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Monetary Economics

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The subject matter of monetary economics encompasses a large part of macroeconomics. Most obviously, monetary economics is concerned with the conduct, effects, institutions, and history of monetary policy. But it extends far beyond that. The sources of aggregate fluctuations, the channels through which changes in monetary policy and other developments are transmitted to the macroeconomy, and households' and firms' decisions about consumption, investment, prices, and other variables that are critical to aggregate fluctuations are all important subjects in monetary economics. Indeed, the unofficial working definition of "monetary economics" that is used by the NBER's Program in Monetary Economics is "anything that central bankers should be interested in." Examples of recent work in the program that is not explicitly about monetary policy but that falls squarely within the program's mandate include research by James H. Stock and Mark W. Watson on forecasting inflation (12324); research by Christopher House and Matthew D. Shapiro on the effects of temporary investment incentives (12514); research by Michael W. Elsby on downward wage rigidity (12611); research by Andrew Ang, Monika Piazzesi, and Min Wei on using interest rates to forecast GDP growth (10672); research by Francis E. Warnock and Veronica C. Warnock on the impact of purchases of U.S. government bonds by foreign central banks on U.S. interest rates (12560); and much more.

Researchers in the NBER's Program in Monetary Economics contribute to our understanding of monetary economics by conducting empirical and theoretical studies of a wide range of subjects within the

We are moving from a quarterly, seasonal system to a numbered system for the *NBER Reporter*, with the eventual goal of producing six issues per year. This is the second issue of 2007 under the new numbering system: 2007 Number 2.

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broad field of monetary economics. These studies are issued as NBER Working Papers, and presented and discussed at regular meetings of the program and at special NBER conferences devoted to particular subjects related to monetary policy. The studies are subsequently published in NBER volumes and in academic journals.

Although the greatest long-run influence of the members of the Monetary Economics program is surely through their research, they also have a very tangible, immediate influence through an entirely different channel: former members of the program hold key positions at central banks throughout the world. Most obviously, former NBER Research Associate (and former Director of the Program in Monetary Economics) Ben S. Bernanke took office as the eighth Chair of the Board of Governors of the Federal Reserve System in February 2006. In addition, program member (on leave) Mervyn A. King is the Governor of the Bank of England; program member Stanley Fischer is the Governor of the Bank of Israel; program member (on leave) Janet Yellen serves as President of the Federal Reserve Bank of San Francisco; program member (on leave) Frederic S. Mishkin is a member of the Federal Reserve Board of Governors; program member Lars E.O. Svensson is a Deputy Governor of the Riksbank (Sweden's central bank); and program member David G. Blanchflower is a member of the Monetary Policy Committee of the Bank of England.

Program members also interact frequently with monetary policymakers. These interactions serve to keep program members abreast of developments in monetary policymaking, and to allow policymakers to convey to NBER researchers their views about what issues are currently important to them. Traditionally, one session at the program's meeting during the NBER's Summer Institute is devoted to a discussion with a policymaker. Policymakers who have met with the group in recent years include Ben Bernanke (both in 2003, when he was a member of the Board of Governors, and in 2007, when he was chair), Stanley Fischer, Donald Kohn (when he was a member of the Board of Governors; he is currently its vice-chair), N. Gregory Mankiw (when he was chair of the President's Council of Economic Advisers), and Janet Yellen.

In this report, we provide an overview of

some of the lines of research that have been pursued in the program in the past few years. As the previous discussion suggests, however, the work done in the program is so diverse that we can only discuss a small part of it.

The Zero Lower Bound on Nominal Interest Rates

When the central bank wants to stimulate the economy, its usual tool is an open-market purchase of government debt. By increasing the stock of high-powered money, the open-market purchase drives down nominal and real interest rates, and so increases consumption and investment.

Nominal interest rates, however, cannot be negative: since high-powered money has a nominal return of zero (that is, since the nominal value of a dollar next year will be a dollar), investors will never hold bonds with negative yields. Thus when the nominal interest rate on government debt reaches zero, one critical channel through which monetary policy can stimulate the economy is no longer present. Moreover, when the nominal interest rate is zero, government debt and high-powered money are perfect substitutes: both are non-interest-bearing assets issued by the government. In this situation, an open-market purchase is just an exchange of two assets that are perfect substitutes. Thus, there is reason to fear it will have no effects.

Until recently, the possibility of an economy finding itself in such a “liquidity trap” seemed to be only a historical and theoretical curiosity. Two developments, however, changed that perception. First, in Japan, short-term nominal interest rates were virtually zero for most of the period from 1999 until quite recently. Second, in the United States, the combination of very low inflation and a weak recovery caused the Federal Reserve to push the federal funds rate down to one percent in the summer of 2003 and raised the possibility that it might want to lower the funds rate further.

These developments led to a flurry of research by members of the Monetary Economics program. This work, led by Lars E. O. Svensson and Michael Woodford and their co-authors (10195, 9968), has established that monetary policy can continue to influence the economy when the nominal interest rate is at its zero lower bound. The key mechanism by which it can do so is by influencing expectations of *future* money supplies. Once the nominal interest rate is positive again, the money supply will certainly be able to affect output and inflation. Thus expectations today of higher money supplies once nominal interest rates are no longer zero will raise expected inflation, and so lower real interest rates and stimulate the economy. This research formalizes these insights, analyzes optimal policy in this setting, and addresses the critical issue of how the central bank can affect expectations.

Federal Reserve policy during the period of very low interest rates followed these prescriptions to a significant extent. In the summer of 2003, the Federal Reserve began for the first time to include explicit indications of its intentions about future policy in its policy statements. Starting in August, it stated that it expected that low interest rates could be “maintained for a considerable period.” When it finally began to raise its target for the funds rate in June 2004, it said that it expected to do so “at a pace that is likely to be measured.”

Research in the Monetary Economics program has studied many other aspects of the zero lower bound on nominal interest rates. The topics considered include means of managing expectations (for example, 10679, 11056); possibilities for using fiscal policy in this situation (for example, 9623, 10290, 10840, 11374); open economy considerations (for example, 12703); historical evidence about episodes of falling prices and very low nominal interest rates (for example, 3829, 9520, 10268, 10329, 10833); and detailed studies of Japan’s experience (for example, 10818, 10878, 11151).

Optimal Monetary Policy

A half century ago, monetary policy was conducted almost completely in a “seat of the pants” manner. Policymakers had only a partially articulated view of their objectives and nothing close to an explicit statement of the weights they attached to the different objectives. They responded to developments on an ad hoc basis, moving from one episode to the next with a general sense of what they wanted to accomplish and of how they might achieve it, but without an explicit framework or anything approaching a rule for conducting policy.

Obviously, this is not how one would most like policy to be made. The ideal would be to have a central bank objective function that was based on the underlying objectives of the households in the economy, and to have a rule for monetary policy that was derived from this objective function and an accurate description of the structure of the economy.

Not surprisingly, our understanding remains well short of this objective. Nonetheless, there have been significant advances. Much of the work in this effort is technical and incremental, but it is making steady progress. To give just one example, many initial analyses of optimal policy in models built up from microeconomic foundations required the highly unrealistic assumption that the long-run equilibrium of the economy was close to the first best. Recent research by Monetary Economics program members Pierpaolo Benigno and Michael Woodford has relaxed this assumption, thus bringing the analysis one important step closer to reality (10838, 10839).

This general line of research has now progressed to the point where researchers in the program are actively exploring complete micro-founded models of optimal monetary policy. The models allow for substantive discussions of such issues as the welfare implications of different targeting rules, whether simple interest rate rules for monetary policy deliver desirable outcomes, and the importance

of forward-looking behavior by the central bank (see, for example, 9491, 9929, 11523, 11896, 12158, 12898).

Despite this remarkable progress, the models are still missing important elements. For example, their explanation of why inflation is undesirable bears little resemblance to the concerns expressed by policymakers, businesspeople, and the public, and the models often use assumptions about price-setting that have unrealistic implications for the dynamics of inflation. Thus, although the models provide valuable insights, they remain far from the point where one would want to use them as the basis of actual policymaking.

While the effort to construct reliable fully-founded analyses of optimal monetary policy continues, in the meantime many analyses of policy take shortcuts. For example, in the absence of a believable central bank objective function derived from first principles, an appealing alternative is to directly specify an objective function in terms of the behavior of aggregate variables. Similarly, it is often helpful to restrict one's attention to a specific class of possible rules for monetary policy (such as ones that make the interest rate a linear function of a small number of variables) rather than considering all possible monetary policies. Another powerful shortcut is to specify some relations among aggregate variables directly instead of attempting to derive them from microeconomic foundations. Program member Lars E. O. Svensson, for example, has used this type of shortcut-based approach to address the issues of how policymakers' subjective judgments can be incorporated into policymaking (9421, 11167). He shows that the fact that policymakers' usually have more information than can be explicitly incorporated into a rule for setting interest rates favors "targeting rules" over "instrument rules." That is, it favors specifying policy in terms of policymakers' expectations of the variables of ultimate interest, such as output and inflation, rather than in terms of an immediate instrument of monetary policy, such as a short-term interest rate. Similarly, this

sort of non-fully-grounded approach is well suited to addressing such complicated issues as how the existence of low probability but extreme events should affect policymaking (10196), and the role of uncertainty about the true model in policymaking (9566, 10025, 11733).

The Effects of Monetary Policy

A classic question — perhaps *the* classic question — in monetary economics is how changes in monetary policy affect the economy. Recent research in the Monetary Economics program has extended work on this issue in several directions.

Research by Gary Richardson and William Troost (12591) provides striking new evidence about an old and hotly debated question within this general area: could Federal Reserve intervention have prevented bank failures during the Great Depression? There is general agreement that the massive fall in the money supply played a crucial role in the Depression, and that bank failures played an important role in that fall. In earlier work, Charles Calomiris and Joseph Mason argued, however, that the banks that failed did so not because they were the victims of panics that left them without liquidity, but rather because they were genuinely insolvent (4934, 7919). If so, then while general monetary expansion presumably would have mitigated the Depression, efforts by the Federal Reserve merely to provide short-run liquidity to distressed banks would have done little good.

Richardson and Troost's insight is that the different regional Federal Reserve banks had very different policies during this period. In particular, the Federal Reserve Bank of Atlanta acted aggressively to help banks facing panics, while the Federal Reserve Bank of St. Louis did little. In addition, largely by historical accident, one half of Mississippi is in the Atlanta Federal Reserve district and the other half is in the St. Louis district; and the two parts of the state (especially in the area near the border between the two districts) are

very similar in other ways. Thus, comparing the performance of the banks in the two halves of the state provides an almost ideal experiment for determining the effects of Federal Reserve intervention on banks facing panics. Richardson and Troost find that in the critical early years of the Depression, there were dramatically fewer bank failures in the part of Mississippi in the Atlanta district than in the part in the St. Louis district. Thus, it appears that even in conditions as severe as those of the Depression, central bank intervention can greatly reduce the effects of banking panics.

A central problem in determining the effects of monetary policy on output and inflation is that monetary policymakers base their actions on an enormous amount of information. The Federal Reserve, for example, devotes vast resources to monitoring economic conditions and forecasting likely economic developments. If the Federal Reserve uses this information to successfully stabilize the economy, then an economist studying monetary policy would observe output and prices growing steadily in the face of frequent changes in monetary policy, and so might falsely conclude that policy actions have little effect. And because policymakers consider so much information, the straightforward strategy of simply controlling for the variables considered by policymakers is not even remotely possible.

Recent research in the ME program has proposed two novel ways of addressing this problem. Ben Bernanke, Jean Boivin, and Piotr Eliaszc use factor analysis, a statistical procedure for identifying common movements in a large number of series. They summarize the information available to the Federal Reserve by considering a large number of time series and then using factor analysis to identify a small number of types of co-movement in the series. They find that this approach yields much more plausible estimates of the macroeconomic effects of changes in monetary policy than estimates that attempt to summarize the information available to the Federal Reserve by considering only a few series.

In our own research, we exploit the fact that the Federal Reserve staff summarizes its assessment of the implications of all the data it examines by constructing a macroeconomic forecast (9866). We therefore examine the behavior of output and inflation following changes in the Federal Reserve's target for the federal funds rate that differ from its normal response to its forecasts of output and inflation. Even more than Bernanke, Boivin, and Eliasz, we find that accounting for the information that goes into policy decisions has a large effect on estimates of the effects of changes in monetary policy, and leads to estimated effects that are faster and larger than previous estimates.

A related strand of research in the program investigates the effects of an important recent development in monetary policy. One major change in monetary policy over the past two decades has been the adoption of inflation targeting by many central banks. An obvious question is therefore whether inflation targeting has important effects on macroeconomic outcomes. This issue is being actively investigated (and debated) in the program. Research by Laurence M. Ball and Niamh Sheridan concludes that the main difference between inflation targeters and non-targeters is that the non-targeters started from worse situations, and that this difference (and not the adoption of targeting) accounts for the greater improvement in macroeconomic performance in these countries (9577). However, research by Antonio Fatás, Ilian Mihov, and Andrew K. Rose and by Frederic S. Mishkin and Klaus Schmidt-Hebbel, using somewhat different samples and approaches, finds a beneficial effect of inflation targeting (10846, 12876). Research on this issue continues.

Some other recent research on the effects of monetary policy exploits the fact that central banks usually make changes in monetary policy through discrete, readily observable actions. For example, the Federal Reserve typically keeps its target for the federal funds rate fixed for extended periods; when

it changes the target, it announces the change. This feature of policy allows researchers to estimate the impact of unexpected monetary policy actions on interest rates, stock prices, and other financial market variables with considerable precision. NBER researchers have used this idea to address a variety of issues. For example, Linda S. Goldberg and Michael W. Klein show that over the first six years the European Central Bank was in operation, the response of interest rates and exchange rates to policy actions changed in a way that suggests that market participants were becoming increasingly convinced of the ECB's commitment to keeping inflation stable (11792).

To give another example, in research presented at a meeting of the Monetary Economics program, Refet Gürkaynak, Andrew Levin, and Eric Swanson use the response of financial market variables to discrete monetary policy actions and to other discrete macroeconomic developments (notably data releases) to provide evidence about whether explicit inflation targeting keeps long-term inflation expectations stable.¹ Specifically, they focus on the forecasts of inflation at long horizons implicit in nominal and inflation-indexed bonds of different maturities. They find that the implied inflation forecasts are responsive to news in economies without explicit inflation targets, such as the United States and the United Kingdom before 1997. In economies with inflation targeting, however, the implied forecasts are virtually impervious to news. Thus, their evidence suggests that an explicit inflation target helps anchor expectations of inflation in the long run.

Program researchers have investigated numerous other questions about the effects of monetary policy. Examples include differences in the effects of monetary policy in the United States over time (9459); the importance of credibility to the effects of monetary policy (11562); differences in the effects of monetary policy between the United States and Europe (9984, 9985); and the effects of changes in the Federal Reserve's

implicit target rate of inflation (12492).

The Great Moderation

One striking feature of modern macroeconomies is that the business cycle has been dramatically tamed. In the United States, for example, there have been only two recessions—both of them mild—over the past 25 years; over the previous 35 years, in contrast, there were eight.

This “great moderation” of the economy has attracted considerable attention from researchers in monetary economics. Margaret McConnell and Gabriel Perez-Quiros carefully document the change in business cycle volatility for the United States, establish that it is almost certainly not a random statistical fluctuation, and show that the break occurred in the early 1980s.² James H. Stock and Mark W. Watson show that most—though not all—major industrialized countries have experienced similar changes (9859).

Several theories of this striking change have been proposed. One possibility is that it reflects structural changes in modern economies. McConnell and Perez-Quiros, for example, find that the moderation in overall output volatility is largely associated with changes in the behavior of inventory investment. They therefore argue that changes in inventory management technology are a likely candidate cause of the great moderation.

This conclusion is challenged, however, by a careful analysis of the U.S. automobile industry by Valerie A. Ramey and Daniel Vine (10384). They show that the automobile sector has experienced similar changes in volatility and in the behavior of inventory investment as the economy as a whole. They also find that in autos, where we have higher-quality and higher-frequency sales data than for the economy as a whole, there has been an important decline in the persistence of changes in sales. They then demonstrate that such a change in persistence would be likely to lead endogenously to a sharp change in the behavior of inventory investment of the type we have observed even without *any* changes in

inventory management technology. Intuitively, consider an auto manufacturer faced with a decline in sales. If the manufacturer expects the fall to be permanent, it will want to reduce its inventories to prevent its inventory-sales ratio from rising permanently. But if it expects the fall to be highly transitory, it is likely to want to temporarily increase its inventories to avoid the costs associated with quickly reducing production and then increasing it again. Thus, Ramey and Vine's analysis strongly suggests that changes in inventory management technology are not the underlying source of the moderation.

Another possibility is that the moderation is simply the result of good luck. The 1970s, for example, saw major, unprecedented disruptions of world oil markets. Stock and Watson are the most prominent advocates of the hypothesis that the great moderation stems largely from a decline in the size of the exogenous shocks impinging on the economy (9127, 9859). Estimating a variety of reduced-form and simple structural models, they find that the variance of shocks of all types has been smaller in recent decades, and that this decline is the main proximate source of the reduction in business cycle volatility.

This view, too, has been challenged. In research recently presented to the Monetary Economics program, Luca Benati and Paolo Surico construct an artificial economy in which a change in

the way monetary policy is conducted manifests itself to a researcher as an apparent decline in the size of the non-policy shocks hitting the economy.³ The importance of Benati and Surico's finding is not clear, however: one issue that was raised in the discussion of the paper when it was presented was the extent to which their result depends on special features of their example and to what extent it is generalizable.

A final possibility is that the stabilization is the result of improved policy. This hypothesis has obvious appeal. In our own work, we have found that monetary policymakers have been guided by a better understanding of the economy in recent decades and have largely avoided episodes where they first pursued expansionary policies that caused inflation to rise and then pursued extremely tight policies to bring inflation back down (6948, 9274). Unfortunately, researchers have had only limited success in finding persuasive ways of constructing formal statistical estimates of the contribution of improved policy to the great moderation. Active research on these issues is continuing, however (for example, 10973, 11147, 11777, 11946, 12022).

Concluding Remarks

In our view, what emerges from this discussion is a sense of the breadth and vibrancy of monetary economics. Researchers are addressing an extremely

broad range of issues using a very wide range of approaches. This diversity is one of the great strengths of the Monetary Economics program. If it were possible to determine in advance which lines of research would bear fruit and which would prove unproductive, a narrowly focused research agenda would make sense. But since it is not possible, pursuing a multitude of different approaches is the best way to ensure that our understanding of monetary economics continues to advance.

¹ R. Gürkaynak, A. Levin, and E. Swanson, "Does Inflation Targeting Anchor Long-Run Inflation Expectations? Evidence from Long-Term Bond Yields in the U.S., U.K., and Sweden," unpublished paper, Federal Reserve Board, October 2006. Presented at the Monetary Economics Program Meeting, November 4, 2005.

² M. McConnell and G. Perez-Quiros, "Output Fluctuations in the United States: What Has Changed since the Early 1980s?" *American Economic Review* 90 (December 2000), pp. 1464–76.

³ L. Benati and P. Surico, "VAR Analysis and the Great Moderation," unpublished paper, Bank of England, 2007. Presented at the Monetary Economics Summer Institute, July 9, 2007.

Households, Institutions, and Financial Markets

John Y. Campbell*

Economists studying asset pricing have begun to grapple seriously with the extraordinary diversity of financial market participants. Investors, including both households and financial institutions, differ in their overall resources, current and future labor income, housing and other assets that are expensive to trade, tax treatment, access to credit, attitudes towards risk, time horizons, and sophistication about financial markets. My recent research measures and models this heterogeneity, with a particular focus on time horizons and financial sophistication.

Behavioral finance emphasizes that some investors are likely to be more sophisticated about financial markets than others. Early behavioral models emphasized a distinction between “noise traders” and sophisticated arbitrageurs, the former trading randomly and creating profits for the latter.¹ This of course raises the question of who can be described as a noise trader. Discussions at conferences are sometimes reminiscent of the old verse “It isn’t you, it isn’t me, it must be that fellow behind the tree.” Recent literature has argued that institutional investors act as arbitrageurs, while the household sector as a whole may play the role of noise traders.

Identifying Institutional Trading Activity

To test this idea, one would like to be able to measure institutional trading

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at relatively high frequency to see if institutions arbitrage well-known anomalies in asset returns. In the United States, large institutional investors are required to report their equity positions to the Securities and Exchange Commission quarterly in 13-F filings. Numerous papers have aggregated these reports and have looked at the implied quarterly positions of institutional investors.² Household positions can then be treated as the complement, if one interprets households broadly to include small institutions and certain foreign investors.

An alternative approach is to look at trades of different sizes. It is often assumed that large trades are carried out by institutions while small trades more likely reflect individual buying or selling. The Trade and Quotes (TAQ) database allows researchers to measure each trade in each stock, and to classify trades as buys and sells based on their relation to previous quotes. Several researchers have found that large trades appear to exploit phenomena such as price and earnings momentum.³

It is natural to ask whether these two approaches are consistent. In quarters where a stock has been subject to a high volume of large buy orders, does the stock end up with higher institutional ownership at the end of the quarter? In joint work with Tarun Ramadorai and Allie Schwartz, I have studied this question in data from the late 1990s and have found that both unusually large and unusually small trades appear to indicate institutional activity.⁴ This does not necessarily mean that small trades are more likely to be institutional; rather, it may reflect a tendency for small trades to accompany large institutional trades so that small

trades increase the probability that large ones are indeed institutional.

Using the estimated relation between trades of different sizes and institutional ownership, Ramadorai, Schwartz, and I construct daily institutional flows in individual stocks and find that they have several interesting characteristics. Daily institutional trades are highly persistent and respond positively to recent daily returns but negatively to longer-term past daily returns. Institutional trades, particularly sales, generate short-term losses but longer-term profits. One source of these profits is that institutions anticipate both earnings surprises and post-earnings-announcement drift (the tendency for stock prices to continue moving in the same direction after an earnings surprise).

