two NBFs increases both their learning and their flexibility in ways that would not be possible within a self-contained hierarchical organization.

Research and Productivity

Boyan Jovanovic and Yaw Nyarko

NBER Working Paper No. 5321
October 1995
JEL Nos. O31, O33
Productivity

We model research as a signal on an unknown parameter of a technology. We distinguish applied from basic research, and show that firms in the same industry optimally can choose different research portfolios. Basic research can seem to have a higher rate of return than applied research, even though it really doesn't: essentially, firms on a "fast-track" upgrading policy opt for basic research, but fast- and slow-track upgrading policies can coexist in a long-run equilibrium.

We also derive the lag structure for how R and D affects the firm's stock of knowledge. To a first approximation, the lags decay geometrically (as typically is assumed in practice) but the rate of decay is endogenous, and depends on how fast the firm is upgrading its technology.

The Political Economy of Mexico's Entry to NAFTA

Aaron Tornell and Gerardo Esquivel

NBER Working Paper No. 5322
October 1995
International Trade and Investment, International Finance and Macroeconomics

In this paper, we derive three lessons from Mexico's experience. First, deep reforms such as trade liberalization are not likely to happen by government decree. Instead, they usually come about when the unanimous blocking of reform by powerful elites breaks down. In the case of Mexico, this happened during a fiscal crisis, when some groups tried to displace other groups in order to capture a greater share of fiscal revenue. Second, in the presence of entrenched elites, the sustainability of reform depends on the existence of new groups that benefit from the new status quo and have enough power to defend it. Thus, the speed of successful reform is determined by the speed with which new groups are consolidated. Initially, Mexico limited radical liberalization to the manufacturing sector. The government only recently has begun to undertake serious liberalization in the services and agriculture sectors. The third lesson we take from Mexico is that the importance of formal agreements such as NAFTA lies not so much in the ability of these agreements to reduce average import tariffs among their parties and improve their terms of trade vis à vis the rest of the world, as claimed by the optimal tariff literature, but in that they serve as commitment devices to force reforms to continue.

Exchange Rate Variability and the Riskiness of U.S. Multinational Firms: Evidence from the Breakdown

Eli Bartov, Gordon M. Bodnar, and Aditya Kaul

NBER Working Paper No. 5323
October 1995
JEL Nos. F23, F31
Asset Pricing, International Finance and Macroeconomics

This study assesses the impact of exchange rate variability on the riskiness of U.S. multinational firms by examining the relationship between exchange rate variability and stock return volatility, and by decomposing this relationship into components of systematic and diversifiable risk. Focusing on two periods around the 1973 switch from fixed to floating exchange rates, we find a significant increase in the volatility of the monthly stock returns of U.S. multinationals corresponding to the period of increased exchange rate variability. This increase in stock return volatility is also significant relative to the increase in stock return volatility for firms in three control samples. Using a single-factor market model, we show that this increase in total volatility led to a significant increase in market risk (beta) for the multinational firms relative to the control samples between the two periods. Collectively, these results suggest that investors perceived the increase in exchange rate variability after 1973 to be associated with an increase in the riskiness of cash flows of multinational firms that required compensation in terms of higher expected returns.

Bilateral Negotiations and Multilateral Trade: The Case of Taiwan–U.S. Trade Talks

Tain-Jy Chen and Meng-chun Liu

NBER Working Paper No. 5324
October 1995
JEL No. F13
International Trade and Investment

This paper reviews the history of bilateral trade negotiations between Taiwan and the United States. The question posed at the outset is: does bilateralism enhance or jeopardize multilateralism? The U.S.–Taiwan experience seems to suggest a grossly negative answer. Bilateral negotiations for market opening with the threat of unilateral trade sanctions (such as Section 301 action) tend to encourage trade preferences, and U.S. negotiators are inclined to accept such preferential arrangements in areas where U.S. domestic interests are homogeneous and concentrated. Even in the case of tariff negotiations in which any tariff concessions made by Taiwan are extended to other trading partners on a most favored nation basis, bilateralism does not necessarily enhance multilateral principles. The scope of tariff concessions made by Taiwan shows a strong bias in favor of the sectors in which the United States has a comparative advantage in Taiwan's market and the sectors in which U.S. domestic industries exhibit monopoly power. Meanwhile, U.S. commitments to GATT strengthen its position in bilateral negotiations and help persuade Taiwan, which is not a member of GATT, to make similar concessions.

EU, NAFTA, and Asian Responses: A Perspective from the Calculus of Participation

Junichi Goto and Koichi Hamada

NBER Working Paper No. 5325
October 1995
JEL Nos. F12, F13, F15
International Trade and Investmant

How should the Asian countries cope with the formation of the EU and NAFTA? Is it desirable for them to form their own trading area? And, if so, is it better to have a closed one, such as the EAEC, or a more open one, such as the APEC?

Relying on public economics and the calculus of participation, combined with the Dixit–Stiglitz–Krugman framework, we find that: 1) the development of the EAEC by the leadership of Malaysia would be a natural response of Asian countries against two big blocs in the world, EU and NAFTA; 2) it is natural for the United States to discourage this move because the formation of an economic bloc in Asia will have a negative economic impact on the non-Asian countries; 3) it is natural for the United States to propose an opposing coalition such as the APEC to nullify the possible economic impact of the EAEC; but 4) perhaps the APEC will be a good roundabout way toward international free trade.

Inflation and Economic Growth

Robert J. Barro

NBER Working Paper No. 5326
October 1995
JEL Nos. O40, E31
Economic Fluctuations, Growth, Monetary Economics

I use data for around 100 countries from 1960 to 1990 to assess the effects of inflation on economic performance. If a number of country characteristics are held constant, then the regression results indicate that the effects of an increase in average inflation of 10 percentage points per year are a reduction in the growth rate of real per capita GDP by 0.2–0.3 percentage points per year and a decrease in the ratio of investment-to-GDP of 0.4–0.6 percentage points. Since the statistical procedures use plausible instruments for inflation, there is some reason to believe that these relationships reflect causal influences from inflation to growth and investment. However, statistically significant results emerge only when high-inflation experiences are included in the sample. Although the adverse influence of inflation on growth looks small, the long-term effects on standards of living are substantial. For example, a shift in monetary policy that raises the long-term average inflation rate by 10 percentage points per year is estimated to lower the level of real GDP after 30 years by 4–7 percent, more than enough to justify a strong interest in price stability.

Optimal Debt Management
Robert J. Barro
NBER Working Paper No. 5327
October 1995
JEL Nos. E62, H30
Economic Fluctuations, Public Economics, Growth

Optimal debt management can be thought of in three stages. First, if taxes are lump sum and the other conditions for Ricardian equivalence hold, then the division of government financing between debt and taxes is irrelevant, and the whole level of public debt is indeterminate from an optimal-tax standpoint. Second, if taxes are distorting, then the timing of taxes generally will matter; for example, it may be desirable to smooth tax rates over time. This consideration makes determinate the levels of debt at various dates, but does not pin down the composition of the debt, say by maturity. Finally, if there is uncertainty about real interest rates, levels of public outlay, GDP, and so on, then the relationship of tax rates to states of nature becomes important. In some cases, optimal taxation dictates the smoothing of tax rates over states of nature, and this element may pin down the composition of the debt. For example, the maturity structure can be designed to insulate the government's financing costs from shifts in real interest rates.

This paper studies dynamic optimal taxation in an equilibrium model that yields a form of tax smoothing as a basis for debt management. The main analysis uses a tractable form of the one-sector stochastic growth model. The type of taxation that yields the clearest results on tax smoothing is a proportional levy on consumption. In a simple benchmark case, optimal debt management entails the issue of indexed consols. More generally, payouts on debt also would be contingent on aggregate consumption and the level of government spending.