These results suggest that institutional investors do exploit certain well-known patterns in stock returns, but in doing so they trade urgently and move prices against themselves, causing prices to rise temporarily when they buy and, even more noticeably, to fall temporarily when they sell. As prices return to normal a day or two after institutional trading, institutions appear to make losses but in the longer run they earn profits from their abilities to pick stocks.

How do Institutions Perceive Risks?

If institutional investors understand anomalous patterns in the cross-section of stock returns and trade to exploit them, why are these patterns not arbitrated away entirely? One possibility is that institutions are deterred by perceived risks in certain stocks.

A long-standing anomaly in stock returns is the value effect. Stocks with low ratios of their market values to their book values (value stocks) generally outperform stocks with high market-book ratios (growth, or glamour stocks). This is true even though in recent decades growth stocks have had higher betas with the market as a whole and thus, according to the standard Capital Asset Pricing Model (CAPM), should have delivered higher average returns.

In two recent papers, with Tuomo Vuolteenaho and with Christopher Polk and Vuolteenaho, I have argued that long-term rational investors who hold an equity portfolio may perceive value stocks as relatively risky despite their low market betas.⁵ Long-term rational investors care not about short-term fluctuations in the value of their holdings, but about volatility in the income stream that is generated by those holdings over the long term. To the extent that stock prices are subject to both permanent movements, attributable to changing expected corporate cash flows, and temporary movements, driven by changes in the discount rates applied to those cash flows, long-term rational investors will perceive the former movements as riskier than the latter.⁶ This point is particularly relevant for institutions with long investment horizons such as pension funds.

Vuolteenaho and I find that value stocks have a stronger tendency to co-vary with permanent movements in stock prices, while growth stocks have a stronger tendency to co-vary with temporary movements. These patterns imply that sufficiently conservative long-term investors should avoid value stocks even though they offer higher average returns and lower short-term risks than growth stocks. Pension funds, for example, may be reluctant to exploit the value effect and this may help to explain its persistence in equilibrium.

An important question is why value and growth stocks respond so differently to permanent and temporary movements in the aggregate market. Some authors have suggested that growth stocks are merely those stocks that are currently

avored by irrational investors; if these investors become optimistic and bid up the market as a whole, they disproportionately drive up the prices of their favored growth or “glamour” stocks.⁷ Polk, Vuolteenaho, and I show, however, that not only the prices of growth stocks but also their profits are particularly sensitive to temporary changes in aggregate stock prices. This implies that in order to understand the value-growth anomaly, one must look at the underlying businesses of value and growth stocks to understand how their profits respond to investor sentiment and other economic forces.

Are Some Households More Sophisticated than Others?

While institutions do appear to trade profitably with households, it is also natural to suppose that some households are more sophisticated investors than others. To investigate this hypothesis requires detailed microeconomic data on household financial behavior along with variables such as wealth, income, and education that might proxy for financial sophistication. Several papers have used survey data to show that richer and more educated households are both more likely to participate in risky financial markets, and to participate more aggressively.⁸ These findings are consistent with the idea that less sophisticated households are uncomfortable with risky investment opportunities and fail to take advantage of them; however, they are also consistent with greater risk aversion among poorer households and the existence of fixed costs for stock market investing.

One would like to go beyond asset allocation decisions to look at the ability of households to diversify their portfolios. This is difficult to do using survey data, because surveys rarely ask questions about individual asset holdings. The need to keep up participation rates forces survey designers to keep their questions fairly general and easy to answer. Some researchers have looked at data from account providers, but account-level data reveal the positions of a non-random sub-

set of the population and may be incomplete even for these households, who may also have accounts with other financial institutions.

In Sweden the government levies a wealth tax and, in order to collect it, assembles records of financial assets, mutual funds, and real estate, down to the individual security and property level, using statements from financial institutions that are verified by taxpayers. The dataset also provides information on the income, demographic composition, education, and location of all households. Laurent Calvet, Paolo Sodini, and I have used the Swedish data to analyze the financial behavior of the entire population of an industrialized country.⁹

Many Swedish households appear to be quite well diversified. Under the assumption that the efficient stock market investment is a currency-hedged global stock market index, we find that the median household loses about 1.2 percent in average portfolio return, or \$130 per year, relative to a fully efficient investment strategy with the same volatility. The losses are much smaller—one quarter the size—relative to a global stock market index without currency hedging, an investment strategy that is more readily available to Swedish households through global equity mutual funds.

For a minority of households, however, the losses from under-diversification are much larger: we find that 5 percent of households lose over 5 percent in average portfolio return or \$2,200 per year. Poorer households with less education are more likely to invest inefficiently, earning only a small reward for the risk they take. They are also more likely to invest cautiously, which limits their losses from under-diversification but may deprive them of the chance to earn higher returns through intelligent risktaking.

The diversification of Swedish households in part reflects their reliance on broadly diversified mutual funds. In effect households are relying on fund managers to handle the diversification problem. In ongoing research, however, Calvet, Sodini, and I look at household decisions

to rebalance their portfolios, decisions that are rarely delegated.¹⁰ We find that more educated and richer households rebalance more aggressively, offsetting stock market gains by selling to trim the share of risky assets in the portfolio, and offsetting losses by buying. The median household trades actively enough to offset about two thirds of the change in the risky portfolio share that would occur if the household failed to trade.

Differences in household sophistication also appear to be important in mortgage markets. In the United States, the most common type of mortgage offers a long-term fixed rate with an option to refinance at any time. The refinancing decision is difficult to manage because refinancing incurs fixed costs and interest rates are random. Even when interest rates fall to the level at which interest savings cover the fixed cost of refinancing, it may still be advantageous to wait to obtain greater savings with a single refinancing. Historically, a few households have refinanced aggressively, but many others have failed to refinance when it is clearly advantageous to do so. Using data from the American Housing Survey, I have found that less educated and poorer households are less likely to refinance during times of falling interest rates, and more likely to pay higher mortgage rates, even controlling for financial circumstances that may limit their access to credit.¹¹

Financial Innovation and Unsophisticated Households

Given the complexity of the household financial optimization problem, it may not be surprising that some households make investment mistakes. What is perhaps surprising is that simple financial products have not driven out complicated ones that households find difficult to use. One possible explanation is that sophisticated households, who are the natural early adopters of any financial innovation, benefit from existing products that offer them a cross-subsidy from unsophisticated households. Conventional fixed-rate mortgages, for example, are

cheaper because some households do not refinance when it is advantageous to do so, giving mortgage lenders profits that they pass on to consumers through competitive mortgage pricing. An automatically refinancing mortgage would benefit an unsophisticated household but would be more expensive for any household that understands how to refinance a conventional mortgage. If it is costly to explain the benefits of an automatically refinancing mortgage, particularly to an unsophisticated household, then such a product may not be able to gain a foothold in the market.¹²

Recent decades have seen many financial innovations that are relatively easy for households to use, including indexed mutual funds and life-cycle funds that adjust asset allocation as retirement approaches. Other financial innovations, notably sub-prime mortgages, appear much more difficult for unsophisticated households to understand. Important tasks for financial economists are to promote the development of innovative financial products that make decisionmaking easier for unsophisticated households, and to understand the circumstances under which financial regulation may be a necessary part of consumer protection.

¹ J. B. DeLong, A. Shleifer, L.H. Summers, and R.J. Waldmann, "Noise Trader Risk in Financial Markets", *Journal of Political Economy* 98, pp. 703–38 (1990).

² See for example P.A. Gompers and A. Metrick, "Institutional Investors and Equity Prices", *Quarterly Journal of Economics* 116, pp. 229–60 (2001), and R. Cohen, P.A. Gompers, and T.O. Vuolteenaho, "Who Underreacts to Cashflow News? Evidence from Trading Between Individuals and Institutions", *Journal of Financial Economics* 66, pp. 409–62 (2002).

³ See for example S. Hvidkjaer, "A Trade-Based Analysis of Momentum", forthcoming *Review of Financial Studies* (2007), or U. Malmendier and D. Shanthikumar, "Are Small Investors Naïve About Incentives?" forthcoming

Journal of Financial Economics (2007).

⁴ The first version of this paper appeared as J. Campbell, T. Ramadorai, and T. Vuolteenaho, "Caught on Tape: Institutional Order Flow and Stock Returns", NBER Working Paper No. 11439, June 2005. A substantial revision is J. Campbell, A. Schwartz, and T. Ramadorai, "Caught on Tape: Institutional Trading, Stock Returns, and Earnings Announcements" (June 2007).

⁵ J. Campbell and T. Vuolteenaho, "Bad Beta, Good Beta", NBER Working Paper No. 9509, February 2003, and *American Economic Review* 94, pp. 1249–75 (2004). J. Campbell, C. Polk, and T. Vuolteenaho, "Growth or Glamour? Fundamentals and Systematic Risk in Stock Returns", NBER Working Paper No. 11389, June 2005.

⁶ The seminal work on risk for long-term investors is R. Merton, "An Intertemporal Capital Asset Pricing Model", *Econometrica* 41, pp. 867–87 (1973). Vuolteenaho and I work with a discrete-time, empirically estimable version of Merton's model developed in J. Campbell, "Intertemporal Asset Pricing without Consumption Data", *American Economic Review* 83, pp. 487–512 (1993). We show that the beta of the CAPM can be broken into two components, the permanent or "bad" beta and the temporary or "good" beta. In a model with a representative investor with risk aversion γ , the price of risk for bad beta should be γ times higher than the price of risk for good beta.

⁷ N. Barberis, A. Shleifer, and J. Wurgler, "Comovement", *Journal of Financial Economics* 75, pp. 283–317 (2005).

⁸ See for example C. Carroll, "Portfolios of the Rich", in L. Guiso, M. Haliassos, and T. Jappelli eds. *Household Portfolios*, MIT Press (2002), or J. Heaton and D. Lucas, "Portfolio Choice and Asset Prices: The Importance of Entrepreneurial Risk", *Journal of Finance* 55, pp. 1163–98 (2000). These results are surveyed in my presidential address to the American Finance Association, J. Campbell, "Household Finance", NBER Working Paper No. 12149, April 2006,

and *Journal of Finance* 61, pp. 1553-1604.

⁹ L. Calvet, J. Campbell, and P. Sodini, "Down or Out: Assessing the Welfare Costs of Household Investment Mistakes", NBER Working Paper No. 12030, February 2006.

¹⁰ L. Calvet, J. Campbell, and P. Sodini,

"Fight or Flight? Portfolio Rebalancing by Individual Investors", unpublished paper, March 2007.

¹¹ J. Campbell, "Household Finance". See also A. Schwartz, "Household Refinancing Behavior in Fixed Rate Mortgages", unpublished paper, Harvard University (2007).

¹² A formal model is developed in X. Gabaix and D. Laibson, "Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets", *Quarterly Journal of Economics* 121, pp. 505-40. J. Campbell, "Household Finance", applies the model to mortgages.

NBER Profile: John Y. Campbell

John Y. Campbell is a former Director of the NBER's Program in Asset Pricing and currently is a Research Associate in that program and in the Monetary Economics and the Economic Fluctuations and Growth Programs. He is also the Morton L. and Carole S. Olshan Professor of Economics at Harvard University.

Campbell grew up in Oxford, England, and received a B.A. from Oxford in 1979. He came to the United States to attend graduate school, earning his Ph.D. from Yale in 1984. He spent the next ten years teaching at Princeton, moving to Harvard in 1994.

Campbell has published over 70 articles on various aspects of finance and macroeconomics, including fixed-income securities, equity valuation, and portfolio choice. His two books, *The Econometrics of Financial Markets* (with Andrew Lo and Craig MacKinlay, Princeton University Press, 1997) and *Strategic Asset Allocation: Portfolio Choice for Long-Term Investors* (with Luis Viceira, Oxford University Press, 2002),

have both won Paul Samuelson Awards for Outstanding Scholarly Writing on Lifelong Financial Security from TIAA-CREF.

Campbell has co-edited the *American Economic Review* and the *Review of Economics and Statistics*. He is a Fellow of the Econometric Society and the American Academy of Arts and Sciences, and served as President of the American Finance Association in 2005. At Harvard, Campbell helps to oversee the investment of the endowment as a board member of the Harvard Management Company. He is also a founding partner of Arrowstreet Capital, LP, a Cambridge-based quantitative asset management firm that manages over \$20 billion in equities for large institutional clients.

Campbell and his wife, Susanna Peyton, live in Lexington, Massachusetts, where they busily facilitate the comings and goings of their four children. Campbell finds a little time for his long-time interest of choral singing, and often rides a red tandem bicycle with his oldest son.



Conferences

Innovation Policy and the Economy

The NBER's eighth annual Conference on Innovation Policy and the Economy took place in Washington on April 12. The conference was organized by NBER Research Associates Adam B. Jaffe of Brandeis University, Joshua Lerner of Harvard University, and Scott Stern of Northwestern University. The following papers were discussed:

Wesley M. Cohen, Duke University and NBER, and **John P. Walsh**,

Georgia Institute of Technology, "Real Impediments to Academic Biomedical Research"

Robert E. Litan, **Lesla Mitchell**, and **E.J. Reedy**, Ewing Marion Kauffman Foundation, "Commercializing University Innovations: A Better Way"

Shane Greenstein, Northwestern University and NBER, "Economic Experiments and Industry Know-How

in Internet Access Markets"

Carl Shapiro, University of California, Berkeley, "Patent Reform: Aligning Reward and Contribution"

Jean Tirole, Institut d'Economie Industrielle, Toulouse, and **Joshua Lerner**, "Public Policy toward Patent Pools"

Numerous scholars have expressed concern over the growing "privatization of the scientific commons" represented by the growth in academic patenting. However, even before the Bayh-Dole Act and the pervasive patenting of academic science, there was an earlier concern over the extent to which the drive for recognition among scientists and competition for priority and associated rewards also limited contributions to the scientific commons. This suggests the utility of a more open-ended consideration of the different factors—not just patenting—that might affect knowledge flows across scientists. **Cohen** and **Walsh** suggest, first, that one might distinguish between legal and practical excludability—and that practical excludability, at least in the world of academic research, may have little to do with patents. At the same time, however, they suggest that excludability may indeed be a real concern for academic, and particularly biomedical research, but to understand where and how it occurs, they need to look beyond patents to consider additional ways in which flows of knowledge and other inputs into research may be restricted (including secrecy and control over materials). They do find restrictions imposed on the flow of knowledge and material across biomedical researchers. While intellectual property plays some role, it is not determinative. They find that what matters are both academic and com-

mercial incentives, and effective (that is, cost effective) excludability. This practical excludability is rarely associated with the existence of a patent in academic settings, but may be more readily imposed through secrecy or not sharing research materials.

Litan, **Mitchell**, and **Reedy** note that with the passage of the Bayh-Dole Act of 1980, the federal government explicitly endorsed the transfer of exclusive control over government-funded inventions to universities and businesses operating with federal contracts. While this legislation was intended to accelerate further development and commercialization of the ideas and inventions developed under federal contracts, the government did not provide any strategy, process, tools, or resources to shepherd innovations from the halls of academia into the commercial market. And more than 25 years later, it is clear that few universities have established an overall strategy to foster innovation, commercialization, and spillovers. Multiple pathways for university innovation exist and can be codified to provide broader access to innovation, allow a greater volume of deal flow, support standardization, and decrease the redundancy of innovation and the cycle time for commercialization. Technology Transfer Offices (TTOs) were envisioned as gateways to facilitate the flow of innovation but instead have become gatekeepers, in many cases constraining the flow of

inventions and frustrating faculty, entrepreneurs, and industry. The authors discuss potential changes focused on creating incentives that will maximize social benefit from the existing investments being made in R&D and commercialization on university campuses.

Innovation within Internet access markets can be usefully understood through the lens of *economic experiments*. Economic experiments yield lessons to market participants through market experience. **Greenstein** distinguishes between directed and undirected economic experiments and discusses how the spreading of lessons transforms a market. As a lesson becomes common, it becomes a part of industry know-how. Further innovations build on that know how, renewing a cycle of experimentation. Greenstein ends with insights about why some market institutions encourage economic experiments and what policy can do to nurture a positive outcome.

Economists and policymakers have long recognized that innovators must be able to appropriate a reasonable portion of the social benefits of their innovations if innovation is to be suitably rewarded and encouraged. However, **Shapiro** identifies a number of specific fact patterns under which the current U.S. patent system allows patent holders to capture private rewards that *exceed* their social contri-

butions. Such excessive patentee rewards are socially costly, since they raise the deadweight loss associated with the patent system and discourage innovation by others. Economic efficiency is promoted if rewards to patent holders are aligned with and do not exceed their social contributions. He analyzes two major reforms to the patent system designed to spur innovation by better aligning the rewards and contributions of patent holders: establishing an independent invention defense in patent infringement cases, and strengthening the procedures by which patents are re-examined after they are issued. Three additional reforms relating to patent liti-

gation are also studied: limiting the use of injunctions, clarifying the way in which “reasonable royalties” are calculated, and narrowing the definition of “willful infringement.”

The past two decades have seen an explosion of patent awards and litigation across a wide variety of technologies, which numerous commentators have suggested has socially detrimental consequences. Patent pools, in which owners of intellectual property share patent rights with each other and third parties, have been proposed as a way in which firms can address this “patent thicket” problem. **Lerner** and **Tirole** discuss the

current regulatory treatment of patent pools and highlight why a more nuanced view than focusing on the extreme cases of perfect complements and perfect substitutes is needed. They also highlight the importance of regulators’ stances toward independent licensing, grantback policies, and royalty control. Finally, they present case study and large-sample empirical evidence.

These papers will appear in an annual volume published by the MIT Press. Its availability will be announced in a future issue of the *Reporter*. They can also be found at “Books in Progress” on the NBER’s website.

An Economic Perspective on the Problems of Disadvantaged Youth

An NBER Conference on “An Economic Perspective on the Problems of Disadvantaged Youth,” organized by Jonathan Gruber of NBER and MIT, was held on April 13–14, 2007. The conference was funded by the Annie E. Casey Foundation. The following papers were presented and discussed:

David Figlio, University of Florida and NBER, and **Jeffrey Roth**, University of Florida, “The Behavioral Consequences of Pre-Kindergarten Participation for Disadvantaged Youth”
Discussant: Elizabeth Cascio, Dartmouth College and NBER

Melissa Kearney, Brookings Institution and NBER, and **Phillip Levine**, Wellesley College and NBER, “Socioeconomic Disadvantage and Early Childbearing”
Discussant: Sandra Black, University of California, Los Angeles and NBER

Julie Berry Cullen, University of California, San Diego and NBER, and **Brian Jacob**, Harvard University and

NBER, “Is Gaining Access to Selective Elementary Schools Gaining Ground? Evidence from Randomized Lotteries”
Discussant: Jacob Vigdor, Duke University and NBER

Philip Oreopoulos, University of Toronto and NBER, “Would More Compulsory Schooling Help Disadvantaged Youth? Evidence from Recent Changes to School-Leaving Laws”
Discussant: Susan Dynarski, Harvard University and NBER

Janet Currie, Columbia University and NBER, and **Mark Stabile**, University of Toronto and NBER, “Mental Health in Childhood and Human Capital”
Discussant: Jane Waldfogel, Columbia University

Patricia Anderson, Dartmouth College and NBER, **Kristin Butcher**, Federal Reserve Bank of Chicago, and **Diane Schanzenbach**, University of Chicago, “Childhood Disadvantage and Obesity: Is Nurture Trumping Nature?”

Discussant: John Cawley, Cornell University and NBER

Marianne Page and **Ann Huff Stevens**, University of California, Davis and NBER, and **Jason Lindo**, University of California, Davis, “Parental Income Shocks and Outcomes of Disadvantaged Youth in the United States”
Discussant: Bruce Meyer, University of Chicago and NBER

Rajeev Dehejia, Tufts University and NBER; **Thomas DeLeire**, Michigan State University; **Erzo Luttmer**, Harvard University and NBER; and **Joshua Mitchell**, Harvard University, “The Role of Religious and Social Organizations in the Lives of Disadvantaged Youth”
Discussant: Daniel Hungerman, University of Notre Dame and NBER

Anna Aizer, Brown University and NBER, “Neighborhood Violence and Urban Youth”
Discussant: Jens Ludwig, Georgetown University and NBER

Figlio and **Roth** investigate the effects of public pre-kindergarten par-

ticipation on the subsequent behavioral outcomes of disadvantaged youth. They

use a unique longitudinal dataset that links student birth records to pre-kin-

dergarten participation for every child born in Florida on or after 1994 who subsequently attended public school in Florida. They find that children whose neighborhood-zoned elementary school offers a pre-kindergarten program are more likely to attend. Further, differences persist within families whose local schools add or drop programs. Specifically, within a family, the sibling with easier access to public pre-kindergarten — measured by the fact that his or her locally-zoned elementary school offers a pre-kindergarten program when he or she is four years old — is considerably more likely to attend. Using this differential access within a family as an instrument to predict public pre-kindergarten attendance, the authors find that pre-kindergarten participation reduces the likelihood of behavioral problems at school or classification of emotional disabilities, at least in the very disadvantaged neighborhoods where center-based Head Start is also offered.

To what extent does socioeconomic disadvantage lead to early childbearing? **Kearney** and **Levine** first use the Panel Study of Income Dynamics (PSID) to confirm the results of past studies showing that being born to a young mother, a mother with a low level of education, or an unmarried mother, is associated with substantially higher rates of teen childbearing. Then they use Vital Statistics natality data from 1968 to 2003 to consider whether the relationship is causal. To do so, they construct data for several state/year birth cohorts, tracking their rate of disadvantage at birth along with their subsequent rate of early childbearing. Using traditional panel data methods, they then ask: if we were to reduce (or eliminate) socioeconomic disadvantage among a birth cohort of girls, how much of a reduction in their teen pregnancy should we expect? Their estimates suggest that the impact would not be very large. Defining disadvantage alternately as having been born to a mother with a low level of education, to an unmarried mother, or to a teen or

minor mother, the estimates imply that a 10 percent reduction in the proportion of a cohort with a particular disadvantage characteristic would lead to a decline of 0.5 to 2.5 percent in the proportion who give birth by age 18.

Cullen and **Jacob** review the existing evidence and provide new evidence on whether expanded access to sought-after schools can improve achievement. The setting they study is the “open enrollment” system in the Chicago Public Schools (CPS). Elementary students in Chicago can apply to gain access to public magnet schools and programs outside of their neighborhood school, but within the same school district. All but a handful of academically advanced elementary schools use lotteries to allocate spots when oversubscribed, and the authors analyze nearly 600 lotteries for grades K–4 at 34 popular schools in 2000 and 2001. Since those who randomly win and lose any given lottery will, on average, have the same characteristics, it is possible to obtain unbiased estimates of the impact of gaining access to one of these schools through a straightforward comparison of subsequent mean outcomes across the two groups, as long as there is not selective attrition. Comparing lottery winners and losers, the authors find that lottery winners attend higher quality schools as measured by both the average achievement level of peers in the school and by value-added indicators of the school’s contribution to student learning. Yet, tracking students for up to five years following the application, the authors do not find that winning a lottery systematically confers any academic benefits. This suggests that the strong cross-sectional relationship observed between test score performance and school quality for the typical CPS elementary student is largely spurious.

Dropout rates have fallen little over the last 30 years and remain disproportionately high among blacks, Hispanics, and children from low-income families. Many states have considered raising the minimum school leaving age as a means

to improve on these outcomes. Several states have already raised the school leaving age above 16, although often with exceptions. **Oreopoulos** uses these recent changes to estimate the effects from more compulsory schooling. The results suggest that more restrictive laws would reduce dropout rates, increase college enrollment, and improve career outcomes. Some caution is warranted because focusing on more recent law changes leads to more imprecision. But the consistent findings with previous studies are suggestive that compulsory high school at later ages can benefit disadvantaged youth.

Although mental disorders are common among children, we know little about their long-term effects on child outcomes. **Currie** and **Stabile** examine U.S. and Canadian children with symptoms of Attention Deficit Hyperactivity Disorder (ADHD), depression, conduct disorders, and other behavioral problems. Their work offers a number of innovations. First, they use large nationally representative samples of children from both countries. Second, they focus on “screeners” that were administered to all children in their sample, rather than on diagnosed cases. Third, they address omitted variables bias by estimating sibling-fixed effects models. Fourth, they examine a range of outcomes. Fifth, they ask how the effects of mental health conditions are mediated by family income and maternal education. They find that mental health conditions, and especially ADHD, have large negative effects on future test scores and schooling attainment, regardless of family income and maternal education.

For children overall, obesity rates have tripled from 5 percent in the early 1970s to about 15 percent by the early 2000s. For disadvantaged children, obesity rates are closer to 20 percent. At the same time, obesity rates among adults also have increased. Parental obesity is very closely tied to children’s obesity, for reasons of both nature and nurture. **Anderson**, **Butcher**, and **Schanzenbach** ask: how does parental

obesity relate to children's obesity? Is this different for disadvantaged families? Have these relationships changed over time? They find that the elasticity between mothers' and children's body mass index (BMI) has increased over the period when obesity is rising, suggesting the common parent-child environment has become more important in determining obesity. However, this increase is smaller for disadvantaged children. If the only determinants of children's body mass were their genes and the environment they share with their parents, then we would expect to find that increases in parents' BMI go a long way toward explaining the increases seen in children's BMI over the last few decades. This is not the case. Based on the estimates here of the mother-child BMI elasticity, the 4.1 percent increase in mothers' average BMI during the 1980s can explain between 20 and 30 percent of the 2.8 percent increase in children's average BMI. This suggests that there are factors in the environment that are unique to children that are important for determining their body mass, and that these factors are even more important for disadvantaged children.

Page, Stevens, and Lindo use layoffs and business closings to identify the effect of a permanent parental income shock on children's long-run socioeconomic outcomes. They find that estimates of the intergenerational effects of parental job loss are sensitive to their definition of job displacement.

Focusing on measures of displacement that are most likely to be exogenous, they find that the long-term consequences of parental job loss are substantive for children growing up in low-income families, and largest for young children.

Dehejia and his co-authors examine whether participation in religious or other social organizations can help offset the negative effects of growing up in a disadvantaged environment. Using the National Survey of Families and Households, they collect measures of disadvantage as well as parental involvement with religious and other social organizations when the youth were ages 3 to 19 and observe outcomes of the youth 13 to 15 years later. They consider a range of definitions of disadvantage in childhood (family income and poverty measures, family characteristics including parental education, and child characteristics including parental assessments of the child) and a range of outcome measures in adulthood (including education, income, and measures of health and psychological well-being). Overall, they find that youth with religiously active parents were less affected later in life by childhood disadvantage than youth whose parents did not frequently attend religious services. These buffering effects of religious organizations are most pronounced when outcomes are measured by high school graduation or non-smoking and when disadvantage is measured by family resources or

maternal education, but they also find buffering effects for a number of other outcome-disadvantage pairs. For some other social organizations, they find moderate buffering effects but these effects are not nearly as strong as for religious organizations.

Using individual survey data on urban youth and their families from Los Angeles, **Aizer** finds that the most violent neighborhoods are also characterized by the highest degree of disadvantage: greatest poverty, highest unemployment, least education. And, while living in a violent neighborhood increases the probability of exposure to violence, within violent neighborhoods those personally exposed to street violence are significantly more disadvantaged and are more likely to associate with violent peers than their (unexposed) neighbors. After controlling for underlying measures of neighborhood and family disadvantage, the impact of violence on child outcomes such as math and reading scores is considerably diminished, and for some measures of violence even disappears. This suggests that underlying disadvantage, and not exposure to neighborhood violence, is responsible for the poor child outcomes observed.

These papers will be published by the University of Chicago Press in an NBER Conference Volume; its availability will be announced in a future issue of the *NBER Reporter*. They will also appear at "Books in Progress" on the NBER's website.

Labor Market Intermediation

An NBER Conference on Labor Market Intermediation, organized by David Autor of NBER and MIT, took place in Cambridge on May 17 and 18. These papers were discussed:

Betsey Stevenson, University of Pennsylvania, “The Internet and Job Search”

Discussant: Ioana Marinescu, University of Chicago

Mauro Sylos Labini, IMT Lucca for Advanced Studies and University of Alicante, and **Manuel Bagues**, University Carlos III, Madrid, “Do On-Line Labor Market Intermediaries Matter? The Impact of AlmaLaurea on University-to-Work Transition”
Discussant: Anne Polivka, Bureau of Labor Statistics

Alice O. Nakamura, University of Alberta; **Amanda Pyman**; **Kathryn L. Shaw**, Stanford University and NBER; and **Richard B. Freeman**, Harvard University and NBER, “Jobs Online”
Discussant: Yannis M. Ioannides, Tufts University

Keith Finlay, University of California, Irvine, “Effect of Employer Access to Criminal History Data on the Labor Market Outcomes of Ex-Offenders and

Non-Offenders”
Discussant: David Autor

Woong Lee, University of California, Irvine, “Public Employment Offices and the Labor Market in the United States between 1890 and 1940”
Discussant: Susan Houseman, The Upjohn Institute

Richard Freeman, “Helping Workers Online and Offline: Union and Nonunion Organizations as Labor Market Intermediaries”
Discussant: Peter Cappelli, University of Pennsylvania

Muriel Niederle, Stanford University and NBER, and **Alvin E. Roth**, NBER and Harvard University, “The Effects of a Central Clearinghouse on Job Placement, Wages, and Hiring Practices: Gastroenterology Fellows as a Case Study”
Discussant: Richard Freeman

Morris M. Kleiner, University of Minnesota and NBER, and **Richard M. Todd**, Federal Reserve Bank of Minneapolis, “Does the Regulation of Mortgage Brokers Matter? Impacts on Wages, Employment, and Outcomes for Consumers”
Discussant: Alexandre Mas, University

of California, Berkeley and NBER

Michael Kvasnicka, Humboldt University of Berlin, “Does Temporary Help Work Provide a Stepping Stone to Regular Employment?”
Discussant: Elke Jahn, Harvard University

Rene Boheim, Johannes Kepler University, and **Ana Rute Cardoso**, IZA, “Temporary Agency Work in Portugal, 1995–2000”
Discussant: Jeffrey Smith, University of Michigan and NBER

Harry J. Holzer, Georgetown University; **Fredrik Andersson**, Bureau of the Census, and **Julia I. Lane**, University of Chicago, “Temporary Help Agencies and the Advancement Prospects of Low Earners”
Discussant: Yukako Ono, Federal Reserve Bank of Chicago

Carolyn J. Heinrich, University of Wisconsin-Madison; **Peter R. Mueser**, University of Missouri; and **Kenneth R. Troske**, University of Kentucky, “The Role of Temporary Help Employment in Low-wage Worker Advancement”
Discussant: Daniel Sullivan, Federal Reserve Bank of Chicago

Stevenson examines the effect of Internet job search on the U.S. labor market. Combining monthly CPS data, the CPS Computer Use Supplements, and proprietary data on Internet penetration, she documents how the availability of the Internet has changed job search methods, demonstrating that job search activity by the unemployed has increased. Looking at employment-to-employment transitions, she examines on-the-job search and finds that the Internet has led to greater mobility among jobs, particularly for those with more education. Workers who are online are 15 to 30 percent more likely to

change jobs than those who are not online, after controlling for observable worker and job characteristics. Similarly, workers who are online are 25 percent more likely to change jobs within the same firm. Among employed workers, employment-to-employment flows increase, particularly for those in the private sector with a college degree or higher.

Sylos Labini and **Bagues** empirically address the effects of on-line labor market intermediaries. In particular, they study the impact of the intermediation activity carried on by the inter-university consortium called AlmaLaurea on graduates’ labor

market outcomes. They argue that the existence of counterfactuals and the organizational features of AlmaLaurea allow them to overcome the problems faced by previous empirical investigations. Their evaluation is performed using the difference-in-differences method applied to a repeated cross section dataset. It is shown that, if the usual assumption concerning parallel outcomes holds, AlmaLaurea has a positive effect on individual unemployment probability and different measures of matching quality. Most interestingly, online intermediaries are shown to foster graduates’ geographical mobility.

Freeman put online an English language job search survey. The survey questions fall into five main groups: 1) demographic and education information; 2) work experience and current/recent employment status; 3) general job search experience; 4) computer access and Internet usage; and 5) internet job search usage. The survey instrument was advertised world wide using Google AdWords and the international AdBrite service. The enticement offered to encourage those who saw the ads to complete the survey was a promise that they would be entered in a drawing for \$1,000 U.S. A total of 1,602 useable survey forms were filled out by respondents 16 to 64 years of age. In this paper, **Nakamura** and her co-authors explore the responses obtained from the survey. It is often said and written that personal contacts are of greatest importance for finding employment. The respondents to the 2007 Job Search Survey mostly agree that personal contact and referrals are important, and networking and word of mouth are selected as important, too, by large percentages of the respondents. However, Internet recruitment sites are selected by even higher percentages in all of the age groups. More than three fourths of the job seekers in each age group indicated that Internet recruitment sites are useful for job search. The researchers are curious about whether those using job sites also check for work opportunities on employer web sites. They find that those with more education were especially likely to report using employer web sites to look for work.

Finlay examines how employer access to criminal history data influences the labor market outcomes of ex-offenders and non-offenders using detailed self-reported criminal history data and labor market variables from the 1997 cohort of the National Longitudinal Survey of Youth and a dataset he collected on state policies regarding criminal history records. Specifically, are the labor market effects of incarceration stronger and longer lasting in states that provide public access to criminal history records? Do non-offenders who are otherwise similar to ex-offenders have improved labor

market outcomes when employers can verify their records of non-offense? He tests if these effects vary by race in the context of possible statistical discrimination by employers. He finds evidence that employment effects of incarceration are more negative and last longer in states that provide criminal history records over the Internet than in states that do not. There is some evidence that ex-offenders have lower wages in those states with open records policies.

In the United States around the turn of the twentieth century, state and local governments began to establish public employment offices. These non-profit governmental organizations match businesses and job seekers. Their goals were to reduce search and information costs and to eliminate fraudulent activities by private employment agencies in the labor exchange. **Lee** estimates the usage and placements for job seekers through public employment offices in relation to the labor market conditions in order to explore the development of this labor market intermediary. He also estimates the geographical diffusion and the number of offices over time. In addition, he analyzes who used public employment offices. Finally, a theory of public employment offices is proposed to describe the situation which differs from that today.

How successful, if at all, have unions and nonunion groups been in delivering intermediary services to workers who lack collective bargaining contracts? Can unions or other groups create on-line communities that can complement or substitute for off-line worker groups to advance worker interests? **Freeman** seeks to answer these questions by analyzing innovative uses of the Internet by unions in the United States and the United Kingdom. He first lays out the challenge facing unions or other organizations in providing services outside of collective bargaining; he then reviews some of the major innovations in delivering services to workers outside of collective bargaining. Next he provides a detailed analysis of the Trade Union Congress's effort to build an on-line community of union activists (www.unionreps.org.uk) which he argues

is the union innovation that most fits the Internet era.

From 1986 through the late 1990s, new gastroenterologists participated in a labor market clearinghouse (a "match") after which the match was abandoned. This provided an opportunity to study the effects of a match, by observing the differences in the outcomes and organization of the market when a match was operating, and when it was not. After the GI match ended, programs hired fellows earlier each year, eventually almost a year earlier than when the match was operating. It became customary for GI program directors to make very short offers, rarely exceeding two weeks and often shorter. Consequently, many potential fellows had to accept positions before they finished their planned interviews, and most programs experienced cancellations of interviews they had scheduled. Furthermore, without a match, many programs hired more local fellows, and fewer from other hospitals and cities than they did during the match. Wages, however, seem not to have been affected. To restart the match, **Niederle** and **Roth** proposed a policy, subsequently adopted by the gastroenterology professional organizations, that even if applicants had accepted offers prior to the match, they could subsequently decline those offers and participate in the match. This made it safe for programs to delay hiring until the match, confident that programs that did not participate would not be able to "capture" the most desirable candidates beforehand. Consequently, it appears that most programs waited for the match in an orderly way in 2006.

Mortgage brokers are an emerging regulated occupation. Thirty years ago, there were almost no mortgage brokers, because individuals who wanted a mortgage dealt directly with a bank, a savings and loan, or a government-lending agency. With deregulation of financial services and major technology improvements that allowed for easy development and dissemination of credit scores and other financial records, lenders began to outsource the task of interacting with prospective borrowers. Today, about 60 per-

cent of all mortgages are initiated through a mortgage broker. Thirty years ago, no state regulated mortgage brokering firms or members of the occupation. Currently, all states except Alaska regulate the industry, and 18 states license the occupation by law. **Kleiner** and **Todd** have gathered all the principal laws and major administrative rulings covering the industry and occupation over the 1996–2006 period by date and type of statute and administrative procedure. They also have gathered information by state (and sometimes finer geographies) on foreclosures and, for 2005, prices of loans. In addition, they have data on the wages and employment of mortgage brokers and loan officers over a period that coincides with the information on regulatory statutes. Their preliminary exploration of the influence of regulation on mortgage broker markets finds that it had a small and usually insignificant impact on both labor market outcomes and on the quality of service provided to consumers in mortgage markets.

Based on administrative data from the federal employment service in Germany, **Kvasnicka** applies statistical matching techniques to estimate for unemployed job seekers the stepping-stone function of temporary help work to regular employment. His results show that workers who took temporary work within twelve months of unemployment registration in 1994–6 did not enjoy subsequent greater chances of employment outside of temporary help work over the next four years. Neither, however, did these workers suffer from future greater risks of unemployment. Quite to the contrary, they appeared significantly less likely to be unemployed. Moreover, they enjoyed higher chances of being in paid work throughout the four-year period they were followed in the data. While these results do not lend empirical support to a stepping-stone function of temporary help employment for the unemployed, neither do they confirm the existence

of adverse effects on the future regular employment and unemployment chances of unemployed job seekers. If anything, temporary help work appears to provide an access-to-work function for the unemployed in Germany.

Whereas there is widespread belief that workers in temporary work agencies (TWA) are subject to poorer working conditions, in particular pay, than comparable workers in the rest of the economy, there is little evidence on whether that is driven by the sector per se or by the workers' characteristics. **Boheim** and **Cardoso** first aim therefore to quantify the wage penalty, if any, for workers in TWA. Remarkable linked employer-employee data covering the whole private sector in Portugal enable them to account for observable as well as unobservable worker quality. The results suggest that workers in TWA are indeed subject to a wage penalty and that the major share of this penalty is associated with the attributes—both observable and unobservable—of the worker. If the authors control for the workers' observable and unobservable characteristics, they estimate that comparable workers receive 5 percent lower wages in TWAs than workers in all other firms. Once the TWA workers leave that sector and work elsewhere, their wages are not significantly different from those of other workers who switched jobs. The authors conclude that working for TWA does not lead to a stigma that lowers future wages.

Holzer and his co-authors use a very large matched database on firms and employees to analyze the use of temporary agencies by low earners, and to estimate the impact of temp employment on subsequent employment outcomes for these workers. Their results show that, while temp workers have lower earnings than others while working at these agencies, their subsequent earnings are often higher—but only if they manage to gain stable work with other employ-

ers. Furthermore, the positive effects seem mostly to occur because those working for temp agencies subsequently gain access to higher-wage firms than do comparable low earners who do not work for temps. The positive effects seem to persist for up to six years beyond the period during which the temp employment occurred.

Heinrich and her co-authors examine the effects of temporary help service (THS) employment on later earnings and employment for individuals participating in three federal programs providing supportive services to those facing employment difficulties. The programs include TANF, whose participants are seriously disadvantaged; a job training program, with a highly heterogeneous population of participants; and employment exchange services, whose participants consist of Unemployment Insurance claimants and individuals seeking assistance in obtaining employment. The researchers undertake their analyses for two periods: the late 1990s, a time of very strong economic growth, and shortly after 2000, a time of relative stagnation. Their results suggest that temporary help service firms may facilitate quicker access to jobs for those seeking employment assistance and impart substantial benefits as transitional employment, especially for individuals whose alternatives are severely limited. Those who do not move out of temporary help jobs, however, face substantially poorer prospects, and the authors observe that nonwhites are more likely than whites to remain in THS positions in the two years following program participation. These results are robust to program and time period.

These papers will be published by the University of Chicago Press in an NBER Conference Volume; its availability will be announced in a future issue of the *NBER Reporter*. They will also appear at "Books in Progress" on the NBER's website.

Universities Research Conference: Behavioral Corporate Finance

An NBER/Universities Research Conference on Behavioral Corporate Finance took place in Cambridge on May 18 and 19. Malcolm Baker, NBER and Harvard Business School, and Jeffrey Wurgler, NBER and NYU's Stern School of Business, organized this program:

Robin Greenwood, Harvard University, "Trading Restrictions and Stock Prices"
Discussant: Owen Lamont, Yale University and NBER

Salime Chahine, American University of Beirut; **Alexander Ljungqvist**, New York University; and **Roni Michaely**, Cornell University, "Marketing Financial Claims"
Discussant: Jay Ritter, University of Florida

Nicholas C. Barberis, Yale University and NBER, and **Ming Huang**, Cornell University, "Stocks as Lotteries: The Implications of Probability Weighting for Security Prices"

Todd Mitton and **Keith Vorkink**, Brigham Young University, "Why Do Firms With Diversification Discounts Have Higher Expected Returns?"
Discussant for both papers: Eli Ofek, New York University

Dirk Jenter, MIT and NBER; **Katharina Lewellen**, Dartmouth College, and **Jerold Warner**, University of Rochester, "Security Issue Timing: What Do Managers Know, and When Do They Know It?"
Discussant: **Ivo Welch**, Brown University and NBER

Francois DeGeorge, University of Lugano; **Jayendu Patel**, Choicestream; and **Richard J. Zeckhauser**, Harvard University and NBER, "Earnings Thresholds and Market Responses"
Discussant: Mark Bradshaw, Harvard University

Randall Morck, University of Alberta and NBER, "Behavioral Finance in Corporate Governance—Independent Directors and Non-Executive Chairs"

Discussant: Terry Burnham, Acadian Asset Management, Inc.

Simon Gervais, Duke University, and **Itay Goldstein**, University of Pennsylvania, "The Positive Effects of Biased Self-Perceptions in Firms"
Discussant: Augustin Landier, New York University

Itzhak Ben-David, University of Chicago; and **John R. Graham** and **Campbell R. Harvey**, Duke University and NBER, "Managerial Overconfidence and Corporate Policies"
Discussant: Ulrike Malmendier, University of California, Berkeley and NBER

Steven N. Kaplan, University of Chicago and NBER, and **Mark M. Klebanov** and **Morten Sorensen**, University of Chicago, "Which CEO Characteristics and Abilities Matter?"
Discussant: Kent Womack, Dartmouth College

Greenwood examines a series of stock splits in Japan in which firms restrict the ability of their investors to sell their shares for a period of approximately two months. By removing potential sellers from the market, the restrictions have the effect of increasing the impact of trading on prices. The greater is the desire of investors to trade, and the greater are the restrictions, the larger is the impact of the restrictions. In the data, particularly severe restrictions are associated with returns of over 30 percent around the ex-date, most of which are reversed when investors are allowed to sell again. Firms are more likely to issue equity or redeem convertible debt during the restricted period, suggesting strong incentives for manipulation.