The Political Economy of State-Provided Health Insurance in the Progressive Era: Evidence from California
Dora L. Costa
NBER Working Paper No. 5328
October 1995
JEL Nos. I11, I18, N12
Development of the American Economy

I investigate why the United States did not adopt European-style health insurance in the 1910s by examining voting determinants on the 1918 referendum on state-provided health insurance in California. I find that although the persuasiveness of interest groups, especially doctors, was an important determinant of the 1918 vote, interest groups alone could not explain the resounding defeat of state-provided health insurance. Voters were unwilling to pass a costly measure with an unpredictable outcome, I find.

How Mexico Lost Its Foreign Exchange Reserves
Andrew Atkeson and José-Víctor Ríos-Rull
NBER Working Paper No. 5329
October 1995
JEL Nos. F32, F34, F41
International Finance and Macroeconomics

In standard models of the balance of payments, crises occur when investors begin to doubt the credibility of the government's commitment to its exchange rate policy. In this paper, we develop an alternative model in which balance-of-payments crises occur even if the credibility of government fiscal, monetary, and exchange rate policies is never in doubt. In this alternative model, international lending is constrained by the risk of repudiation. Balance-of-payments crises occur when the government and citizens of a country hit their international borrowing constraints. Our model is broadly consistent with events in Mexico from 1987–95. More generally, our model suggests that countries that undertake sweeping macroeconomic and structural reforms should expect to face a balance-of-payments crisis when they exhaust their access to international capital inflows.

Privatization of Social Security: How It Works and Why It Matters
Laurence J. Kotlikoff
NBER Working Paper No. 5330
October 1995
JEL No. H0
Public Economics

This paper uses the Auerbach–Kotlikoff dynamic life-cycle model (AK model) to examine the macroeconomic and efficiency effects of privatizing Social Security. It also uses a simple privatization proposal, the Personal Security System, as a framework for discussing a number of other issues associated with the privatization of Social Security, including transition rules and changes in the overall degree of progressivity.

According to the AK model, privatizing Social Security can generate very major long-run increases in output and living standards. These gains come largely, but not exclusively, at the expense of existing generations. Indeed, the pure efficiency gains from privatization can be substantial. Efficiency gains here refers to the welfare improvement available to future generations after existing generations have been compensated fully for their losses from privatization. The precise size of the efficiency gain depends on the existing tax structure, the linkage between benefits and taxes under the existing Social Security system, and the choice of the tax instrument used to finance benefits during the transition.

When the initial tax structure features a progressivekincome tax, when the existing system's benefit–tax linkage is low, when consumption taxation is used to finance Social Security benefits during the transition, and when existing generations are compensated fully for their privatization losses, there is a 4.5 percent simulated welfare gain to future generations from privatization. But if these circumstances don't hold, the efficiency gains from privatization are likely to be smaller, possibly even negative. For example, when the initial tax structure is a proportional income tax, when benefit–tax linkage is perceived to be dollar for dollar, when the income tax rate is raised to finance Social Security benefits during the privatization transition, and when current generations are fully compensated, there is a 3.1 percent welfare loss to future generations.

The illustrative Personal Security System shows that there are simple ways to privatize the retirement portion of the U.S. Social Security system and to credit workers for their past Social Security contributions. It also suggests that Social Security's privatization could provide more survivors' protection than the current system, as well as eliminating much of the current system's seemingly capricious redistribution between two-earner and single-earner couples. But the proposal's analysis also suggests that these benefits from privatization must be set against a possible reduction in progressivity and a likely reduction in the amount of longevity insurance available to the elderly through annuities.