Chahine, **Ljungqvist**, and **Michaely** examine a comprehensive set

of 524 pre-IPO analyst reports made available to investors and the broker's sales force in the course of marketing equity IPOs in France over the period 1991-2002. Exploiting exogenous variation in the behavior of affiliated and independent analysts caused by well-known conflicts of interest, they find that analyst reports are used to "hype" the issuer's stock in harder-to-place offerings and when more stock is reserved for allocation to retail investors. Moreover, retail (but not institutional) demand is stimulated by hype, and this demand boost in turn enables the underwriting bank to increase the offer price for the benefit of its corporate client. Over the first year of trading, hyped stocks underperform non-hyped stocks by a wide margin. These results underscore the marketing (as

opposed to information production) role of research analysts. They also suggest that analysts sometimes pander to certain psychological biases retail investors may be prone to, consistent with recent theoretical models.

Barberis and **Huang** study the asset pricing implications of Tversky and Kahneman's (1992) cumulative prospect theory, with particular focus on its probability weighting component. Their main result, derived from a novel equilibrium with non-unique global optima, is that, in contrast to the prediction of a standard expected utility model, a security's own skewness can be priced: a positively skewed security can be "overpriced," and can earn a negative average excess return. These results offer a unifying way of thinking about a number of seemingly

unrelated financial phenomena, such as the low average return on IPOs, private equity, and distressed stocks; the diversification discount; the low valuation of certain equity stubs; the pricing of out-of-the-money options; and the lack of diversification in many household portfolios.

A diversified firm can trade at a discount to a matched portfolio of single-segment firms if the diversified firm has either lower expected cash flows or higher expected returns than the single-segment firms. **Mitton** and **Vorkink** study whether firms with diversification discounts have higher expected returns in order to compensate investors for offering less upside potential (or skewness exposure) than focused firms. Their empirical tests support this hypothesis. First, they find that focused firms offer greater skewness exposure than diversified firms. Second, they find that diversified firms have significantly larger discounts when the diversified firm offers less skewness than matched single-segment firms. Finally, they find that up to 53 percent of the excess returns received on diversification-discount firms relative to diversification-premium firms can be explained by differences in exposure to skewness.

Jenter, Lewellen, and Warner study put option sales undertaken by corporations during their repurchase programs. Put sales' main theoretical motivation is market timing, providing an excellent framework for studying whether security issues reflect managers' ability to identify mispricing. The evidence is that these bets reflect timing ability, and are not simply a result of overconfidence. In the 100 days following put option issues, there is roughly a 5 percent abnormal stock price return, and the abnormal return is concentrated around the first earnings release date following put option sales. Longer-term effects are generally not detected. Put sales also appear to reflect successful bets on the direction of stock price volatility.

DeGeorge, Patel, and Zeckhauser (1999) show that companies manage

their earnings to meet or exceed three earnings targets: zero earnings, earnings reported four quarters ago, and analysts' earnings forecasts. In this paper, they extend the work along two lines. First, they document time and cross-sectional variation in threshold-regarding behavior. Second, they examine the market responses when earnings surpass thresholds, controlling for the earnings surprises. Their results suggest that investors view threshold crossing as an important indicator of the health of companies.

Corporate governance disasters often could be averted if directors asked hard questions, demanded clear answers, and blew whistles. Work in social psychology, by Milgram and others, suggests that humans have an innate predisposition to obey authority. This excessive subservience of agent to principal, which **Morck** here dubs a "type I agency problem", explains directors' eerie submission. He reviews rational explanations for it, but argues that behavioral explanations are more complete. Further behavioral studies reveal this predisposition to be disrupted by dissenting peers, conflicting authorities, and distant authorities. This suggests that independent directors, non-executive chairs, and committees composed of independent directors and excluding CEOs might induce greater rationality and more considered ethics in corporate governance. The empirical evidence for this is scant, though. This may reflect measurement problems, for many apparently independent directors may have hidden financial or personal ties to CEOs. But it also might reflect other behavioral considerations that reinforce agentic subservience to CEOs.

Many firms and organizations involve a team of agents in which the marginal productivity of any one agent increases with the effort of others. Because the effort of each agent is not observable to any other agent, the performance of the firm is negatively affected by a free-rider problem and a general lack of cooperation between

agents. In this context, **Gervais** and **Goldstein** show that an agent who mistakenly overestimates her own marginal productivity works harder, thereby increasing the marginal productivity of her colleagues who then work harder as well. This not only enhances firm performance and value but also may make all agents better off, including the biased ones. Indeed, although biased agents overwork, they benefit from the positive externality generated by other agents working harder. The presence of a leader improves coordination and firm value, but self-perception biases can never be Pareto-improving when they affect the leader. Self-perception biases also are shown to affect the likelihood and value of mergers, job assignments within firms, and compensation contracts.

Ben-David, Graham, and Harvey use a direct measure of overconfidence to test whether managerial overconfidence manifests itself in corporate policies. They collect a unique panel of over 6,500 quarterly stock market forecasts (expected returns, and the tenth and ninetieth percentiles of their perceived distributions) by Chief Financial Officers (CFOs) over a span of more than six years. On average, CFOs are miscalibrated: realized returns are within respondents' 80 percent confidence intervals only 40 percent of the time. After one controls for firm characteristics, the companies with overconfident CFOs (that is, CFOs with narrow confidence intervals) invest more, have higher debt leverage, pay out fewer dividends, use proportionally more long-term than short-term debt, engage in market timing activity, and tilt executive compensation towards performance-based bonuses. In addition, merger announcements by firms with overconfident CFOs are received negatively by investors.

Using a detailed dataset with assessments of CEO candidates for companies involved in private equity (PE) transactions, including both buyout (LBO) and venture capital (VC) deals, **Kaplan, Klebanov, and Sorensen** study

how CEOs' characteristics and abilities relate to hiring decisions, PE investment decisions, and subsequent performance. The candidates are assessed on more than 40 individual characteristics in seven general areas — leadership, personal, intellectual, motivational, interpersonal, technical and functional. In general, characteristics and abilities

are found to be highly correlated. For both LBO and VC firms, outside CEO candidates are more highly rated than insiders, and both LBO and VC firms are more likely to hire and invest in more highly rated and talented CEOs. Investors also value “soft” or team-related skills in the hiring decisions. However, these skills are not necessar-

ily associated with greater success. For LBO deals in particular, “hard” abilities and execution skills predict success. Finally, they find that insiders are no more likely to succeed than outside CEOs, holding observable talent and ability constant.

International Dimensions of Monetary Policy

An NBER Conference on “International Dimensions of Monetary Policy” brought together academic economists and monetary policymakers from several countries in Catalonia, Spain on June 11–13, 2007. Organizers Jordi Gali, NBER and Centre de Recerca en Economia Internacional, and Mark Gertler, NBER and New York University, chose the following papers for discussion:

Christopher Erceg, Christopher Gust, and **David Lopez-Salido**, Federal Reserve Board, “The Transmission of Domestic Shocks in Open Economies”
Discussant: Malin Adolfson, Bank of Sweden

Gunter Coenen, Giovanni Lombardo, Frank Smets, and Roland Straub, European Central Bank, “International Transmission and Monetary Policy Cooperation”
Discussant: Christopher Sims, Princeton University and NBER

Jean Boivin, HEC Montreal and NBER, and **Marc P. Giannoni**, Columbia

University and NBER, “Global Forces and Monetary Policy Effectiveness”
Discussant: Lucrezia Reichlin, European Central Bank

Olivier J. Blanchard, MIT and NBER, and **Jordi Gali**, “The Macroeconomic Effects of Oil Price Shocks: Why are the 2000s so Different from the 1970s?”
Discussant: Julio J. Rotemberg, Harvard University and NBER

Nicoletta Batini, IMF; **Paul Levine**, University of Surrey; and **Joseph Pearlman**, London Metropolitan University, “Monetary Rules in a Partially Dollarized Small Open Economy with Financial Market Imperfections”
Discussant: Frederic S. Mishkin, Federal Reserve Board and NBER

Andrea Ferrero, Federal Reserve Bank of New York; **Mark Gertler**; and **Lars E. O. Svensson**, Princeton University and NBER, “Current Account Dynamics and Monetary Policy”
Discussant: Paolo Pesenti, Federal

Reserve Bank of New York and NBER

Harald Uhlig, Humboldt University, “Monetary Policy in Europe vs the US: What Explains the Difference?”
Discussant: Andrew Levin, Federal Reserve Board

Argia Sbordone, Federal Reserve Bank of New York, “Globalization and Inflation Dynamics”
Discussant: Tommaso Monacelli, IGIER, Universita Bocconi

Giancarlo Corsetti, European University Institute; **Luca Dedola**, European Central Bank; and **Sylvain Leduc**, Federal Reserve Board, “Optimal Monetary Policy with Pricing to Market”
Discussant: Philippe Bacchetta, Study Center Gerzensee, Swiss Central Bank

Michael Woodford, Columbia University and NBER, “Globalization and Monetary Control”
Discussant: David H. Romer, University of California, Berkeley and NBER

Erceg and his co-authors use an open economy model to explore how trade openness affects the transmission of domestic shocks. For some calibrations, closed and open economies appear dramatically different, reminiscent of the implications of Mundell-Fleming style models. However, these

researchers argue that such stark differences hinge on calibrations that impose an implausibly high trade price elasticity, and Frisch elasticity of labor supply. Overall, their results suggest that the main effects of openness are on the composition of expenditure, and on the wedge between consumer and domestic

prices, rather than on the response of aggregate output and domestic prices.

Coenen and his co-authors use a version of the New Area-Wide Model developed at the European Central Bank to quantify the gains from monetary policy cooperation. The model is calibrated to match a set of empir-

ical moments. The researchers then derive the cooperative and (open-loop) Nash monetary policies, assuming that the central bank's objectives reflect the preferences of households. There are three main results in this paper. First, in line with the recent literature, the gains from cooperation are small in the benchmark model. They amount to about 0.03 percent of steady-state consumption. Second, decomposing the sources of the gains from cooperation with respect to the various shocks, it turns out that mark-up shocks are the most important source for gains from international monetary policy cooperation. Third, a sensitivity analysis with respect to various key parameters of the model suggests that the gains from cooperation become larger the more open is the economy.

Boivin and Giannoni quantify the changes in the relationship between international forces and many key U.S. macroeconomic variables over 1984–2005, and analyze changes in the monetary policy transmission mechanism. They do so by estimating a Factor-Augmented Variable Auto Regression on a large set of U.S. and international data series. They find that the role of international factors in explaining U.S. variables has been changing over this period. However, while some U.S. series have become more correlated with global factors, there is little evidence suggesting that these factors have become systematically more important. The authors don't find strong evidence of a change in the transmission mechanism of monetary policy because of global forces. Taking their point estimates literally, global forces do not seem to have played an important role in the U.S. monetary transmission mechanism between 1984 and 1999. In addition, since the year 2000, the initial response of the U.S. economy following a monetary policy shock — the first 6 to 8 quarters — is essentially that same as what has been observed in the 1984–1999 period. However, point estimates suggest that the growing importance of global forces might have contributed to

reducing some of the persistence in the responses, two or more years after the shocks. Overall, the authors conclude that if global forces have had an effect on the monetary transmission mechanism, this is a recent phenomenon.

Blanchard and Gali characterize the macroeconomic performance of a set of industrialized economies in the aftermath of the oil price shocks of the 1970s and the last decade, focusing on the differences across episodes. They examine four different hypotheses for the mild effects on inflation and economic activity of the recent increase in the price of oil: 1) good luck (offsetting shocks); 2) smaller share of oil in production; 3) more flexible labor markets; 4) improvements in monetary policy. They conclude that all four have played an important role.

Batini and her co-authors build a two-bloc emerging market-rest of the world model. The emerging market bloc incorporates partial transactions and financial dollarization, as well as financial frictions including a “financial accelerator”, where capital financing is partly or totally in foreign currency as in Gertler et al. (2003) and Gilchrist (2003). Simulations of the model under various “operational” monetary policy rules derived, assuming that the central bank maximizes households' utility, point to important results. First, the authors reaffirm the finding in the literature that financial frictions, especially when coupled with financial dollarization, severely increase the costs of a fixed exchange rate regime. By contrast, transactions dollarization has only a small impact on the choice of the monetary regime. Second, with dollarization and frictions, the zero lower bound constraint on the nominal interest rate makes simple Taylor-type rules perform much worse than fully optimal monetary policy rules.

Ferrero, Gertler, and Svensson explore the implications of current account adjustment for monetary policy within a simple two-country model. Their framework nests Obstfeld

and Rogoff's (2005) static model of exchange rate responsiveness to current account reversals. It extends this approach by endogenizing the dynamic adjustment path and by incorporating production and nominal price rigidities in order to study the role of monetary policy. They consider two different adjustment scenarios. The first is a “slow burn” where the adjustment of the current account deficit of the home country is smooth and slow. The second is a “fast burn” where, owing to a sudden shift in expectations of relative growth rates, there is a rapid reversal of the home country's current account. They examine several different monetary policy regimes under each of these scenarios. Their principal finding is that the behavior of the domestic variables (for instance, output, inflation) is quite sensitive to the monetary regime, while the behavior of the international variables (for instance, the current account and the real exchange rate) is less so.

Uhlig compares monetary policy in the United States and European Monetary Union during the last decade, using an estimated hybrid New Keynesian cash-in-advance model, driven by five shocks. It appears that the difference between the two monetary policies between 1998 and 2006 is attributable to both surprises in productivity and surprises in wage demands, moving interest rates in opposite directions in Europe and the United States, but not to a more sluggish response in Europe to the same shocks or to different monetary policy surprises.

Sbordone addresses the issue of how globalization may have affected the slope of the Phillips curve. Starting from the Calvo model of staggered price setting, she modifies some of its standard underlying assumptions in order to provide a channel for an increase in trade openness to affect the elasticity of inflation with respect to marginal costs. After qualitatively assessing the nature of the impact of trade openness, Sbordone evaluates whether the increase in the varieties of goods traded

since the beginning of globalization, as documented in the empirical literature, might have had a sizable negative impact on the component of the slope of the new Keynesian Phillips curve that relates domestic inflation to real marginal costs.

Corsetti and his co-authors reconsider the policy trade-offs created by stable import prices in local currency, which realistically result from both nominal rigidities and endogenous destination-specific markup adjustment by exporters. The main novelty of their model consists of placing price stickiness at the heart of strategic interactions between upstream producers and local firms. They show that price dispersion at the consumer level, attributable to staggered pricing decisions by local firms, affects the desired markup by upstream producers, magnifying their price response to shocks. The researchers solve for the optimal policy under cooperation, unveiling a reason

specific to the international dimension of the economy in support of price stability as the main prescription for monetary policy. As stable consumer prices feed back into a low volatility of markups among upstream producers, this contains inefficient deviations from the law of one price at the border.

Woodford considers three possible mechanisms through which it might be feared that globalization can undermine the ability of monetary policy to control inflation: by making liquidity premiums a function of global liquidity rather than the supply of liquidity by a national central bank alone; by making real interest rates dependent on the global balance between saving and investment rather than the balance in one country alone; or, by making inflationary pressure a function of global slack rather than a domestic output gap alone. He reviews the consequences of global integration of financial markets, final goods markets, and factor markets

and finds that globalization, even of a much more thorough sort than has yet occurred, is unlikely to weaken the ability of national central banks to control the dynamics of inflation.

The conference also included a panel discussion on “International Dimensions of Monetary Policy.” The panelists were: NBER President Martin Feldstein of Harvard University; Donald Kohn, Vice Chairman of the Federal Reserve Board of Governors; Laurence H. Meyer, former governor of the Federal Reserve Board and currently of Macroeconomic Advisers; Lucas Papademos, Vice President of the European Central Bank; and Carlos Sales, Deputy Governor, Bank of Spain.

The University of Chicago Press expects to publish these papers and discussions in an NBER Conference Volume. Its availability will be announced in a future issue of the *NBER Reporter*.



International Seminar on Macroeconomics

The NBER's 30th Annual International Seminar on Macroeconomics, organized by Richard C. Clarida, NBER and Columbia University, and Francesco Giavazzi, NBER and Bocconi University, took place in Istanbul on June 15–16. Jeffrey A. Frankel, NBER and Harvard University, and Francesco Giavazzi served as co-chairs. These papers were discussed:

“Interest-Setting and Central Bank Transparency” — **Pierre Gosselin**, **Aileen Lotz**, and **Charles Wyplosz**, University of Geneva
Discussants: Charlie Bean, Bank of England, and Michael D. Woodford, Columbia University and NBER

“Expectations, Monetary Policy, and the Misalignment of Traded Goods Prices” — **Charles Engel**, University of Wisconsin and NBER, and **Michael B. Devereux**, University of British Columbia
Discussants: Gianluca Benigno, London School of Economics, and Argia Sbordonè, Federal Reserve Bank of New York

“Public Investment and the Golden Rule: Another (Different) Look” — **Roberto Perotti**, Bocconi University and NBER
Discussants: Erdem Basci, Central Bank of Turkey, and Kenneth D. West, University of Wisconsin and NBER

“Financial Integration within EU Countries: The Role of Institutions, Confidence, and Trust” — **Mehmet Fatih Ekinci**, University of Rochester; **Sebnem Kalemlı-Ozcan**, University of Houston and NBER; and **Bent E. Sorensen**, University of Houston
Discussants: Philip Lane, Trinity College Dublin, and Enrique G. Mendoza, University of Maryland and NBER

“International Portfolios with Supply, Demand, and Redistributive Shocks” — **Nicolas Coeurdacier**, ESSEC Business School; **Robert Kollmann**, ECARES, Université Libre de Bruxelles; and **Philippe Martin**, Paris School of Economics
Discussants: Fabio Ghironi, Boston College and NBER, and Refet Gurkaynak, Bilkent University

“The Simple Geometry of Transmission and Stabilization in Closed and Open Economies” — **Paolo Pesenti**, Federal Reserve Bank of New York and NBER, and **Giancarlo Corsetti**, European University Institute
Discussants: Richard D. Clarida and Jeffrey A. Frankel

“Capital Flows and Asset Prices” — **Kosuke Aoki**, **Gianluca Benigno**, and **Nobuhiro Kiyotaki**, London School of Economics
Discussants: Andrew Haldane, Bank of England, and Sebnem Kalemlı-Ozcan

“On the Welfare Implications of Financial Globalization without Financial Development” — **Enrique G. Mendoza**, **Vincenzo Quadrini**, University of Southern California and NBER; and **Jose-Victor Rios-Rull**, University of Pennsylvania and NBER
Discussants: Giancarlo Corsetti, and Mehmet Yorukoglu, Central Bank of Turkey

Gosselin and his co-authors extend the recent literature on central bank transparency by noting that most central banks now publish their interest rates. As a consequence, central banks cannot hide all of their information; they must reveal some of it as they set and publish the interest rate. These researchers study the role of transparency in the presence of the distortionary common knowledge effect emphasized by Morris and Shin (2002). Publishing the interest rate implies that the central bank becomes the source of such a distortion. The question, then, is whether additional information is desirable. The answer depends not just on the relative precision of central bank information but also on what is known of this precision. The authors find that

the interest rate can be used by the central bank to offset the common knowledge effect. Transparency, which undermines the information content of the interest rate, tends to undermine its strategic use. They also find that uncertainty about private sector information precision leads to monetary policy mistakes that become the source of price volatility. Transparency helps to reduce this volatility.

Nominal exchange rates are asset prices — they are the relative price of two moneys — and are determined largely by expected future macroeconomic conditions. When some goods prices are sticky in each currency, exchange rate changes also determine changes in the relative prices of goods. There is a sticky-price distortion, since

freely set relative goods prices do not in general act like the relative price of two moneys. Large nominal exchange rate swings, reflecting expectations of the future, can lead to substantial misalignments in prices, even flexible commodity prices, when some nominal prices are sticky. In a series of stylized models, **Devereux** and **Engel** examine the implications for monetary policy.

Using a structural Vector Autoregression approach, **Perotti** compares the macroeconomic effects of the two components of government purchases of goods and services: government consumption and government investment. He studies both the size and the speed of their effects on GDP and its components. Contrary to common opinion, there is no evidence that government

investment shocks are more effective than government consumption shocks in boosting GDP: this is true both in the short and, perhaps more surprisingly, in the long run. In fact, government investment appears to crowd out private investment. And, there is no evidence that government investment “pays for itself” in the long run, as proponents of the “Golden Rule” implicitly or explicitly argue. Defense purchases have even smaller (or negative) effects on GDP and private investment.

Ekinci and his co-authors investigate the degree of financial integration within European countries. They construct two measures of de facto integration across European regions to capture “diversification” and “development” finance in the language of Obstfeld and Taylor (2004). They find that capital market integration within the EU is less than what is implied by theoretical benchmarks and less than what is found for U.S. states. Why is this the case? Using data from the World Value Surveys, the authors investigate the effect of “social capital” on financial integration among European regions controlling for the effect of country level institutions. They find that regions where the level of confidence and trust is high are more financially integrated with each other.

Coeurdacier and his co-authors seek to understand three stylized facts observed in industrialized countries: 1) portfolios are biased toward local equity; 2) international portfolios are

long in foreign currency and short in domestic currency; 3) valuation effects are such that an exchange rate depreciation is associated to a positive transfer of wealth. They build a two-country, two-good model with stocks and bonds where uncertainty is not only attributable to productivity shocks but also to shocks on the distribution of income between labor and capital, and to demand shocks. They show that, in this case, optimal portfolios are broadly consistent with these stylized facts. They perform the analysis in situations of both complete and incomplete markets.

Pesenti and **Corsetti** provide a graphical introduction to the recent literature on macroeconomic stabilization in closed and open economies. Among the issues they discuss are: international transmission of real and monetary shocks and the role of exchange rate pass-through; optimal monetary policy and the welfare gains from macroeconomic stabilization; and monetary coordination among interdependent economies.