The Effect of Measured School Inputs on Academic Achievement: Evidence from the 1920s, 1930s, and 1940s Birth Cohorts

Susanna Loeb and John Bound

NBER Working Paper No. 5331
November 1995
JEL Nos. I20, J31
Labor Studies

This study uses data from the National Opinion Research Center's General Social Surveys to explore the effects of measurable school characteristics on student achievement. It differs from many other studies by its use of *aggregate* data on *older* cohorts, usually associated with research on the influence of school inputs on earnings. Studies on earnings have tended to find substantial effects, while much of the research on achievement using contemporary, cross-sectional data has not. However, we find substantively large effects, similar in size to those found in many earnings-focused studies. In this way, our results point to the importance of aggregation and cohort effects in modeling the relationship between school inputs and student outcomes. In particular, the level of data aggregation appears important, bringing into question causal interpretations of the results of studies using aggregate data to assess school input effects

Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience

Francesco Giavazzi and Marco Pagano

NBER Working Paper No. 5332
November 1995
International Finance and Macroeconomics

In earlier work we documented two episodes in which a sharp fiscal consolidation was associated with a surprisingly large expansion in private domestic demand. In this paper we draw on further evidence to investigate if and when changes in fiscal policy can have such non-Keynesian effects. In the first part of the paper, we analyze cross-country data for 19 OECD countries. In the second part, we concentrate on the Swedish fiscal expansion of the early 1990s.

The cross-country evidence on private consumption confirms that changes in fiscal policy—both contractions and expansions—can have non-Keynesian effects if they are sufficiently *large* and *persistent*. It also suggests that these effects can result not only from changes in public consumption, but also to some extent *from changes in taxes and transfers*. This latter result is also consistent with the Swedish experience, in which a decrease in net taxes (with almost no change in public consumption) was associated with a dramatic fall in private domestic demand.

Our evidence and that of other studies concur that during the Swedish fiscal expansion of the early 1990s, a large negative error appears in the consumption function. There is less consensus about how this error should be interpreted, but it is clear that the most obvious candidates (wealth effects and aftertax real interest rate effects) are not sufficient to explain it. This error may reflect a large downward revision of permanent disposable income, which affected the consumption of Swedish households over and beyond the negative effects of the drop in real asset prices. We suggest that this revision in permanent income may have been triggered, at least in part, by the fiscal expansion of the early 1990s.

The Effects of Human Resource Management Practices on Productivity

Casey Ichniowski, Kathryn Shaw, and Giovanna Prennushi

NBER Working Paper No. 5333
November 1995
JEL Nos. J4, J5, D2
Labor Studies, Productivity

Increasingly, firms are considering the adoption of new work practices, such as problem-solving teams, enhanced communication with workers, employment security, flexibility in job assignments, training workers for multiple jobs, and greater reliance on incentive pay. This paper provides empirical answers to the question: do these human resource management practices improve worker productivity?

For this study, we constructed our own database through personal site visits to 26 steel plants that used one specific steelmaking process. We collected longitudinal data with precise measures on productivity, work practices, and the technology in these production lines. Our empirical results consistently support this conclusion: the adoption of a coherent system of new work practices—including work teams, flexible job assignments, employment security, training in multiple jobs, and extensive reliance on incentive pay—produces substantially higher levels of productivity than do more "traditional" approaches involving narrow job definitions, strict work rules, and hourly pay with close supervision. In contrast, adopting individual work practice innovations in isolation has no effect on productivity. We interpret this evidence as support for recent theoretical models that stress the importance of complementarities among a firm's work practices.

Hiring Risky Workers

Edward P. Lazear

NBER Working Paper No. 5334
November 1995
JEL Nos. J00, J6, J41
Labor Studies

In finance and other literature it has long been recognized that variance provides option value. The same point extends to the labor market. Firms like variance in new employees because they can keep the good workers and terminate the bad ones. But market wages must adjust to make the marginal firm indifferent between high- and low-variance workers.

We explore the market equilibrium for new, risky workers to determine how workers and firms line up on the various sides of the market. Firms in growing industries prefer young, high-variance workers. Growing industries are characterized by high turnover rates. In order for risky workers to provide option value, the initial employer must have some advantage over other firms. Private information or mobility costs can provide that advantage. It is also required that the risk have a firm-specific component. General variations in ability provide no option value to an initial hirer.