Aoki and his co-authors construct a model of small open economy in which it is difficult to insist that debtors repay debt unless it is secured by collateral, and where assets and projects usable as collateral for international borrowing are more restricted than for domestic borrowing. Using this model, they analyze how adjustment to capital account liberalization depends upon the degree of development of domes-

tic financial institutions. They show that asset prices importantly affect the dynamic adjustment of output and total factor productivity during the adjustment process. They also analyze why the economy with underdeveloped financial systems may be vulnerable to shocks to the condition of domestic and foreign credits.

It is widely argued that countries can reap large gains from liberalizing their capital accounts if financial globalization is accompanied by the development of domestic institutions and financial markets. However, if liberalization does not lead to financial development, globalization can result in adverse effects on social welfare and the distribution of wealth. **Mendoza** and his co-authors use a multi-country model with non-insurable idiosyncratic risk to show that, if countries differ in the degree of asset market incompleteness, financial globalization will hurt the poor in countries with less developed financial markets. This is because in these countries liberalization leads to an increase in the cost of borrowing, which is harmful for the poor because they have larger liabilities relatively to their assets. The quantitative analysis shows that the welfare effects are sizable and can justify policy intervention.

The MIT Press will publish these papers in an annual conference volume later this year. They are also available at “Books in Progress” on the NBER’s website.

Frontiers in Health Policy Research

The NBER's ninth conference on "Frontiers in Health Policy Research" took place in Washington, DC on June 20. NBER Research Associates David M. Cutler of Harvard University, Alan M. Garber of Stanford University, and Dana Goldman of RAND, organized the meeting. These papers were presented:

Frank R. Lichtenberg, Columbia University and NBER, "Pharmaceutical Innovation and U.S. Cancer Survival in the 1990s: Evidence from Linked SEER-MEDSTAT Data"

William H. Dow, University of California, Berkeley and NBER, "Risk Adjusted Subsidies for the Chronically Ill"

Ellen Meara and **Katherine Baicker**, Harvard University and NBER; and **Anna D. Sinaiko** and **Meredith Rosenthal**, Harvard University; "State and Federal Approaches to Health Reform: What Works for the Working Poor?"

M. Kate Bundorf and **Victor R. Fuchs**,

Stanford University and NBER, "Public Support for National Health Insurance: The Roles of Attitudes and Beliefs"

Joseph P. Newhouse, Harvard University and NBER, and **Anna D. Sinaiko**, "Can Multi-Payer Financing Achieve Single-Payer Spending Levels?"

Dave M. O'Neill, Baruch College, CUNY, and **June O'Neill**, Baruch College, CUNY and NBER, "Health Care Services and Health Status: Canada vs. the U.S."

Lichtenberg examines the impact of pharmaceutical innovation and other factors on the survival of U.S. cancer patients during the 1990s. In particular, he investigates whether cancer survival rates increased more for those cancer sites that had the largest increases in the proportion of drug treatments that were "new" treatments. He controls for "expected survival," that is the survival of a comparable set of people that did not have cancer, thereby measuring the excess mortality that is associated with a cancer diagnosis. He also controls for other types of medical innovation, such as innovation in surgical procedures, diagnostic radiology procedures, and radiation oncology procedures. Data on observed and expected survival rates, the number of people diagnosed, mean age at diagnosis, and stage distribution come from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) 1973–2003 Public-use Data. Estimates of rates of innovation in drugs and other treatment and diagnostic procedures were constructed from the MED STAT MarketScan database and other data sources. He computes weighted least-squares estimates of 12 versions of a survival model, based on different survival intervals, functional forms, and sets of weights. The drug vintage coefficient is positive and significant in almost every

model. This indicates that the cancer sites whose drug vintage (measured by the share of post-1990 treatments) increased the most during the 1990s tended to have larger increases in observed survival rates, *ceteris paribus*. Estimates of the fraction of the 1992–9 change in the observed survival rate attributable to the increased use of post-1990 drugs range from 12 percent to 121 percent. The estimated fraction is higher for shorter survival intervals, when observations are weighted by the number of MEDSTAT drug treatments, and for the logarithmic specification. The mean of the 12 estimates of the fraction of the 1992–9 change in the observed survival rate attributable to the increased use of post-1990 drugs is 44 percent. Because of sampling and other measurement errors, these estimates may be conservative. The coefficients on measures of other types of medical innovation (in radiation oncology, diagnostic radiology, and surgery innovation) are generally not significant. However, these measures may be less reliable than the drug innovation measure: they are based upon the year in which the AMA established a new procedure code, which may be a far less meaningful indicator of innovation than the year in which the FDA first approved a drug. This topic warrants further research.

Government-sponsored health reinsurance increasingly has been promoted

as a strategy for addressing problems in the non-group health insurance market. While reinsurance is promising, economic analysis has identified superior schemes for better accomplishing the same goals at lower cost. Specifically, reinsurance can be considered a crude special case of risk-adjusted insurance subsidies. **Dow** considers economic benefits and budgetary costs of reinsurance schemes as compared to more sophisticated risk-adjustment, calibrated to the current U.S. context. In particular, risk adjustment is likely to perform better at reducing insurer cream-skimming incentives. Although in the past risk adjustment had been considered too complex to implement in practice, recent experience shows that risk adjustment is now feasible, and he argues that incorporation of risk adjustment would strengthen many current U.S. health insurance reform proposals.

Policies designed to expand insurance coverage may have very different implications beyond the number of newly insured, particularly among the working poor. These broader effects include employment, wages, and the distribution of costs and benefits across families. **Meara** and her co-authors compare the likely effects of three common approaches to covering the uninsured: public insurance expansions, refundable tax credits for low-income people, and employer and

individual mandates. The most common approaches being pursued by the states are likely to miss a large share of the uninsured working poor. Approaches that expand coverage most broadly have potentially significant negative labor market consequences, while market-based approaches redistribute dollars but insure relatively few. Policymakers must consider the full range of economic costs when designing health insurance expansions.

Despite numerous attempts to enact legislation throughout the twentieth century, the United States is the only developed country without a system of national health insurance. Yet, public opinion polls over the last 20 years consistently find that a solid majority of Americans support national health insurance. **Bundorf** and **Fuchs** examine the relationship between public support for national health insurance and attitudes toward different roles of government and individual beliefs. They find that people who have favorable attitudes toward government economic intervention and government redistribution are more likely to favor national health insurance than those who have less favorable attitudes toward these roles of government. The most intense support for national health insurance is among those who have favorable attitudes toward both roles of government. Consistent with research about other social programs, the authors find that the beliefs regarding racial minorities, as well as beliefs regarding individual control over life, limit support for national health insurance in the United States. On the other hand, negative beliefs regarding

businesses are an important source of support for national health insurance.

Many believe the high level of U.S. health care costs compared with other countries is attributable to high administrative costs inherent in our pluralistic health care system. Instead of the usual statistics examining percentage of GDP that various countries spend on health care, **Newhouse** and **Sinaiko** show the percentage of Gross State Product that various states spend on health care. Even adjusting for age and income, there is considerable variation across the states in spending levels, with the lowest quintile of states spending approximately the same percentage as the higher spending OECD countries other than the United States. Although a single-payer system may be a sufficient condition to spend at these levels, it is not a necessary condition.

It is often presumed that a publicly funded, single payer health care system like Canada's will deliver better health outcomes and distribute health resources more equitably than the multi-payer, largely private system in the United States. This judgment has been bolstered by comparisons of life expectancy and infant mortality, two measures on which Canada scores higher than the United States. However, both measures are influenced by factors unrelated to the quality or accessibility of medical care (for example, the relatively high teen birth rate in the United States — 2.8 times higher than the Canadian rate — contributes to the differential in infant mortality because teen births are more likely to be high risk-preterm and low weight). Thus, the effi-

cacy of the two health care systems cannot be usefully evaluated by comparisons of the two popular measures. **O'Neill** and **O'Neill** use a unique dataset that was designed to enable comparisons of health outcomes and access to health resources in Canada and the United States. Based on their analysis of these data (The Joint Canada/U.S. Survey of Health), they find a somewhat higher incidence of chronic health conditions in the United States, combined with evidence of greater access to health treatments for those conditions. Moreover, with respect to preventive care, a higher percentage of U.S. than Canadian women receive cancer screening in the form of mammograms and pap smears. Health status, measured in various ways is similar in both countries. But Canada has no more abolished the tendency for health status to improve with income than have other countries. Indeed, the health-income gradient is slightly steeper in Canada than it is in the United States, even after adjusting for education and other variables related to income. The need to ration when care is delivered "free" ultimately leads to unmet needs because of long waits or unavailable services. In the United States, costs are more often a source of unmet needs. But costs may be more easily overcome than the absence of services. When asked about satisfaction with health services and the ranking of the quality of services recently received, a significantly higher percentage of U.S. residents than Canadians respond that they are very satisfied with services and rank quality of care received as excellent.

Eighteenth Annual EASE Conference

The NBER, the University of Tokyo, the China Center for Economic Research, the Chung-Hua Institution for Economic Research, the Hong Kong University of Science and Technology, the Korea Development Institute, the Productivity Commission of Australia, the Singapore Management University, and the Tokyo Center for Economic Research jointly sponsored the NBER's 18th Annual East Asian Seminar on Economics on June 22–24. Takatoshi Ito, University of Tokyo and NBER, and Andrew K. Rose, University of California, Berkeley and NBER, organized the conference, which focused on “Financial Sector Development in the Pacific Rim.” These papers were discussed:

Kaoru Hosono, Gakushuin University; **Koji Sakai**, Hitotsubashi University; and **Kotaro Tsuru**, RIETI, “Consolidation of Banks in Japan: Causes and Consequences”
Discussants: Hiro Ito, Portland State University, and Barry Williams, Bond University

Masaya Sakuragawa and **Yoshitsugu Watanabe**, Keio University and TCER, “Did the Japanese Stock Market Appropriately Price the Takenaka Financial Reform?”
Discussants: Takatoshi Ito, and Randall Morck, University of Alberta and NBER

Robert N. McCauley and **Eric Chan**, Bank for International Settlements, “Hong Kong and Shanghai: Yesterday, Today and Tomorrow”
Discussants: David Cook, Hong Kong University of Science and Technology,

and Susan Wachter, University of Pennsylvania

Chang-Gyun Park, Chung-Ang University, “Consumer Credit Market in Korea since the Economic Crisis”
Discussants: Chin Hee Hahn, Korea Development Institute, and Winston Koh, Singapore Management University

Youngjae Lim, Korea Development Institute, “Stock Market Development, Corporate Restructuring, and Corporate Governance in Post-Crisis Korea”
Discussants: Robert McCauley, and Chung-Hua Shen, National Chengchi University

Richard Green, George Washington University; **Roberto Mariano**, Singapore Management University; and **Andrey Pavlov** and **Susan Wachter**, University of Pennsylvania, “Mortgage Securitization in Asia: Gains and Barriers”
Discussants: Michael Davies, Reserve Bank of Australia, and Mario Lamberte, ADBI

Chung-Hua Shen and **Mei-Rong Lin**, National Chengchi University, “The Determinants of Cross-Border Merger and Acquisition Activity in the Banking Sector in Asia: Did the Asian Financial Crisis Change Them?”
Discussants: Mario Lamberte, and Wimboh Santoso, Bank Indonesia

Takeo Hoshi, University of California, San Diego and NBER; **Yasushi Hamao**, University of Southern California; and **Tetsuji Okazaki**, University of Tokyo, “Listing Policy and Development of the

Tokyo Stock Exchange in the Pre-War Period”

Discussants: Youngjae Lim, Korea Development Institute, and Masaya Sakuragawa, Keio University and TCER

Kathy Fogel, Northern Kentucky University; **Randall Morck**; and **Bernard Yeung**, New York University, “Big Business Stability and Economic Growth: Is Whats Good for General Motors Good for America?”
Discussants: Partha Chatterjee, National University of Singapore, and Pushan Dutt, INSEAD

Ho-Mou Wu and **Yu Zhang**, China Center for Economic Research, “Merger Activities and Stock Market Valuation in China”
Discussants: Kaoru Hosono, Gakushuin University, and Julian Wright, National University of Singapore

Menzie D. Chinn, University of Wisconsin and NBER, and **Hiro Ito**, Portland State University, “East Asia and Global Imbalances: Saving, Investment, and Financial Development”
Discussants: Edwin Lai, Singapore Management University, and Edward Robinson, Monetary Authority of Singapore

Jan-Egbert Sturm, KOF Swiss Economic Institute, and **Barry Williams**, “What Determines Differences in Foreign Bank Efficiency? Australian Evidence”
Discussants: Menzie D. Chinn and Andrey Pavlov

Using a comprehensive dataset, **Hosono** and his co-authors investigate the motives and consequences of the consolidation of banks in Japan during the fiscal years 1990–2004. Their analysis suggests that regulators’ attempts at stabi-

lizing the local financial market through consolidations played an important role in the mergers and acquisitions (M&As) conducted by regional banks or credit corporative (*shinkin*) banks, although their attempt does not seem to have been

successful. Value maximization motives also seem to have driven the M&As conducted by major banks and regional banks in the early 2000s. The researchers find no evidence supporting managerial motives for empire building.

Using event study methodology, **Sakuragawa** and **Watanabe** ask how the stock market evaluated Japanese financial reform—the so-called “Takenaka Plan.” They examine how market participants perceived three important events that occurred in 2003: the release of a package of monetary policies initiated by Fukui, the new governor of BOJ, as well as the failures of Risona Bank and Ashikaga Bank. The response of Japanese banks’ stock market returns to the failures of Risona and Ashikaga Banks reveals that bank shareholders differentiate individual banks by their financial conditions, as targeted for disciplinary purposes by the Takenaka Plan. The response to the monetary package, however, shows no evidence of differentiating banks by individual conditions.

At some point in the not too distant future, China will ease its capital controls and make the yuan renminbi fully convertible into foreign currencies. Shortly after that, Shanghai will re-emerge as an international financial center. What then will become of Hong Kong, an established financial center now? **McCauley** and **Chan** argue that Hong Kong will gain stature as an international financial center when China is more open financially and Shanghai returns as a competing center. This thesis is in the tradition of Kindleberger (1974), who argued that federal states can support more than one financial center. The thesis that the development of an onshore international financial center can contribute to the development of a nearby offshore international financial center is in some ways the inverse of that of Rose and Spiegel (2006), who argue that offshore competition can spur the onshore center.

Park documents the rapid growth of household credit in Korea since the foreign exchange crisis of 1997 and the development of a credit card crisis in 2003, then evaluates the adequacy of policy responses to both. The increase in household debt was primarily the result of financial deregulation and a paradigm shift in the financial industry. The new principle adopted by financial institutions after deregulation was mainly to

emphasize resource allocation based on market mechanisms. The deregulation of the financial industry after the foreign exchange crisis was not an exception to this, in the sense that it was accompanied by a boom in the financial market that eventually resulted in a violent crash landing. Park discusses the development of the credit card crisis presuming that it was a classic example of regulatory failure. He argues that, with timely and proper regulatory actions, much of the difficulty inflicted by the credit card crisis would have been alleviated, if not averted.

Lim notes that the mechanisms for corporate restructuring are significantly different depending upon whether the financial system of the economy is “bank-based” or “stock market-based.” In the bank-based system, corporate control remains within the firms. Only in the case of (near) bankruptcy is corporate control transferred to banks. In the stock market-based financial system, on the other hand, the owners or management of the firms have to share corporate control with outside investors in the market. This activation of the market for corporate control is exactly the key to corporate restructuring. Before the financial crisis in 1997, Korea’s financial system was mainly bank-based. The financial crisis itself meant a collapse of that system. After the crisis, the Korean government made extensive reform efforts to improve the financial system: enhancing the workings of the banking system and the capital market. Since then, Korea has been moving away from a bank-based financial system towards a stock market based system. In particular, in the Korean stock market, foreign investors have been increasing their shares (of large blue-chip firms). This exposure of corporate control to outside competition has a significant impact on the behavior of (large) firms. Since large firms are mostly affiliated with big business groups, cross shareholdings within the groups increase significantly. In addition, the ownership structure within the group changes to enhance the control on affiliated firms.

Green and his co-authors provide a conceptual basis for the price discovery potential of tradable market instru-

ments and, specifically, for the development of mortgage securitization in Asia. Securitization in Asia, they argue, is particularly important because of its potential role in increasing the transparency of the financial sector of Asian economies. The authors put forth a model explaining how misaligned incentives can lead to bank generated real estate crashes and to macroeconomic instability. They examine the banking sector’s performance in Asia compared to securitized real estate returns, in order to provide evidence on the contribution of misaligned incentives. They discuss how the addition of mortgage-backed securities (MBS) helps to inoculate markets from the shocks arising from bank-financed mortgage lending. They conclude with a brief discussion of current MBS markets in Asia.

Shen and **Lin** study the motivation that drives financial institutions to engage in cross-border M&A activity in ten Asian countries before and after the 1997 financial crisis. Five hypotheses are examined: the “gravity hypothesis”; the “following the client hypothesis”; the “market opportunity hypothesis”; the “information cost hypothesis”; and the “regulatory restriction hypothesis.” Each hypothesis includes two or three proxies and therefore results are better interpreted based on the proxies. The results suggest that although the “client hypothesis” and the “regulatory restriction hypothesis” are applicable for both periods, the “information cost hypothesis” is only supported after the Asian crisis.

Recent studies have established that the Japanese stock market was quite large in the pre-war period and played an important role in financing economic development. However, the pre-war stock market in Japan did not achieve its size and status quickly. Indeed, market capitalization remained relatively small during the early years of stock market development in Japan. **Hamao** and his co-authors study the pre-war development of the Tokyo Stock Exchange (TSE), which eventually grew to be one of the two largest stock exchanges in pre-war Japan. They ask why the development was rather stagnant between its establishment in 1878

and the 1910s, and what led to its take-off in the late 1910s. They argue that the TSE stayed small because low liquidity discouraged new companies from listing their stocks. The lack of growth in newly listed stocks meant that liquidity continued to be low until 1918, when the TSE changed its policy to start listing companies without waiting for their listing applications. They provide empirical evidence from the listing behavior of cotton spinning firms showing that the size of the market indeed mattered for their listing decision before 1918.

What is good for a country's biggest businesses is not good for its overall economy, at least in the late twentieth century. More turnover in a country's list of top ten businesses between 1975 and 1996 is associated with faster per capita GDP growth, productivity growth, and (in low income countries) capital accumulation. This accords with Schumpeter's early concept of creative destruction, wherein growth is a positive feedback process of innovative firms blooming as stagnant firms wither. However, **Fogel, Morck, and Yeung** find that growth correlates with old big businesses declining and disappearing, not just new ones arising, which seems more consistent with creative destruction than with other theories of economic growth. Consistent with Aghion and Howitt's (1992) theory that creative destruction matters more to economies nearer the technological frontier, growth correlates more strongly with big business turnover in higher income countries. More rapid turnover of big business also correlates with smaller government, Common Law, a less bank-dependent economy, stronger shareholder rights, and greater openness. Only the last is more prominent in low than high-income countries. In low income countries, the turnover of one-time state controlled big businesses correlates markedly with growth.

Merger activities have been growing significantly in China's stock markets in recent years. Adopting the event-study method and accounting method (financial indicators method), **Wu and Zhang** examine 752 merger and acquisition events involving 587 companies traded on Shanghai and Shenzhen stock exchanges in 2005. They find that within the event period (-50 days, 40 days), M&A companies' values were increased. The CAR (Cumulative Abnormal Return) of all M&A firms within the event period was 1.74 percent; for acquiring firms and target firms, the CAR were respectively 1.68 percent and 2.03 percent. They also examine whether M&A types, M&A companies' industries, ownership structures (the types of controlling shareholders), and the stock market's aggregate performance can have effects on the returns to M&A events. Analyzing accounting indicators within a longer observation period (four years), they find that the financial conditions of M&A companies showed a certain degree of decline in the first year of M&A, but an obvious improvement in the following year. However, the short-term and long-term ability to repay debt declined without a clear sign of improvement after the merger.

Chinn and Ito investigate the role of budget balances, financial development, and openness in the evolution of global imbalances. Financial development—or the lack thereof—has received considerable attention as a possible contributing factor to the development of persistent and expanding current account imbalances. Several observers have argued that the depth and sophistication of U.S. capital markets have caused capital to flow from relatively underdeveloped East Asian financial markets. Here the authors extend their previous work by examining the effect of *different types and aspects* of financial development. Their cross-

country analysis, encompassing a sample of 19 industrialized countries and 70 developing countries for the period 1986 through 2005, yields a number of new results. First, they confirm a role for budget balances in industrial countries when bond markets are incorporated. Second, empirically, both credit to the private sector and stock market capitalization appear to be equally important determinants of current account behavior. Third, while increases in the size of financial markets induce a decline in the current account balance in industrial countries, the reverse is more often the case for developing countries, especially when other measures of financial development are included. However, because of nonlinearities incorporated into the specifications, this characterization is contingent. Fourth, a greater degree of financial openness is typically associated with a smaller current account balance in developing countries.

Sturm and Williams examine the factors that determine differences in efficiency of foreign banks in the host market (Australia). They consider the impact of home market, host market, and parent bank characteristics, within the frameworks offered by comparative advantage and new trade theories. They also use parametric distance functions to estimate the efficiency of foreign banks in Australia, and they test the robustness of model specification using both general-to-specific modelling and extreme-bounds analysis. They find that following clients reduces the efficiency of profit creation. Incumbent bank's market share acts as a barrier to entry, while parent bank profits do not improve host nation efficiency. The limited global advantage hypothesis is relevant for banks from the United Kingdom, while banks from the United States were generally less efficient.

NBER Conference in Beijing

The ninth annual NBER-CCER Conference on China and the World Economy took place at the China Center for Economic Research (CCER) in Beijing on June 27–30. The conference program was jointly arranged by the National Bureau of Economic Research, the CCER at Beijing University, and Tsinghua University.