Social Insurance, Incentives, and Risktaking

Hans-Werner Sinn

NBER Working Paper No. 5335
November 1995
JEL No. H2
Public Economics

From the perspective of parents, redistributive taxation can be seen as social insurance for their children, for which no private alternative exists. Because private insurance comes too late during a person's life, it cannot cover the same risks as social insurance. Empirically, 85 percent of social insurance covers risks for which no private insurance would have been available. Redistributive taxation can enhance efficiency, because it creates safety and because it stimulates income-generating risktaking. However, it also brings about detrimental moral hazard effects. Both the enhancement of risktaking and the moral hazard effects tend to increase inequality in the economy and, under constant returns to risktaking, this increase is likely to be strong enough even to make the net-of-tax income distribution more unequal. Optimal redistributive taxation either will imply that the pie becomes bigger when there is less inequality in pretax incomes or that more redistribution creates more posttax inequality. The welfare state will encounter severe risks when free migration of people, goods, and factors of production becomes possible. Basing redistributive taxation on a nationality principle may help to overcome some of these risks.

Procyclical Productivity: Increasing Returns or Cyclical Utilization?

Susanto Basu

NBER Working Paper No. 5336
November 1995
JEL No. E2
Economic Fluctuations, Monetary Economics

It has long been argued that cyclical fluctuations in labor and capital utilization and the presence of overhead labor and capital are important for explaining procyclical productivity. Here I present two simple and direct tests of these hypotheses, and a way of measuring the relative importance of these two explanations. The intuition behind the paper is that materials input is likely to be measured with less cyclical error than labor and capital input, and materials are likely to be used in strict proportion to value added. In that case, materials growth provides a good measure of the unobserved changes in capital and labor input. Using this measure, I find that the true growth of variable labor and capital inputs is, on average, almost twice the measured change in the capital stock or labor hours. More than half of that is caused by the presence of overhead inputs in production; the rest is attributable to cyclical factor utilization.

Historical Factors in Long-Run Growth

Fertility and Marriage in New York State in the Era of the Civil War

Michael R. Haines and Avery M. Guest

NBER Historical Paper No. 70
July 1995

This paper analyzes a 5 percent systematic sample of households from the manuscripts of the New York State Census of 1865 for seven counties (Allegany, Dutchess, Montgomery, Rensselaer, Steuben, Tompkins, and Warren). The sample was selected to provide a variety of locations, settlement dates, and types of agricultural economy, and includes two substantial urban areas (the cities of Troy and Poughkeepsie). This census was the first in the United States to ask a question about "children ever born." These parity data, along with own-children estimates of age-specific overall and marital fertility rates, are used to examine the relationship between fertility and rural–urban residence, occupation, ethnicity, literacy, and location within the state. Singulate mean ages at first marriage and other measures of nuptiality also are estimated. The parity data provide direct evidence of fertility decline in the United States during the first half of the 19th century. Township data are added to the individual records to provide contextual variables. The issue of ideational versus socioeconomic and structural factors in fertility is discussed.

A New Sample of Americans Linked from the 1850 Public Use Micro Sample of the Federal Census of Population to the 1860 Federal Census Manuscript Schedules

Joseph P. Ferrie

NBER Historical Paper No. 71
August 1995
JEL Nos. N01, N31

Although the geographic, occupational, and financial mobility of average Americans were important aspects of economic development in the nineteenth-century United States, the extent and correlates of this economic mobility have remained open to debate in the absence of individual-level longitudinal data. This essay describes a new sample of 4837 individuals linked from the 1850 Public Use Micro Sample of the Federal Census of Population to the 1860 Federal Census Manuscript Schedules, using the new national 1860 Federal Census Index. The linked sample provides information on occupation, wealth, family structure, and location in both 1850 and 1860. I describe in detail the construction of the sample and test its representativeness, and I give examples of its potential uses.

The Farm–Nonfarm Wage Gap in the Antebellum United States: Evidence from the 1850 and 1860 Censuses of Social Statistics

Robert A. Margo

NBER Historical Paper No. 72
August 1995
JEL No. N31

Sectoral wage gaps for workers of comparable skill are central to issues in economic development and economic history. This paper presents new archival evidence on the farm–nonfarm wage gap for the United States just prior to the American Civil War. Measured at the level of local labor markets, the wage gaps are small and not very persistent over time. Aggregated to reflect the geographic distribution of farm and nonfarm labor, the gaps are larger than previously thought. I also show that investment in manufacturing capital between 1850 and 1860 responded to labor market inefficiencies indicated by the gaps: counties with relatively low farm wages experienced above-average investment.

Myth of the Industrial Scrap Heap: A Revisionist View of Turn-of-the-Century American Retirement

Susan B. Carter and Richard Sutch

NBER Historical Paper No. 73
October 1995

Using the census survival method to calculate net flows across employment states between 1900 and 1910, we find that approximately one-fifth of all men who reached the age of 55 eventually retired before their death. Many of these retirees appear to have planned their withdrawal from paid employment by accumulating assets, becoming self-employed, and then liquidating their assets to provide a stream of income to finance consumption in old age. This "modern" retirement behavior, we argue, has important implications for the economic history of capital and labor markets, saving and investment, insurance and pensions, and the family economy.

Fixing the Facts: Editing of the 1880 U.S. Census of Occupations with Implications for Long-Term Trends and the Sociology of Official Statistics

Susan B. Carter and Richard Sutch

NBER Historical Paper No. 74
October 1995

We argue that the enumerators' occupational returns from the important Census of 1880 were edited heavily prior to publication. The effect was to substantially reduce the number of individuals reported with an occupation. For youthful and older males and all women, the editing was so substantial as to qualitatively affect the apparent trend in labor force participation for these groups over time. The stylized facts regarding labor market dynamics during the period of American industrialization and the historical stories constructed around them now will need to be reexamined. We contend that the editing was authorized secretly by Francis Amasa Walker, superintendent of the *Tenth Census of 1880* and one of the most prominent and decorated economists, statisticians, and public servants in America at that time. While other scholars have identified potential sources of bias in Census figures, no one has heretofore suggested that the official statistics of the United States were altered covertly to present a picture different from information collected by Census enumerators. If we are correct, the sociology of official nineteenth-century American statistics will require rethinking.

Percentiles of Modern Height Standards for Use in Historical Research

Richard H. Steckel

NBER Historical Paper No. 75
October 1995

Percentiles of modern height standards are useful in historical research because children differ systematically in height by age, and there are differences in growth potential by gender and perhaps across some ethnic groups. Modern height standards are needed to make relative comparisons of nutritional status in these circumstances. The standards also are used to assess progress or deprivation against a level that we know is attainable under good environmental circumstances. Historical researchers who need modern height standards encounter several problems, including the choice of standards, manipulation of those standards to meet the requirements of historical data, and calculation of percentiles. After discussing criteria used in selecting standards, which lead to the choice of NCHS heights as a reference, this paper gives percentiles calculated in line with the requirements of historical data. Results are stated in centimeters and inches, and by age at last birthday and age at nearest birthday.

Technical Papers

One Day in June 1993: A Study of the Working of Reuters 2000-2 Electronic Foreign Exchange Trading System

Charles Goodhart, Takatoshi Ito, and Richard Payne

NBER Technical Paper No. 179
April 1995
JEL Nos. F3, G2
Asset Pricing, International Finance and Macroeconomics

This paper uses foreign exchange data (bid, ask, and transaction prices and quantities) collected from the electronic broking system, Reuters D2000-2, on June 16, 1993. We compare the bid and ask quotes, which are "firm" in this dataset, with the Reuters FXFX page, which reports only indicative bid and ask prices. The samples we have are small: only seven hours. Still, we find that although the bid–ask mean of indicative quotes is similar to that of "firm" quotes, the behavior of the bid–ask spread and the frequency of quote entry are quite different in the two types of quotes. The bid–ask spreads in the broking system vary much more with time and depend on the frequency of trade, while the indicative bid–ask spreads tend to cluster at round numbers.