At this conference, the discussion topics presented by Chinese participants included: the relationship between trade, foreign direct investment, and technological upgrades in China; measurements of the return to capital in China; how

entrepreneurship will influence China's growth; Chinese energy policy and the environment; healthcare reforms in China; and, how aging of China's population will affect economic development.

U.S. participants at this year's conference were: NBER President Martin Feldstein, and Professor Shang-Jin Wei of Columbia University and NBER, both serving as the U.S. conference organizers; NBER researchers Kristin Forbes of MIT, Douglas A. Irwin of Dartmouth College, Kathleen M. McGarry of University of California at Los Angeles, Gilbert E. Metcalf of Tufts University, Alvin E. Roth

of Harvard University, Scott Stern of Northwestern University, and Mark W. Watson of Princeton University. They discussed: the lessons from history regarding trade policy; the impact of patents on scientific research; international business cycle dynamics; energy policy and the environment; health insurance and health care; and the economics of kidney exchange.

The entire conference program with links to other related information is available on the NBER's web site at www.nber.org/china.

NBER News

Bernanke Speaks at NBER's Summer Institute

Federal Reserve Board Chairman Ben S. Bernanke spoke to the NBER's Summer Institute in Cambridge on July 10. Bernanke, formerly an academic himself who taught at Princeton, was an NBER Research Associate from 1994 to 2002, and served as Director of the NBER's Monetary Economics Program. He began his remarks by noting: "The

informal nature of the NBER Summer Institute, the large number of talented people in attendance, and the opportunity to hear about the very latest work in the field—often while in early draft form—made these few weeks each summer one of the most stimulating times of the year for me. In my current position, I am keenly aware of the long history of

fruitful interaction between economists inside and outside of central banks, and I am eager to see this interaction continue. This ongoing intellectual exchange, by improving our understanding of the economy and the workings of monetary policy, has had and will continue to have sizable benefits."

Finkelstein is 2007/8 Griliches Fellow

Amy N. Finkelstein, an NBER Faculty Research Fellow in the Public Economics, Aging, and Health Care Programs and an associate professor of economics at MIT, has been selected to receive the Zvi Griliches Fellowship at the NBER for the academic year 2007/8. This fellowship, which is awarded every two years, was created and funded by friends and colleagues

of Professor Griliches to honor his memory and his tradition of mentoring young empirical economists.

Finkelstein's research is directed toward market failures and government intervention in insurance markets, and the impact of public policy on the health care sector, particularly on the development and diffusion of medical technol-

ogy. She plans to spend her fellowship year at the NBER's Cambridge office studying the costs and benefits of offering choice within social insurance programs, and the determinants of rising health care spending.

Finkelstein received her A.B. in government from Harvard University and her Ph.D. in Economics from MIT.

Program and Working Group Meetings

International Trade and Investment

The NBER's Program on International Trade and Investment met in Cambridge on March 30 and 31. NBER Faculty Research Fellow Lee G. Branstetter of Carnegie Mellon University organized the program. These papers were discussed:

Devashish Mitra, Syracuse University and NBER, and **Priya Ranjan**, University of California, Irvine, "Offshoring and Unemployment"

Andres Rodriguez-Clare, Pennsylvania State University and NBER,

"Offshoring in a Ricardian World"

Nikolaj Malchow-Moller and **Bertel Schjerning**, CEPR, and **James R. Markusen**, University of Colorado, Boulder and NBER, "Foreign Firms, Domestic Wages"

Richard Baldwin, University of Geneva and NBER, and **James Harrigan**, Federal Reserve Bank of New York and NBER, "Zeros, Quality, and Space: Trade Theory and Trade Evidence"

Alla Lileeva, York University, and

Daniel Trefler, University of Toronto and NBER, "Does Improved Market Access Raise Plant-Level Productivity?"

Jiandong Ju, University of Oklahoma, and **Shang-jin Wei**, International Monetary Fund and NBER, "Domestic Institutions and the Bypass Effect of International Capital Flows"

Wolfgang Keller and **Carol H. Shiue**, University of Colorado, Boulder and NBER, "Tariffs, Trains, and Trade: The Role of Institutions versus Technology in the Expansion of Markets"

In order to study the impact of offshoring on sectoral and economy-wide rates of unemployment, **Mitra** and **Ranjan** construct a two-sector general equilibrium model in which labor is mobile across the sectors and unemployment is caused by search frictions. They find that, contrary to general perception, wages increase and sectoral unemployment declines because of offshoring. This result can be understood to arise from the productivity enhancing (cost reducing) effect of offshoring. If the search cost is identical in the two sectors, or even if the search cost is higher in the sector that experiences offshoring, the economy-wide rate of unemployment decreases. The researchers also find multiple equilibrium outcomes in the extent of offshoring and therefore, in the unemployment rate. Furthermore, a firm can increase its domestic employment through offshoring. Also, such a firm's domestic employment can be higher than that of a firm choosing to remain fully domestic. When they modify the model to disallow intersectoral labor mobility, the negative terms-of-trade effect on the sector in which firms offshore some of their production activity becomes stronger. In such a case, it is possible for this effect to

offset the positive productivity effect, and to result in a rise in unemployment in that sector. In the other sector, offshoring has a much stronger unemployment reducing effect in the absence of intersectoral labor mobility than in the presence of it. Finally, allowing for an endogenous number of varieties in the offshoring sector provides an additional indirect channel through which sectoral unemployment goes down.

Falling costs of coordination and communication have allowed firms in rich countries to fragment their production process and offshore an increasing share of the value chain to low-wage countries. Popular discussions about the aggregate impact of this phenomenon on rich countries have stressed either a (positive) productivity effect associated with increased gains from trade or a (negative) terms-of-trade effect linked with the vanishing effect of distance on wages. **Rodriguez-Clare** proposes a Ricardian model where both of these effects are present. He analyzes the effects of increased fragmentation and offshoring in the short run and in the long run (when technology levels are endogenous). The short-run analysis shows that when fragmentation is sufficiently high, further increases in fragmentation lead to

a deterioration (improvement) in the real wage in the rich (poor) country. But the long-run analysis reveals that these effects may be reversed as countries adjust their research efforts in response to increased offshoring. In particular, the rich country always gains from increased fragmentation in the long run, whereas poor countries see their static gains partially eroded by a decline in their research efforts.

Foreign-owned firms are often hypothesized to generate productivity "spillovers" to the host country, but both theoretical micro-foundations and empirical evidence for this are limited. **Malchow-Moller**, **Markusen**, and **Schjerning** develop a heterogeneous-firm model in which ex-ante identical workers learn from their employers in proportion to the firm's productivity. Foreign-owned firms have, on average, higher productivity in equilibrium because of entry costs, which means that low-productivity foreign firms cannot enter. Foreign firms have higher wage growth and, with some exceptions, pay higher average wages, but not when compared to similarly large domestic firms. The empirical implications of the model are tested on matched employer-employee data from Denmark. The authors find considerable evidence

of higher wages and wage growth in foreign-owned firms; these effects are significantly reduced but generally not eliminated when controlling for firm size. The results are largely consistent with their model. Furthermore, productivity transfers appear to be important, as experience from foreign-owned and large firms is clearly beneficial for subsequent wages and self-employment earnings.

Product-level data on bilateral U.S. exports exhibit two strong patterns. First, most potential export flows are not present and the incidence of these “export zeros” is strongly correlated with distance and importing country size. Second, export unit values are positively related to distance. **Baldwin** and **Harrigan** show that every well-known multi-good general equilibrium trade model is inconsistent with at least some of these facts. They also offer direct statistical evidence of the importance of trade costs in explaining zeros, using the long-term decline in the cost of air shipment to identify a difference-in-differences estimator. To match these facts, they propose a new version of the heterogeneous-firms trade model pioneered by Melitz (2003). In their model, high quality firms are the most competitive, with heterogeneous quality increasing with firms’ heterogeneous cost.

Lileeva and **Trefler** weigh into the debate about whether rising productivity is ever a consequence, rather than a cause, of exporting. They argue that improved market access should induce plants to invest in productivity-enhancing activities. Further, improved market access should not induce all plants to invest,

only those that expect the largest returns to such investments. That is, there should be heterogeneous responses to improved market access. Using data on plant-specific tariff concessions afforded Canadian plants under the Canada-U.S. Free Trade Agreement as an instrument for exporting, the researchers compare the performance of new (post-Agreement) exporters with non-exporters. They find that relative to non-exporters, new exporters experienced higher rates of labor productivity growth and higher rates of investment in product development and advanced manufacturing technologies.

Why does FDI travel from rich to poor countries but non-FDI not do so? Could financial and property rights institutions play different roles in understanding capital flows? Unbundling both institutions and capital flows, **Ju** and **Wei** propose a simple model for studying the relationship between various domestic institutions — financial system, corporate governance, and property rights protection — and patterns of international capital flows. They describe conditions under which inefficient financial systems and poor corporate governance in a country may be bypassed by two-way capital flows in which domestic savings would leave the country in the form of outflows of financial capital but domestic investment would take place via the inflows of foreign direct investment. In this framework, financial, and property rights institutions can have different effects on capital flows.

Keller and **Shiue** study the emergence of the increasingly unified commodity market in Europe in the nine-

teenth century. During this period, there were major institutional changes in the form of currency agreements and the *Zollverein* customs liberalizations, as well as transport cost reductions in the form of building railways. In assessing the relative importance of these factors, the setting here has a number of clear advantages over existing studies. For one, almost all economies in this sample experienced changes over the course of the nineteenth century. Currency or trade arrangements did not exist between any of the states in the early 1800s, whereas by the closing years of the nineteenth century they existed between all German states. Similarly, railroads did not exist before the 1830s, whereas by the end of the century trains had arrived almost everywhere in the sample. The authors study changes in market integration in terms of the spatial dispersion of grain prices in 68 markets with about 10,000 observations, located in five different countries and fifteen different German states. They find that the emergence of integrated commodity markets in nineteenth century Europe is, in a major part, attributable to the transportation revolution in the form of the railways. Over a relatively short time horizon, the effect of customs liberalization is comparable in size, whereas in the long run, the impact of railways is larger. The researchers do not estimate a significant effect of currency agreements on market integration. Their results suggest that as significant as institutional factors were for the expansion of markets, technology factors may have been even more important.

Education Program Meeting

The NBER's Education Program met in Cambridge on April 26. Program Director Caroline M. Hoxby of Harvard University organized the meeting. These papers were discussed:

Amalia R. Miller, University of Virginia, and **Lei Zhang**, Clemson University, "Did Welfare Reform Improve the Academic Performance of Children in Low-Income Households?"

Thomas Kane, Harvard University and NBER; **Douglas Staiger**, Dartmouth College and NBER; **Steven Cantrell**, Learning Point Associates; and **Jon**

Fullerton, Harvard University, "National Board Certification and Teacher Effectiveness: Evidence from a Random Assignment Experiment"

Damon Clark, University of Florida, "Elite Schools and Academic Performance"

Justine S. Hastings, Yale University and NBER, and **Richard Van Weelden** and **Jeffrey M. Weinstein**, Yale University, "Preferences, Information, and Parental Choice Behavior in Public School Choice"

Asim Khwaja, Harvard University; **Tahir Andrabi**, Pomona College; and **Jishnu Das**, The World Bank, "Students Today, Teachers Tomorrow? Identifying Constraints on the Provision of Education"

Karthik Muralidharan, Harvard University, and **Venkatesh Sundararaman**, The World Bank, "Teacher Incentives in Developing Countries: Experimental Evidence from India"

During the 1990s, U.S. welfare policy underwent dramatic reforms aimed at promoting employment and reducing dependence on public assistance. While the immediate effects of welfare reform on adult employment and family income have been studied extensively, little is known about its long-run effect on the well-being of children in low-income families. **Miller** and **Zhang** evaluate the impact of welfare reform on the academic performance of children in low-income families using nationally representative data on math achievement that spans a ten-year period starting just prior to welfare reform. In a generalized difference-in-differences framework, they use children from more affluent families as a control group to simulate the unobservable counterfactual time trend. The key finding is an improvement in the relative math scores of fourth-grade students from low-income families, which is statistically significant for 2003 and 2005. No consistent differences are found by race, sex, or ability. The treatment effect is smaller for eighth-grade students, but the benefits from early exposure appear to persist and even increase with age. Preliminary analysis suggests that these beneficial effects are asso-

ciated with relative improvements in low-income children's time use and interaction with parents.

The National Board for Professional Teaching Standards (NBPTS) uses videos and essays to assess teachers' effectiveness. In elementary schools in Los Angeles, they find, classrooms randomly assigned to more highly rated teachers outperform their comparison group by a wider margin than classrooms taught by poorly rated teachers. Analogous to Lalonde (1986), **Kane** and his co-authors compare experimental and non-experimental estimates of teacher impacts (both for the *same* sample of teachers in earlier years as well as for a non-experimental comparison group). The estimates yielded by the non-experimental techniques are similar. By validating against student performance, Kane and his co-authors also make a number of suggestions for improving the NBPTS scaling process.

Many of the "choice" schools to which some U.S. students now have access appear popular with parents. Yet recent studies have found that the causal effect of attending these schools on student achievement is at best small, at least on "basic" outcomes such as statewide test scores. One explana-

tion for strong parental demand and weak achievement effects is that these schools have larger effects on "high-achievement" outcomes such as (for high schools) the probability of taking Advanced Placement courses and college admission prospects. **Clark** considers the impact of U.K. elite public schools. Students are assigned to these schools on the basis of a test taken in primary school, and he exploits this rule via an instrumental variables approach, comparing students on the border of elite and non-elite schools on a wide range of high school outcomes, including basic test scores, the probability of enrolling in advanced courses, and college entry. He shows that elite schools have small effects on test scores but much larger effects on advanced course-taking and college entry patterns. Investigating the mechanisms through which these effects operate, he finds that some can be attributed to the impact of elite schools on advanced course quality; some are likely attributable to the greater opportunities offered by elite schools.

The incentives and outcomes generated by public school choice depend to a large degree on parents' choice behavior. There is growing empirical evidence that low-income parents

place lower weights on academics when choosing schools, but there is little evidence as to why. **Hastings** and her co-authors use a field experiment in the Charlotte-Mecklenburg Public School district (CMS) to examine the degree to which information costs affect parental choices and their revealed preferences for academic achievement. The authors provided simplified information sheets on school average test scores, or test scores coupled with estimated odds of admission, to students in randomly selected schools along with their CMS school choice forms. They find that receiving simplified information leads to a significant increase in the average test score of the school chosen. This increase is equivalent to a doubling in the implicit preference for academic performance in a random utility model of school choice. Receiving information on odds of admission further increases the effect of simplified test score information on preferences for test scores among low-income families, but dampens the effect among higher-income families. Using within-family changes in choice behavior, the authors provide evidence that the estimated impact of simplified information is more consistent with lowered information costs than with suggestion or saliency.

Efforts to achieve universal primary education remain an elusive goal in most developing countries. Resource

constraints limit the extent to which demand-based subsidies can be used. **Khwaja** and his co-authors focus on a supply-side factor: the availability of low cost teachers and the resulting ability of the market to offer affordable education. Using data from rural Pakistan and official public school construction guidelines as an instrument, they find that private schools are three times more likely to exist in villages with girls' secondary schools. In contrast, there is little or no relationship between the presence of a private school and pre-existing girls' primary, or boys' primary and secondary schools. Moreover, villages that received girls' secondary schools not only show a more than doubling in educated women but also 20 percent lower teacher wages. In an environment with low female education levels and mobility, girls' secondary schools substantially increase the local supply of skilled women. This lowers wages for women in the local labor market and allows the market to offer affordable education. These findings highlight the prominent role of women as teachers in facilitating educational access and resonates with similar historical evidence from developed economies. Higher education (also) matters because the students of today are the teachers of tomorrow.

Performance pay for teachers is frequently suggested as a way of improv-

ing educational outcomes in schools, but the empirical evidence to date on its effectiveness is limited and mixed. **Muralidharan** and **Sundararaman** present results from a randomized evaluation of a teacher incentive program implemented across a representative sample of government-run rural primary schools in the Indian state of Andhra Pradesh. The program provided bonus payments to teachers based on the average improvement of their students' test scores in independently administered learning assessments (with a mean bonus of 3 percent of annual pay). Students in incentive schools performed significantly better than those in control schools, by 0.19 and 0.12 standard deviations in math and language tests respectively. They scored significantly higher on "conceptual" as well as "mechanical" components of the tests suggesting that the gains in test scores represented an actual increase in learning outcomes. Incentive schools also performed better on subjects for which there were no incentives. The researchers find no significant difference in the effectiveness of group versus individual teacher incentives. Incentive schools performed significantly better than other randomly-chosen schools that received additional schooling inputs of a similar value.

Health Care Program Meeting

The NBER's Health Care Program held its spring meeting on April 26. Program Director David A. Cutler of Harvard University — along with Robert Huckman, NBER and Harvard Business School; Ernst R. Berndt, NBER and MIT; and Alan M. Garber, NBER and Stanford University — organized the meeting. These papers were discussed:

Katherine Ho, Columbia University and NBER; **John Asker**, New York University; and **Catherine Thomas**, Columbia University, “Does Hospitals-Insurer Price Negotiation Affect Investment and Outcomes?”

Jill R. Horwitz, University of Michigan and NBER, and **Austin Nichols**, Urban Institute, “Peer Pressure: Hospital Ownership Mix and Service Provision”

Industry Executive Panel:
Ralph W. Muller, CEO, University of Pennsylvania Health System
Peter L. Slavin, President, Massachusetts General Hospital

Ann P. Bartel, Columbia University and NBER; **Nancy Beaulieu**, Harvard Business School and NBER; **Ciaran S. Phibbs**, Stanford University School of Medicine; and **Patricia W.**

Stone, Columbia University School of Nursing, “Human Capital and Relational Capital in the Nursing Workforce: An Analysis of Their Impacts on Patient Outcomes”

Jonathan Skinner and **Douglas O. Staiger**, Dartmouth College and NBER, “Technology Diffusion and Productivity Growth in Health Care”

James B. Rebitzer, Case Western Reserve University and NBER, “Organizational Economics and the Hospital Industry”

Ho and her co-authors investigate how hospitals responded to changes in incentives introduced by the Health Care Reform Acts of the mid-1990s in New Jersey and New York. These legislative acts removed the centralized rate setting systems determining the prices paid to individual hospitals by private insurers (excluding HMOs in New York) and allowed these insurers to set rates through bilateral bargaining with hospitals. Preliminary results suggest that hospitals responded by forming bargaining coalitions (systems) and by reducing beds. There is no evidence, at the hospital level, to suggest that there was a systematic response in how patients were treated or in the adoption of new technology. Further research into the determinants of the modes of response continues.

Conflicting theories of the nonprofit firm have existed for several decades, yet empirical research has not resolved these debates, partly because the theories are not easily testable but also because empirical research generally considers organizations in isolation, rather than in markets. In their paper, **Horwitz** and **Nichols** examine three types of hospitals — nonprofit, for-profit, and government — and their spillover effects. They look at the effect of for-profit ownership share within

markets on both the likelihood of offering profitable and unprofitable medical services, and operating margins. They find that nonprofit hospitals are more likely to offer profitable services and less likely to offer unprofitable services in markets with a higher concentration of for-profit hospitals, but there is no statistically significant effect of for-profit market share on operating margins. These results fit best with theories in which nonprofit hospitals maximize their own output.

Bartel and her co-authors use a unique panel dataset (Veterans Administration acute-care hospitals for the time period 2003 through 2006) to study the impact of human capital and relational capital in the nursing workforce on nursing-sensitive patient outcomes. Unlike most of the prior work on nursing and patient outcomes that uses the hospital as the unit of analysis and focuses on the impact of nurse staffing, their study uses the nursing unit as the unit of analysis and goes beyond estimating the impact of nurse staffing to consider the attributes of the nursing workforce. Since hospital nursing units are quite heterogeneous, using aggregated data is likely to mask the true relationship between nurse characteristics and patient outcomes. The approach in this paper thus provides a more accu-

rate measure of this relationship. In this preliminary version, the authors study the impact of RN education and RN tenure in the current hospital on two measures of nursing-sensitive patient outcomes in intensive care units, the rate of infections and the failure to rescue rate. They find that RN education and RN tenure are negatively correlated with the rate of infections and the effect of RN tenure holds even when they control for nursing unit fixed effects. The latter finding suggests that policies that encourage RN retention should have beneficial effects on patient outcomes.

Skinner and **Staiger** examine productivity in the treatment of heart attacks across hospitals and over time. In their model, physicians search optimally over new technological innovations. The authors test the model using U.S. Medicare data on survival and factor inputs for 2.8 million heart attack patients during 1986–2004 combined with a 1994–5 survey on technology adoption. They find that the speed of adopting highly efficient and often low-cost innovations such as beta blockers, aspirin, and primary reperfusion explains a large fraction of variations in productivity, and swamps the impact of traditional factor inputs. The empirical patterns are also consistent with those

found in macroeconomic cross-country studies: the persistence of rapid or slow adoption within institutions, a lack of convergence in output, substantial differences in long-run productivity, and the importance of a productivity “frontier.” Large informational barriers to adoption are the best explanation for why some physicians fail to prescribe even aspirin

for their patients, and could also explain puzzling empirical patterns in other sectors of the economy.

In his presentation, **Rebitzer** posed three questions: Why are quality improvement initiatives (such as pay for performance and cross-functional work teams) so hard to implement? How might new investments in information technology

(both within and across organizations) influence care quality? How do coordination costs shape patterns of specialization, referral, and ownership? In discussing potential answers to these questions, Rebitzer applied ideas from organizational economics to highlight new avenues for economic research on hospitals.