A la Recherche des Moments Perdus: Covariance Models for Unbalanced Panels with Endogenous Death

John M. Abowd, Bruno Crépon, Francis Kramarz, and Alain Trognon

NBER Technical Paper No. 180
May 1995
JEL Nos. C33, J0
Labor Studies, Productivity

We develop a model for decomposing the covariance structure of panel data on firms into one part caused by permanent heterogeneity, one part caused by differential histories with unknown ages, and one part caused by the evolution of economic shocks to the firm. Our model allows for the endogenous death of firms, and correctly handles the problems arising from the estimation of this death process. We implement this model on an unbalanced longitudinal sample of French firms that have both known and unknown ages and histories. For firms with unknown birthdates, we find, the structural autocorrelation in employment, compensation, and capital is dominated by the part caused by initial heterogeneity and random growth rates. Serial correlation in the periodic shocks is less important. For these firms, profitability, value added, and indebtedness have processes in which the heterogeneity components are less important. Firms with known birthdates and histories (which are younger than the censored firms) have autocorrelation structures dominated by the heterogeneity.

Conditioning on the Probability of Selection to Control Selection Bias

Joshua D. Angrist

NBER Technical Paper No. 181
June 1995
JEL Nos. C24, J31
Labor Studies

Problems of sample selection arise in the analysis of both experimental and nonexperimental data. In clinical trials to evaluate the impact of an intervention on health and mortality, treatment assignment is typically nonrandom in a sample of survivors, even if the original assignment is random. Similarly, randomized training interventions, such as National Supported Work, are not necessarily assigned randomly in the sample of working men. A nonexperimental version of this problem involves the use of instrumental variables (IV) to estimate behavioral relationships. A sample selection rule that is related to the instruments can induce correlation between the instruments and unobserved outcomes, possibly invalidating the use of conventional IV techniques in the selected sample. This paper shows that conditioning on the probability of selection given the instruments can provide a solution to the selection problem as long as the relationship between instruments and selection status satisfies a simple monotonicity condition. A latent index structure is not required for this result, which is motivated as an extension of earlier work on the propensity score. I illustrate the conditioning approach to selection problems using IV techniques to estimate the returns to schooling in a sample with positive earnings.

Refining Estimates of Marital Status Differences in Mortality at Older Ages

Sanders Korenman, Noreen Goldman, and Haishan Fu

NBER Technical Paper No. 182
July 1995
JEL Nos. I12, J12, J14
Aging

The main objective of this analysis is to demonstrate that some of the limitations that have characterized recent studies of the relationship between marital status and health outcomes may result in biased estimates of marital status differences in mortality among the elderly. Our secondary goal is to evaluate the evidence supporting the excess risks of mortality associated with widowhood, once we are able to eliminate or mitigate many of the limitations that affected other studies.

Our results, based on the 1984–90 Longitudinal Study of Aging, demonstrate that the estimated effects of marital status in logit and hazard models of survival are very sensitive to whether and how information on marital status is updated after the baseline interview. Refined measures of marital status that prospectively capture transitions from being married to widowhood result in substantially larger estimates of the relative risk of dying in the early stages of widowhood (bereavement).

Another Heteroskedasticity and Autocorrelation Consistent Covariance Matrix Estimator

Kenneth D. West

NBER Technical Paper No. 183
July 1995
Asset Pricing

I propose and evaluate a $\sqrt{T}$ consistent estimator of a heteroskedasticity and autocorrelation consistent covariance matrix estimator. In the relevant applications the regression disturbance follows a moving average process of known order. In a system of ℓ equations, this "MA-ℓ" estimator entails estimation of the moving average coefficients of an ℓ–dimensional vector. Simulations indicate that the MA-ℓ estimator's finite sample performance is better than that of the estimators of Andrews and Monahan (1992) and Newey and West (1994) when cross-products of instruments and disturbances are sharply negatively autocorrelated; otherwise they are comparable or slightly worse.