Higher Education Working Group

The NBER's Working Group On Higher Education met in Cambridge on April 27. Group Director Charles T. Clotfelter of Duke University organized the meeting. These papers were discussed:

Philip Babcock, University of California, Santa Barbara, and **Mindy Marks**, University of California, Riverside, “The Falling Time Cost of College: Evidence from Half a Century of Time Use Data”
Discussant: Linda Loury, Tufts University

Eric T. Stuen, **Ahmed Mushfiq Mobarak**, and **Keith E. Maskus**, University of Colorado at Boulder,

“Foreign Ph.D. Students and Innovation at U.S. Universities: Evidence from Enrollment Fluctuations”
Discussant: Richard B. Freeman, Harvard University and NBER

Wayne A. Grove, Le Moyne College, and **Stephen Wu**, Hamilton College, “Lost in Translation? The Difficulty of Identifying Foreign Talent”
Discussant: Ofer Malamud, University of Chicago

Mark C. Long, University of Washington, “Nearby Affirmative Action and its Effect on College Quality”
Discussant: David Mustard, University of Georgia

Isaac McFarlin, Jr., University of Texas at Dallas, “Do Public Subsidies Promote College Access and Completion? Evidence from Community College Districts”
Discussant: Bridget T. Long, Harvard University and NBER

John McDowell, Arizona State University; **Larry D. Singell, Jr.**, University of Oregon; and **Mark Stater**, University of Georgia, “Congratulations or Condolences? The Role of Human Capital in the Cultivation of a University Administrator”
Discussant: David Zimmerman, Williams College and NBER

Using multiple datasets and five different time periods, **Babcock** and **Marks** document and quantify changes in time use by full-time college students in the United States between 1961 and 2004. They find large and continuous declines in academic time investment over this period. In 1961 full-time college students appeared to allocate about 40 hours per week toward class and studying, whereas full-time students in 2004 appear to have invested about 23 to 26 hours per week. The declines were extremely broad-based and are not easily explained by changes in work choices or in the composition of students or schools. The authors explore the implications of this finding, focusing in

particular on wage regressions and a recalculation of the college wage premium.

Stuen and his co-authors use panel data on 2300 science and engineering departments at 100 large American universities from 1973 to 1998 to estimate the impact of foreign and domestic graduate students in a department on the publications and patents produced by that department. Macroeconomic shocks and policy changes in source countries that differentially affect enrollments across fields and universities in the United States are used to instrument for the supply of students by region. The authors also aggregate micro data on every Ph.D. recipient at all major science and engineering

departments in the United States between 1960 and 2005 to create student enrollment counts by source country. Further, they create citation-weighted publication counts for each academic department by automating thousands of *Web of Science* publication and citation searches. They also identify academic patents and allocate them to fields of inquiry. They show that both foreign and domestic graduate students are central inputs into knowledge creation, and that certain estimates of the foreign student contribution are biased downwards. The impact of an additional foreign doctoral student varies by source region and by the type of shock that sends the student to the United States.

In an increasingly globalized world, some firms with high-skilled jobs search world-wide for the best talent. Whereas identifying talent and the correct firm-employee fit are difficult and expensive under any circumstance, hiring foreign workers complicates the task of evaluating individual's skill sets (both cognitive and non-cognitive abilities) and their match with company and industry standards and cultural norms. To analyze the differences that U.S. selection committees face in identifying foreign versus domestic talent, **Grove** and **Wu** use applicants to a single top-five economics Ph.D. program in 1989 (N=344), although those individuals obtained economics Ph.D.s from 50 different U.S. doctoral departments and 11 foreign programs. Admission committee members judge students' potential economics talent (for example, their preparation, aptitude, drive, and creativity) based on the uniform evidence provided in the application folders: standardized test scores, the course selection and grades provided in transcripts, the quality of the undergraduate institution, fellow economists' evaluations of their potential economics talent, and other relevant information. Because non-U.S. citizens received 68 percent of economics doctoral degrees as of 2003, the signals used by economics Ph.D. admission committees (such as the globally-ranked quality of undergraduate schools or of the letter-of-reference writers) provide considerably less help in identifying economics talent for those educated outside U.S. borders. Grove and Wu reach two broad sets of conclusions. First, foreign undergraduates attended higher quality Ph.D. programs and were more likely to complete the doctorate than U.S. baccalaureates, but experienced no differences in initial job placement or research productivity 17 years later. Second, many of the results previously reported in the literature regarding determinants of some aspect of graduate school and career success vary according to whether the indi-

viduals received their undergraduate training in the United States or elsewhere. Four notable differences emerge: 1) GRE scores (quantitative scores matter more for those with U.S. baccalaureates but verbal scores for those from abroad); 2) gender (for graduate school outcomes and publishing success); and for initial job placement and early career research productivity, both 3) the quality of the Ph.D. program attended and 4) the dissertation advisor. For example, Ph.D. program quality affects the initial job placement of U.S. undergraduates but the publication success of foreign baccalaureates. By contrast, U.S. (but not foreign) undergraduates' research productivity increased for those with a globally-ranked researcher as a dissertation advisor.

Long explores how variation in the availability of affirmative action practiced by nearby colleges affected the application and enrollment decisions of three cohorts of students in 1972, 1982, and 1992. He finds significant differences in the degree of preference given to minority applicants by various college characteristics, with less affirmative action used by private colleges and colleges in the Midwest (particularly in later cohorts), and more selective institutions giving larger preferences to minority applicants. Given the spatial distribution of college characteristics, Long finds substantial variation in the degree of affirmative action available to students at nearby colleges. However, this variation in nearby affirmative action had very small effects on the average quality of institutions at which minority and non-minority students apply and enroll. More nearby affirmative action increases the likelihood that minority students apply to a 4-year college, and increases the likelihood that the highest ability non-minority college applicants submit more than one application.

Governments spend heavily on across-the-board tuition subsidies to make college accessible for high school graduates.

Direct state appropriations to post-secondary schools currently exceed \$65 billion per year. Despite the expensive nature of this intervention, remarkably little is known about its causal impact on college-going behavior. Uncertainty surrounding the efficacy of public subsidies in higher education is largely attributable to the virtual absence of plausible exogenous variation in college price. Using a large sample of Texas students, **McFarlin** exploits geographic variation in college price associated with community college taxing-district residency to estimate the impact of tuition policy on college attainment. His paper is a progress report on efforts to assess how well public subsidies shape college decisions. The early findings suggest that while public subsidies for community colleges play an important role in promoting access and also improving the likelihood of completing an associate's degree, they concurrently appear to "crowd out" enrollments at public four-year colleges and to decrease the chances of receiving a baccalaureate degree. This research also sheds light on the seemingly overlooked pervasiveness of college districts throughout the American higher education landscape.

Administrative skill is essential to organizational effectiveness. Yet, few studies have examined how human capital investments over a career affect selection into administration. **McDowell**, **Singell**, and **Stater** use panel data for economists to estimate the probability of choosing administration over a pure academic track. Their results show that, while research-specific human capital reduces the probability of becoming an administrator, general human capital increases it. There are also inferior administrative opportunities for women that have not improved over time and variation in the role of human capital according to institutional research mission. Thus, their results suggest academic leaders are not merely born, but cultivated.

Political Economy

NBER's Program on Political Economy met in Cambridge on May 4. Program Director Alberto Alesina of Harvard University organized the meeting. These papers were discussed:

Matthew Gentzkow, University of Chicago, and **Jesse Shapiro**, University of Chicago and NBER, "What Drives Media Slant? Evidence from U.S. Daily Newspapers" (NBER Working Paper No. 12707)
Discussant: Ethan Kaplan, Stockholm University

Giuseppe Nicoletti and **Stefano Scarpetta**, OECD, and **Giuseppe Fiori** and **Fabio Schiantarelli**, Boston College, "Employment Outcomes and

the Interaction Between Product and Labor Market Deregulation: Are They Substitutes or Complements?"
Discussant: Francesco Giavazzi, Bocconi University and NBER

Adi Brender, Bank of Israel, and **Allan Drazen**, University of Maryland and NBER, "Why is Economic Policy Different in New Democracies? Affecting Attitudes About Democracy"
Discussant: Bard Harstad, Northwestern University

Oriana Bandiera and **Andrea Prat**, London School of Economics, and **Tommaso Valletti**, Imperial College London, "Active and Passive Waste in Government Spending: Evidence from a

Policy Experiment"
Discussant: Roberto Perotti, Bocconi University and NBER

Rodney Ramcharan, International Monetary Fund, "Inequality and Redistribution: Evidence from U.S. Counties and States, 1890–1930"
Discussant: Asim Ijaz Khwaja, Harvard University

Daron Acemoglu, MIT and NBER, and **James A. Robinson**, Harvard University and NBER, "Persistence of Power, Elites, and Institutions"
Discussant: Casey Mulligan, University of Chicago and NBER

Gentzkow and **Shapiro** construct a new index of media slant that measures whether a news outlet's language is more similar to a congressional Republican or Democrat. They apply the measure to study the market forces that determine political content in the news. They estimate a model of newspaper demand that incorporates slant explicitly, estimate the slant that would be chosen if newspapers independently maximized their own profits, and compare these ideal points with firms' actual choices. Their analysis confirms an economically significant demand for news slanted toward one's own political ideology. Firms respond strongly to consumer preferences, which account for roughly 20 percent of the variation in measured slant in their sample. By contrast, the identity of a newspaper's owner explains far less of the variation in slant, and they find little evidence that media conglomerates homogenize news to minimize fixed costs in the production of content.

Fiori and his co-authors provide a systematic empirical investigation of the effect of product market liberalization on employment when there are interactions between policies and institutions in

product and labor markets. Using panel data for OECD countries over the period 1980–2002, they show that product market deregulation is more effective at the margin when labor market regulation is high. Moreover, there is evidence in their sample that product market deregulation promotes labor market deregulation. They show that these results are mostly consistent with the basic predictions of a standard bargaining mode—such as Blanchard and Giavazzi (2003)—extended to allow for a richer specification of the fall back position of the union and for taxation.

When democracy is new, it is often fragile and not fully consolidated. **Brender** and **Drazen** investigate how the danger of a collapse of democracy may affect fiscal policy in comparison to countries where democracy is older and often more established. They argue that the attitude of the citizenry towards democracy is important in preventing democratic collapse and expenditures therefore may be used to convince them that "democracy works". This contrasts with much of the literature that concentrates on policy directed towards anti-democratic elites. The authors consider the inference prob-

lem that citizens solve in looking at economic outcomes and forming their beliefs about the efficacy of democracy. They argue that the implications of the model are broadly consistent with the empirical patterns generally observed, including the existence of political budget cycles at the aggregate level in new democracies that are not observed in old democracies.

Bandiera, **Prat**, and **Valletti** propose a distinction between active waste (a situation where the presence of waste benefits the public decisionmaker, as in the case of bribery) and passive waste (pure inefficiency, possibly because of excessive red tape). They analyze purchases of several standardized goods by over 200 Italian public bodies and exploit a policy experiment that introduced a national procurement agency. A revealed preference argument implies that the decision to buy from the new procurement agency rather than from traditional suppliers can be used to distinguish between active and passive waste. Their results indicate that: 1) different public bodies pay widely different prices for observationally equivalent goods, with centralized bodies paying on average at least 25 percent more than semi-autonomous bodies; 2) price

differences are mostly because of passive rather than active waste — on average passive waste accounts for 79 to 92 percent of estimated waste; and 3) there is no trade-off between passive and active waste.

Does economic inequality affect redistributive policy? **Ramcharan** turns to U.S. county and state data on land inequality over the period 1890–1930 to help address this fundamental question in political economy. To facilitate causal inference, he uses indicators of weather risk — rainfall, growing degree days, and topographical variability — as instruments for land inequality. The evidence strongly supports those theories that posit a causal connection between the distribution of wealth, political institutions, and redistributive policies. The instrumental variables estimates indicate that greater

inequality is associated with less political competition, and less redistribution.

Acemoglu and **Robinson** construct a model to study the implications of changes in political institutions for economic institutions and economic outcomes. The model society consists of elites and citizens who have different preferences over economic institutions. The main idea is that equilibrium economic institutions are a result of the exercise of de jure and de facto political power. A change in political institutions — for example a move from nondemocracy to democracy — alters the distribution of de jure political power, but the elite can intensify their investments in de facto political power, for example by lobbying or using paramilitary forces, to partially or even fully offset their loss of de

jure power. Thus equilibrium changes in political institutions may have little or no effect on the (stochastic) equilibrium distribution of economic institutions. The interplay between de jure and de facto political power also leads to a number of new comparative static results. The authors then show that when changing political institutions is more difficult than altering economic institutions, the model implies a pattern of captured democracy, whereby a democratic regime may survive, but chooses economic institutions favoring the elite. The model provides conditions under which economic or policy outcomes will be invariant to changes in political institutions and economic institutions themselves will persist over time.

Market Microstructure

The NBER's Working Group on Market Microstructure met on May 11 in Cambridge. Group Director Bruce Lehmann of University of California, San Diego; Eugene Kandel, Hebrew University, Jerusalem; and Avanidhar Subrahmanyam, University of California, Los Angeles, jointly organized the meeting. These papers were discussed:

Carole Comerton-Forde, University of Sydney; **Terrence Hendershott**, University of California, Berkeley; and **Charles M. Jones**, Columbia University, "Market Maker Revenues and Stock Market Liquidity"
Discussant: Ekkehart Boehmer, Texas A&M University

Dean P. Foster and **Krishna**

Ramaswamy, University of Pennsylvania, and **Simon Gervais**, Duke University, "The Benefits of Volume-Conditional Order-Crossing"
Discussant: Lawrence Glosten, Columbia University

James Dow, London Business School; **Itay Goldstein**, University of Pennsylvania; and **Alexander Guembel**, University of Oxford, "Incentives for Information Production in Markets where Prices Affect Real Investment"
Discussant: Gunter Strobl, University of North Carolina

David Easley and **Maureen O'Hara**, Cornell University, "Microstructure and Ambiguity"
Discussant: Judson Caskey, University

of California, Los Angeles

Hendrik Bessembinder and **Marios Panayides**, University of Utah, and **Kumar Venkataraman**, Southern Methodist University, "In Search of Liquidity: An Analysis of Order Submission Strategies in Automated Markets"
Discussant: Ohad Kadan, Washington University

Carol L. Osler, Brandeis University, and **Alexander Mende** and **Lukas Menkhoff**, University of Hannover, Germany, "Price Discovery in Currency Markets"
Discussant: Tarun Ramadorai, University of Oxford

Comerton-Forde and her co-authors use an 11-year panel of daily specialist revenues on individual NYSE stocks to explore the relationship between market-maker revenues and liquidity. If market makers suffer substantial trading losses,

lenders may respond by increasing funding costs or reducing credit lines, and market makers should respond by reducing liquidity provision. The data indicate that when specialists in aggregate lose money on their inventories, market-wide effec-

tive spreads widen in the days or weeks that follow, even after controlling for stock returns, volatility, and volume. This suggests an important role for market-maker financial performance in explaining liquidity time-variation. Revenues at

the specialist firm level explain liquidity changes in that firm's assigned stocks. Revenues at the individual stock level do not explain changes in individual stock liquidity, consistent with a financial constraints model with broadly diversified intermediaries. Aggregate specialist revenues are increasing in conditional return volatility, as is revenue volatility. Specialist margins (specialist revenue per dollar of trading volume) are essentially constant across stocks, implying limited scope for cross-subsidization.

Foster and his co-authors assess the role and viability of an order-crossing or market-clearing mechanism that is automatically triggered only when a minimum number of shares can be crossed. Such a mechanism is naturally more attractive to traders who do not require much immediacy for their trades, as liquidity is cheaper in this market than in a continuous-auction market. The volume condition that they propose is crucial to the effectiveness with which this market complements the continuous-auction market in two important ways. First, when appropriately set, the volume condition endogenously adjusts the probability that market-clearing is triggered and so keeps impatient traders and highly informed traders away. Second, because market-clearing with a large volume condition reduces the effects of adverse selection in this market, patient traders are more willing to place orders in it. As the researchers show, these effects often combine into a Pareto-dominating equilibrium when the continuous-auction market and the crossing mechanism with the right volume condition are both open.

A fundamental role of financial markets is to gather information on firms' investment opportunities, and thus to help guide investment decisions. **Dow**

and his co-authors study the incentives for information production when prices perform this allocational role. If firms cancel planned investments following poor stock market response, the value of their shares will become insensitive to information on investment opportunities, so that speculators will be deterred from producing information *ex ante*. Based on this insight, the researchers derive several new results on the determinants of information production and the resulting firm value and investment policy. They show that information production on investment opportunities is distinctly different than that on assets in place, and argue that some over-investment increases firm value.

A general goal for stock exchanges is to increase participation by firms and investors. Recent research has highlighted the role of ambiguity in affecting participation. **Easley** and **O'Hara** show the role that microstructure can play in reducing the ambiguity confronting traders. They develop a model with objective expected utility maximizing traders and naive traders, and they show how these naïve traders can choose to participate or not participate in markets. The researchers then show how specific features of the microstructure can reduce the perceived ambiguity, and induce participation by both firms and issuers. Their analysis demonstrates how designing markets to reduce ambiguity can benefit investors through greater liquidity, exchanges through greater volume, and issuing firms through a lower cost of capital.

Bessembinder and his co-authors study limit order traders' joint decisions regarding order price, order size, and order exposure in markets where the option to hide a portion of order size exists. Using order-level data from Euronext-Paris, the authors document that hidden

orders are used extensively by market participants, representing approximately 44 percent of order volume. After controlling for known determinants of order price aggressiveness, order exposure, and order size, and allowing for simultaneity in the decisions, they show that the traders electing to post aggressively priced orders tend to expose their orders, while the traders placing orders away from the best quotes tend to hide their orders. Further, traders choose to hide a larger portion of their orders when they have also selected larger orders. All else equal, hidden orders are associated with smaller opportunity costs and lower implementation shortfall costs. However, the offsetting costs are that hidden orders are associated with lower probability of full execution and longer times to execution. Overall, the evidence indicates that hidden orders are used primarily by uninformed traders to lower the option value of orders that are likely to be left standing in the book.

Osler and her co-authors make three contributions to our understanding of the price discovery process in currency markets with this paper. First, they show that this process cannot be the familiar one based on adverse selection and customer spreads, because such spreads are inversely related to a trade's likely information content. Second, they suggest three potential sources for the pattern of customer spreads, two of which rely on the information structure of the market. Third, they present an alternative price discovery process for currencies, centered on inventory management strategies in the interdealer market, and provide preliminary evidence for that process. They also suggest more broadly that the price discovery process will vary with market structure, and that their proposed mechanism may apply to liquid two-tier markets in general.

Cohort Studies

The NBER's Working Group on Cohort Studies, directed by Dora Costa of MIT, met on May 11 and 12. These papers were discussed:

Joseph Ferrie, Northwestern University and NBER; **Karen Rolf**, University of Nebraska; and **Werner Troesken**, University of Pittsburgh and NBER, "The Past as Prologue: The Effect of Early Life Circumstances at the Community and Household Levels on Mid-Life and Late-Life Outcomes"

Grant Miller, Stanford University and NBER, and **Piedad Urdinola**, Universidad Nacional de Colombia, "Is Mortality in Developing Countries Pro-cyclical? Health Production and the Value of Time in Columbia's Coffee-Growing Regions"

Martha J. Bailey, University of Michigan and NBER, "Momma's Got the Pill: How Comstock Statutes and *Griswold v. Connecticut* Shaped U.S. Childbearing in the 1960s"

Elizabeth O. Ananat, Duke University and NBER, and **Joanna N. Lahey**, Texas A&M University, "Vice and Comstockery: Abortion and Birth Control Access and the 19th Century Demographic Transition"

Hoyt Bleakley, University of Chicago and NBER, "Spillovers and Aggregate Effects of Health Capital: Evidence from Campaigns Against Parasitic Disease in the Americas"

Trevon D. Logan, Ohio State University and NBER, "Economies of Scale in the Household: Evidence and

Implications from the American Past"

Douglas Almond, Columbia University and NBER, and **Bhashkar Mazumder**, Federal Reserve Bank of Chicago, "Prenatal Nutrition and Adult Outcomes: The Effect of Maternal Fasting During Ramadan"

Sven E. Wilson, Brigham Young University, "Institutional and Discretionary Discrimination in Public Sector Programs: The Union Army Disability Pension"

Chulhee Lee, Seoul National University, "Technological Changes and Employment of Older Manufacturing Workers in Early-Twentieth-Century America"

The impact of circumstances early in life on later life outcomes in the United States can now be explored using data linking individuals from Social Security records back to the manuscript schedules of federal population censuses shortly after their birth. This allows **Ferrie** and his co-authors to assess the effect of individual, household, and community level influences on longevity. They find that these all had substantial effects on age at death, as did characteristics measured at enlistment into the U.S. Army in World War II.

The inability to smooth consumption in developing countries is thought to make health vulnerable to sudden economic downturns. However, studies suggesting this relationship often examine events that influence health independently of economic conditions. **Miller** and **Urdinola** investigate how world coffee price shocks influence infant and child mortality in Colombia's coffee-growing regions. As in wealthy country studies, here they

find evidence of *procyclical* mortality and *countercyclical* health investments that appear linked to changes in the opportunity cost of time. These results suggest that in rural Colombia, any adverse health consequences of reduced transitory income during bad economic times are dominated by increases in time-intensive health investments, and the relative price of health may be a more powerful determinant of mortality than income.

The 1960s ushered in a new era in U.S. demographic history characterized by sharp reductions in family size. Using cross-state variation in the restrictiveness of anti-obscenity statutes, **Bailey** quantifies the importance of oral contraception in reducing married women's fertility. Her analysis has two central conclusions: First, bans on the sale of contraception limited the use of the birth control pill before the 1965 *Griswold* decision. Second, bans on the sale of contraception slowed the decline in birth rates in the early 1960s. Whereas differences in birth

rates between states with and without bans on sales are indistinguishable from zero in the pre- and post-period, they increased by approximately 6 births per 1000 women from 1959 to 1965, a figure comparable to back-of-the-envelope calculations that make use of differences in failure rates between the pill and other available methods. These estimates suggest that at least 20 percent of the fertility decline from 1960 to 1965 can be attributed to the introduction of the birth control pill.

During the nineteenth century, the U.S. birthrate fell by half. While previous economic literature has emphasized demand-side explanations for this decline—that rising land prices and literacy caused a decrease in demand for children—historians and others have emphasized changes in the supply of technologies to control fertility, including abortion and birth control. **Ananat** and **Lahey** exploit the introduction during the nineteenth century of state laws governing American women's access to abortion to measure the

effect of changes in the supply of fertility technologies on the number of children born. They estimate an increase in the birthrate of 3 to 8 percent when abortion is restricted, which lies within the ranges of estimates found for the effect of fertility control supply restrictions on birthrates today. Restriction of birth control access led to an increase of 3 to 4 percent, numbers also consistent with modern evidence. By demonstrating the importance of legal abortion and birth control in reducing nineteenth-century birthrates, they account for a previously unexplained portion of the demographic transition. Moreover, they show that there has long been a demand, often unmet, for fertility control.

The effect of population health on aggregate income remains an open question, despite the substantial literature showing positive and long-lasting effects of health on productivity at the individual and cohort levels. **Bleakley** looks at several eradication campaigns against parasitic disease in the Americas. Previous work indicated that cohorts exposed to these campaigns as children had higher productivity and human capital. As these more productive cohorts entered the labor force, average incomes rose as well, above and beyond that attributable to the changing cohort composition of workers. This suggests, on net, the presence of positive spillovers from health capital. **Bleakley** also estimates the impact of average childhood exposure to the campaign on aggregate (state-level) income, where the effect is at least as large as the sum of estimated direct and spillover effects.

Household economies of scale arise when households with multiple members share public goods, making larger households better off at lower per capita expenditures. Research into household scale economies has yet to consider how household economies of scale change over time. **Logan** uses American household expenditure surveys, covering 1888 to 1935, to produce the first comparable historical

estimates of household scale economies in consumption. Scale economies in clothing, entertainment, and housing declined from 1888 to 1935, consistent with market expansion and increasing substitutes for these expenditures over time. Households in the past had fewer scale economies in food than today, however, exactly the opposite of what theory would predict and deepening a well known puzzle in the literature. Overall, **Logan** finds that scale economies changed significantly from 1888 to 1935 for all expenditure categories. He then considers the implications of changing scale economies for estimates of real income. Previous estimates of CPI bias based on Engel curves do not account for changing scale economies in the household, and this can lead to omitted variable bias. His estimates of the annual rate of CPI bias from 1888 to 1935 are reduced by at least 25 percent once changing scale economies are accounted for, consistent with household economies of scale having a large, material effect on estimates of real income.

Almond and **Mazumder** use maternal fasting during the Islamic holy month of Ramadan as a natural experiment for evaluating the long-term effects of prenatal nutrition. Because the timing of Ramadan varies by year, they can disentangle the effect of fasting from seasonal effects (for example weather, or virus exposure). They use the 2002 Uganda Census, which collects information on a range of adult outcomes (such as health, education, fertility) for a large sample of Muslims and non-Muslims. They find that the occurrence of Ramadan nine months before birth increases the likelihood among Muslims of having a physical disability in adulthood by close to 20 percent. Effects are found for blindness, deafness, disability involving the lower extremities, and mental disability. No corresponding effect is found among non-Muslims. Ramadan falling during the second month of pregnancy is positively associated with years of schooling and literacy for men. The

authors speculate that this may be attributable to selective attrition during a period of high fetal loss, which previous work has found to be more important among male fetuses. They find no evidence that negative selection in conceptions during Ramadan account for our results.

Wilson notes that, from the outset, the Union Army pension was nominally color-blind. But color-blind policy does not always prevent discrimination. In the early years of the pension, blacks were subject to “institutional discrimination” that resulted in dramatically lower application rates for blacks. Even after controlling for medical military history, blacks — who often faced a much harder burden in proving their identity and their military service, as well as being less able to navigate the intricacies and costs associated with pension application — fared much worse than whites. Soon after the war, they also began to experience “discretionary discrimination.” Popular support for increasing pension assistance resulted in increasing discretion exercised by the Pension Board. This discretion, however, was applied to a much greater extent to whites than blacks. Documented evidence from the War Department provided only a partial protection for black applicants, as whites with similar medical histories pulled away from blacks. In the decade prior to the 1890 liberalization of the pension system, both blacks and whites applied for pensions in increasing numbers, but the approval rate for black pensions plummeted as the rate for whites held stable. The 1890 law — which negated part of the discretionary role of the Pension Board — narrowed the enrollment gap considerably, but specific disabilities continued to be approved for whites at a higher rate than for blacks. This was most notably true for disabilities that were harder to diagnostically verify. By the turn of the century, the enrollment gap had become predominantly a result of discretionary discrimination rather than differential applica-

tion rates. Finally, although blacks and whites received similar pension awards when they entered the system, increases for white pensioners outpaced those given to blacks.

Lee explores how broadly-defined technological changes (including organizational and managerial transformations as well as innovations in production methods) in the U.S. manufacturing industries affected the probabilities of long-term unemployment and of retirement of older male workers in the early-twentieth-century United

States. For this purpose, industry-level statistics reported in the 1899 and 1909 manufacturing census were linked to the IPUMS of the 1910 census, and to a longitudinal sample of Union Army veterans. The results suggest that the rapid technological changes had both favorable and adverse impacts on the employment of older workers. On one hand, technological progress improved the employment prospect of older workers by enhancing labor productivity and by formalizing the workplace management. On the other hand, emer-

gence of large corporations and technological shifts toward more capital- and technology-intensive productions made it increasingly difficult for older workers to remain in the labor market, perhaps by increasing the requirements for physical strength, mental agility, and ability to acquire new skills. It is likely that the overall impact of technological changes on the employment of older workers during the industrial era was negative.

Japan Project Meets

The NBER together with the Center on the Japanese Economy and Business, The Center for Advanced Research in Finance, the Center on Japanese Economy and Business, the European Institute of Japanese Studies, and the Australia-Japan Research Centre held a project meeting on the Japanese economy in Tokyo on June 26 and 27. The co-chairs of the meeting were: Magnus Blomstrom, NBER and Stockholm School of Economics; Jennifer Corbett, Australia-Japan Research Centre; Fumio Hayashi, NBER and the University of Tokyo; Charles Horioka, NBER and Osaka University; Anil K Kashyap, NBER and the Graduate School of Business, University of Chicago; and David Weinstein, NBER and Columbia University. The following papers were discussed:

Dale W. Jorgenson, Harvard University, and **Koji Nomura**, Keio University, “The Industry Origins of the U.S.-Japan Productivity Gap”
Discussant: James Harrigan, Federal Reserve Bank of New York and NBER

Linda Allen and **Suparna**

Chakraborty, City University of New York, “Revisiting the Level Playing Field: Domestic and International Implications of the Divergences in Japanese Bank Capital Requirements from the Basel Accord”
Discussant: Joe Peek, University of Kentucky

Michiel van Leuvensteijn, CPB Netherlands Bureau for Economic Policy Analysis; **Jacob A. Bikker**, De Nederlandsche Bank; **Adrian A. R. J. M. van Rixtel**, Banco de Espana; and **Christoffer Kok-Sorensen**, European Central Bank, “A New Approach to Measuring Competition in the Loan Markets of the Euro Area”
Discussant: Guy Debelle, Reserve Bank of Australia

Akira Otani, **Shigenori Shiratsuka**, and **Takeshi Yamada**, Bank of Japan, “Distortions in Resource Allocation and Bank Lending: The Malfunction of Financial Intermediation”
Discussant: Nobuhiro Kiyotaki, Princeton University and NBER

Rasmus Fatum, University of Alberta,

and **Michael M. Hutchison**, University of California, Santa Cruz, “Evaluating Foreign Exchange Market Intervention: Self-Selection, Counterfactuals, and Average Treatment Effects”
Discussant: Kathryn M. E. Dominguez, University of Michigan and NBER

Kazuki Onji, Australian National University, “The Response of Firms to Eligibility Thresholds: Evidence from the Japanese Value-Added Tax”
Discussant: Mihir A. Desai, Harvard University and NBER

Yusaku Horiuchi, Australian National University, and **Jun Saito**, Wesleyan University, “Distributive Consequences of Unequal Participation”
Discussant: Matthew Gentzkow, University of Chicago and NBER

Tsutomu Watanabe, Hitotsubashi University, and **Tomoyoshi Yabu**, Bank of Japan, “The Great Intervention and Massive Money Injection: The Japanese Experience 2003–4”
Discussant: John V. Leahy, New York University and NBER

Jorgenson and **Nomura** compare total factor productivity (TFP) lev-

els in the United States and Japan for the period 1960–2004 and allocate

the observed gap to individual industries. They carefully distinguish the

various concepts of purchasing power parity (PPP) and measure them within the framework of a U.S.-Japan bilateral input-output table. They also measure industry-level PPPs for capital, labor, energy, and materials inputs and output for 42 industries common to both countries, based on detailed estimates for 164 commodities, 33 assets, including land and inventories, and 1596 labor categories. The U.S.-Japan productivity gap shrank during three decades of rapid Japanese economic growth, 1960–90. The Japanese manufacturing sector achieved parity with its U.S. counterpart by the end of the period. With the collapse of the Japanese economic bubble at the end of the 1980s, the U.S.-Japan productivity gap reversed course and expanded to 79.5 percent by 2004. This can be attributed to rapid productivity growth in the IT-producing industries in the United States during the late 1990s and the sharp acceleration of productivity growth in the IT-using industries in the United States during 2000–4. Wholesale and Retail Trade emerged as the largest contributor to this gap, accounting for 25.1 percent of the lower TFP of the Japanese economy.

The 1998 passage of the Land Revaluation Law in Japan provided regulatory forbearance to Japanese banks in the form of a regulatory capital infusion. **Allen** and **Chakraborty** test whether this divergence from international bank capital requirements had an effect on Japanese bank lending behavior. Because this natural experiment created an exogenous supply shock, the researchers can use it to disentangle demand and supply effects so as to determine the impact on Japanese bank lending in the United States and Japan. They find that the infusion of regulatory capital had no aggregate impact on Japanese bank lending in Japan, but it did change the allocation of loans. Well-capitalized Japanese banks shifted their lending from low margin, less capital intensive mortgage lending toward higher yielding, more capital intensive commercial loans. Moreover, they find

evidence consistent with a shifting of Japanese bank lending activity away from U.S. lending (which is predominantly real estate based) to domestic lending to fund manufacturing. Thus, they discover that divergences from international capital standards have significant allocative effects on lending, as well as on bank profitability.

van Leuvensteijn and co-authors are the first to apply a new measure of competition, the Boone indicator, to the banking industry. This approach measures the competition of bank market segments, such as the loan market, versus many well-known measures of competition that only can consider the entire banking market. One caveat of the Boone-indicator may be that it assumes that banks generally pass on at least part of their efficiency gains to their clients. Like most other model-based measures, this approach ignores differences in bank product quality and design, as well as the attractiveness of innovations. The researchers measure competition on the lending markets in the five major EU countries and, for comparison, the United Kingdom, the United States, and Japan. Bearing the aforementioned caveats in mind, the findings indicate that from 1994–2004 the United States had the most competitive loan market, whereas overall loan markets in Germany and Spain were among the most competitive in the EU. The Netherlands occupied a more intermediate position, whereas in Italy competition declined significantly over time. The French, Japanese, and UK loan markets were generally less competitive. Turning to competition among specific types of banks, the commercial banks tend to be more competitive, particularly in Germany and the United States, than savings and cooperative banks.

Otani and his co-authors empirically analyze the interaction between the distortions in the real side of the economy (real distortion) and those in the financial side of the economy (financial distortion) in Japan after the 1990s. They focus on protracted eco-

nomical stagnation after the bursting of the asset price bubble, and the subsequent recovery in economic activity and restoration of financial system stability. They use the intersectoral differences in relative factor prices as an indicator for the real distortion, and use the gap between the actual and benchmark loan portfolios, based on the mean-variance approach to maximizing risk adjusted returns from loan portfolios, as an indicator for financial distortion. They show that both distortions sharply deteriorated in the late 1990s and improved in the 2000s. In addition, they conduct panel data analyses using data at the individual bank level as well as at the industry level to examine the interaction between the two distortions: the interaction was negative in the late 1990s, but reversed to positive in the 2000s.

Estimating the effect of official foreign exchange market intervention is complicated by the fact that intervention at any point entails a “self-selection” choice made by the authorities and that no counterfactual is observed. To address these issues, **Fatum** and **Hutchison** estimate the “counterfactual” exchange rate movement in the absence of intervention by introducing the method of propensity score matching to estimate the “average treatment effect” (ATE) of intervention. To derive the propensity scores, they introduce a new intervention reaction function that includes the difference between market expectations and official announcements of macroeconomic developments that can influence the decision to intervene. They estimate the ATE for daily official intervention in Japan over the January 1999 to March 2004 period. This sample encompasses a remarkable variation in intervention frequencies as well as unprecedented frequent intervention towards the latter part of the period. They find that the effects of intervention vary dramatically and inversely with the frequency of intervention: intervention is effective over the 1999 to 2002 period and ineffective (or pos-

sibly counterproductive) during 2003 and 2004. These results hold up to a variety of robustness tests. Only sporadic and relative infrequent intervention appears to be effective.

It is common to define benefit eligibility for small business policies by restrictions on the firm size. **Onji** investigates the incentives for a large firm to “masquerade” as many small firms by separately incorporating business segments, focusing on the case of the Japanese value-added tax. He finds that the masquerading behavior was pervasive and took place quickly after the introduction of tax incentives. Tax avoidance accounted for 3.4 percent of the overall revenue drain attributable to the preferential tax treatment of small businesses, but the efficiency consequence would not have been severe. This study suggests that the strategy may be commonplace in other settings.

Does popular participation in political processes affect economic policy outcomes? To answer this longstanding but recently re-visited question, **Horiuchi** and **Saito** estimate the causal effects of political participation on distributive policy outcomes, using a large municipality-level dataset from Japan. The theoretical rationale is that risk-averse incumbents listen to “voices” (policy needs) of participants more than to those of non-participants.

To test various hypotheses derived from this theory, the existing studies typically had used voter turnout, but these researchers argue that this overlooks an important dimension of political participation. In addition to voting in elections, some citizens communicate with incumbents more effectively, through more direct modes of political participation. Methodologically, a valid measure should be voter-turnout *weighted* by how much those who turn out to vote can pitch their voice to policymakers so that their policy needs can be heard more effectively than those of the “silent majority.” With effective instrumental variables, the authors show that their estimates are far larger than the conventional estimates under the assumption of homogeneity among voters.

From the beginning of 2003 to the spring of 2004, Japan’s monetary authorities conducted large-scale yen-selling/dollar-buying foreign exchange operations in what Taylor (2006) has labeled the “Great Intervention.” **Watanabe** and **Yabu** empirically examine the relationship between this “Great Intervention” and the quantitative easing policy the Bank of Japan (BOJ) was pursuing at that time. Using daily data on the amount of foreign exchange interventions and current account balances at the BOJ, they conclude first

that, while about 60 percent of the yen funds supplied to the market by yen-selling interventions were immediately offset by the BOJ’s monetary operations, the remaining 40 percent were not offset and remained in the market for some time. This is in contrast to the preceding period, when almost 100 percent were offset. Second, comparing foreign exchange interventions and other government payments, the extent to which the funds were offset by the BOJ was much smaller in the case of foreign exchange interventions, and the funds also remained in the market longer. This suggests that the BOJ differentiated between and responded differently to foreign exchange interventions and other government payments. Third, the majority of financing bills issued to cover intervention funds were purchased by the BOJ from the market immediately after they were issued. For that reason, no substantial decrease in current account balances linked with the issuance of FBs could be observed. These three findings indicate that it is highly likely that the BOJ, in order to implement its policy target of maintaining current account balances at a high level, intentionally did not sterilize yen-selling/dollar-buying interventions.

Economic Fluctuations and Growth Research Meeting

The summer research meeting of the NBER's Economic Fluctuations and Growth Program, which was organized by Lawrence Christiano, NBER and Northwestern University, and Patrick Kehoe, NBER and Federal Reserve Bank of Minneapolis, took place in Cambridge on July 14. The following papers were discussed:

Richard Rogerson, Arizona State University and NBER, and **Johanna Wallenius**, Arizona State University, "Micro and Macro Elasticities in a Life Cycle Model with Taxes"
Critic: Robert E. Hall, Stanford University and NBER

Enrique G. Mendoza, University

of Maryland and NBER; **Vincenzo Quadrini**, University of Southern California and NBER; and **Jose-Victor Rios-Rull**, University of Pennsylvania and NBER, "Financial Integration, Financial Deepness and Global Imbalances"
Critic: Charles M. Engel, University of Wisconsin and NBER

William Dupor, **Jing Han**, and **Yi Chan Tsai**, Ohio State University, "What do Technology Shocks Tell Us about the New Keynesian Paradigm?"
Critic: Robert King, Boston University and NBER

Daron Acemoglu and **Simon Johnson**, MIT and NBER, "Disease

and Development: The Effect of Life Expectancy on Economic Growth"
Critic: Gary Becker, University of Chicago

Nir Jaimovich, Stanford University, and **Henry Siu**, University of British Columbia, "The Young, the Old, and the Restless: Demographics and Business Cycle Volatility"
Critic: Valerie A. Ramey, University of California, San Diego and NBER

Guido Menzio, University of Pennsylvania, "A Search Theory of Rigid Prices"
Critic: Robert Shimer, University of Chicago and NBER

Rogerson and **Wallenius** build a life-cycle model of labor supply that incorporates changes along both the intensive and extensive margin and use it to assess the consequences of changes in tax and transfer policies on equilibrium hours of work. They find that changes in taxes have large aggregate effects on hours of work. Moreover, they find that there is no inconsistency between this result and the empirical finding of small labor elasticities for prime age workers. In their model, micro and macro elasticities are effectively unrelated. Their model is also consistent with other cross-country patterns.

Large and persistent global financial imbalances need not be the harbinger of a world financial crash. Instead, **Mendoza** and his co-authors show that these imbalances can be the outcome of financial integration when countries differ in financial markets deepness. In particular, countries with more advanced financial markets accumulate foreign liabilities in a gradual, long-lasting process. Differences in financial deepness also affect the composition of foreign portfolios: countries with negative net foreign asset positions main-

tain positive net holdings of non-diversifiable equity and FDI. Abstracting from the potential impact of globalization on financial development, liberalization leads to sizable welfare gains for the more financially-developed countries and losses for the others. Three empirical observations motivate this analysis: 1) financial deepness varies widely even among industrial countries, with the United States ranking at the top; 2) the secular decline in the U.S. net foreign asset position started in the early 1980s, together with a gradual process of international capital markets liberalization; 3) net exports and current account balances are negatively correlated with indicators of financial development.

Researchers have used unanticipated changes in monetary policy to identify preference and technology parameters of macroeconomic models. **Dupor** and his co-authors use changes in technology to identify the same set of parameters. Estimates based on technology shocks differ substantially from those based on monetary policy shocks. In the post World War II United States, a positive technology shock reduces inflation and increases hours worked, sig-

nificantly and rapidly in both cases. Relative to policy shock identification, technology shock identification implies: 1) long duration durability in preferences instead of short duration habit, and 2) built-in inflation inertia disappears and price flexibility increases. In response to technological improvement, consumption durability increases hours worked because households temporarily increase labor supply to accumulate durables towards new, higher steady-state levels. Limited nominal rigidities allow inflation to fall because firms are able to immediately cut prices when households' labor supply increases.

What is the effect of increasing life expectancy on economic growth? To answer this question, **Acemoglu** and **Johnson** exploit the international epidemiological transition, the wave of international health innovations and improvements that began in the 1940s. They obtain estimates of mortality by disease before the 1940s from the League of Nations and national public health sources. Using these data, they construct an instrument for changes in life expectancy, referred to as predicted mortality, which is based on the pre-intervention distribution of mortality from various

diseases around the world and dates of global interventions. They document that predicted mortality has a large and robust effect on changes in life expectancy starting in 1940, but no effect on changes in life expectancy before the interventions. The instrumented changes in life expectancy have a large effect on population; a 1 percent increase in life expectancy leads to an increase in population of about 1.5 percent. Life expectancy has a much smaller effect on total GDP both initially and over a 40-year horizon, though. Consequently, there is no evidence that the large exogenous increase in life expectancy led to a significant increase in per capita economic growth. These results confirm that global efforts to combat poor health conditions in less developed countries can be highly effective, but also shed doubt on the argument that unfavorable health conditions are the root cause of the poverty of some nations.

Jaimovich and Siu investigate the consequences of demographic change for business cycle analysis. They find that changes in the age composition of the labor force account for a significant fraction of the variation in business cycle volatility observed in the United States and other G7 economies. During the postwar period, these countries experienced dramatic demographic change, although details regarding extent and timing differ from place to place. Using panel-data methods, they exploit this variation to show that the age composition of the workforce has a large and statistically significant effect on cyclical volatility. They conclude by relating these findings to the recent decline in U.S. business cycle volatility. Using both simple accounting exercises and a quantitative general equilibrium model, they find that demographic change accounts for a significant part of this moderation.

Menzio builds a model marketplace populated by a finite number of sellers — each producing its own variety of the good — and a continuum of buyers — each searching for a variety he likes. Using the model, he studies the response of a seller's price to privately observed fluctuations in its idiosyncratic production cost. He finds that the qualitative properties of this response critically depend on the persistence of the production cost. In particular, if the cost is i.i.d., the seller's price does not respond at all. If the cost is somewhat persistent, the seller's price responds slowly and incompletely. If the cost is very persistent, the seller's price adjusts instantaneously and efficiently to all fluctuations in productivity. Menzio argues that these findings can explain why the monthly frequency of a price change is so much lower for processed than for raw goods.



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