Randomization as an Instrumental Variable

James J. Heckman

NBER Technical Paper No. 184
September 1995
JEL Nos. C13, C93
Labor Studies

This paper discusses how randomized social experiments operate as an instrumental variable. For two types of randomization schemes, the fundamental experimental estimation equations are derived from the principle that experiments equate bias in control and experimental samples. Using conventional econometric representations, I derive the orthogonality conditions for the fundamental estimation equations. Randomization is a multiple instrumental variable, in the sense that one randomization defines the parameter of interest expressed as a function of multiple endogenous variables in the conventional usage of that term. It orthogonalizes the treatment variable simultaneously with respect to the other regressors in the model and the disturbance term for the conditional population. However, conventional "structural" parameters in general are not identified by the two types of randomization schemes used widely in practice.

Instrumental Variables: A Cautionary Tale

James J. Heckman

NBER Technical Paper No. 185
September 1995
JEL Nos. C14, C31, C35
Labor Studies

This paper considers the use of instrumental variables to estimate the mean effect of treatment on the treated. It reviews previous work on this topic by Heckman and Robb (1985, 1986) and demonstrates that unless the effect of treatment is the same for everyone (conditional on observables), or the treatment effects are variable but the person-specific component of the variability that cannot be forecast by observables does not determine participation in the program, widely used instrumental variable methods do not produce consistent estimators of the parameter of interest. Neither assumption is very palatable. The first assumes a homogeneity that is implausible. The second assumes either very rich data available to the econometrician, or that the persons being studied either do not have better information than the econometrician or do not use it. Instrumental variable methods do not provide a general solution to the evaluation problem.

Information-Theoretic Approaches to Inference in Moment Condition Models

Guido W. Imbens, Phillip Johnson, and Richard H. Spady

NBER Technical Paper No. 186
October 1995
Labor Studies

The recent papers of Back and Brown (1990), Imbens (1993), and Qin and Lawless (1994) develop one-step efficient GMM estimation. These papers emphasize methods that correspond to Owen's (1988) empirical likelihood to reweight the data so that the reweighted sample obeys all the moment restrictions at the parameter estimates. In this paper, we consider an alternative KLIC-motivated weighting and show how it and similar discrete reweightings define a class of unconstrained optimization problems, which includes GMM as a special case. Such KLIC-motivated reweightings introduce

M auxiliary "tilting" parameters, where *M* is the number of moments; parameter and overidentification hypotheses can be recast in terms of these tilting parameters. Such tests, when conditioned appropriately on the estimates of the original parameters, are often startlingly more effective than their conventional counterparts. This is apparently because of the local ancillarity of the original parameters for the tilting parameters.

Selection Bias Adjustment in Treatment-Effect Models as a Method of Aggregation

Robert A. Moffitt

NBER Technical Paper No. 187
October 1995
JEL No. C3
Public Economics

This paper aims to interpret estimation of the conventional treatment-effect selection-bias model in econometrics as a method of aggregation, and to draw the implications of this interpretation. In addition, the paper notes the connection between this interpretation and an older style of analysis using grouped data, and illustrates the aggregation analogy with examples from the literature. The method of instrumental variables is the estimation technique used to illustrate the points.

A CES Indirect Production Function

Boyan Jovanovic

NBER Technical Paper No. 188
October 1995
JEL No. O31
Productivity

This paper derives an indirect production function that is, in a special case, of a constant elasticity of substitution (CES) form. This is not a contribution to the theory of aggregation generally. Instead it is a microfoundation for a specific but popular production function—the CES—that helps us express the important concept of the elasticity of substitution in terms of more primitive, and more intuitive concepts of the returns to scale. The paper presents a simple lemma, and then shows that several and diverse applications have a common logical structure: the production function often used in growth theory, the utility function when there is household production, human capital theory, and the concept of the aggregate technology shock.

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