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Program Report

Labor Studies

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The Labor Studies (LS) Program is one of the largest and most active in the NBER, with almost 150 members producing nearly 200 Working Papers each year. The breadth of topics and expertise is stunning: it ranges from cutting edge research on aggregate labor market issues like unemployment and productivity to the effects of government programs like Disability Insurance, the differences in labor market outcomes among different educational, gender, and racial groups, and to many other topics in social science.

Reflecting their diversity, two-thirds of program members are affiliated with at least one other NBER program, and in the past few years the Labor Studies program has convened joint sessions at the NBER's Summer Institute with Public Economics, Economics of Education, Economics of Children, and with Working Groups in Personnel Economics and the Economics of Crime. This summer we will add a new joint session with Development Economics.

In this report I briefly summarize some of the main themes emerging from recent work by LS affiliates in three areas: immigration, gender, and unemployment. These topics barely scratch the surface of the vast body of work by LS affiliates, but give a flavor of some of the emerging ideas and latest techniques in the field.

Immigration

Over the past three decades, Labor Studies researchers have produced a series of major NBER research volumes on the economics of immigration (Abowd and Freeman, 1991; Borjas and Freeman, 1992; Borjas, 2000; and Borjas 2007) as well as many influential articles.

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This work continues with a focus on several new issues related to immigration.

One such issue relates to the growing importance of immigrants in the science and engineering workforce of the United States, particularly at the doctoral level, where immigrants now make up about one-half of all newly awarded Ph.D.s. John Bound, Sarah Turner, and Patrick Walsh (14792) point out that this has been driven in part by the rapid rise in the production of bachelors' degrees *outside* the United States, and they document its impact on the demand for advanced training inside the United States. Jeffrey Grogger and Gordon Hanson (18780) use data from the Survey of Earned Doctorates to study the determinants of which foreign-born students intend to stay in the United States. They find that the United States attracts the most talented foreign students, and they also show how changing economic conditions in sending countries affect the decision to stay. Using a unique survey of authors of recent scientific publications, Paula Stephan, Chiara Franzoni, and Giuseppe Scellato (18809) find that high prestige of the program or job and strong career prospects are the major factors driving the decisions of Ph.D. students and post-doctoral candidates to choose the United States over other potential host countries.

The impact of these foreign born scientists, engineers, and other highly trained workers is the subject of several recent studies. William Kerr and William Lincoln (15768) use data from the H-1B visa program to study the city-level and firm-level impacts of foreign-born science and engineering workers. While a traditional concern is that the foreign-born tend to crowd out natives, their analysis suggests that the opposite may be true, in part because of the direct employment contribution of foreign born inventors. George Borjas and Kirk Doran, who study the inflow of Russian mathematicians to U.S. universities following the collapse of the Soviet Union (17800), reach the opposite conclusion. Their analysis of publications and career mobility suggests that, in the case of advanced-level mathematics, the "pie" is essentially fixed, with no positive spillovers for native scholars.

Another emerging strand of research by LS members focuses on the broader impacts of immigration flows on local and national

economies. Frederic Docquier, Caglar Ozden, and Giovanni Peri (16646) use new data on labor force stocks and migration flows by education level for OECD countries, combined with detailed models of the labor markets in each country, to simulate impacts of population movements on a country-by-country basis. They conclude that immigration has been a net positive factor for workers in most countries. Francine Blau and Lawrence Kahn (18515) similarly review the effects of immigration on the overall distribution of incomes in the United States and other major countries. They conclude that the presence of immigrants has contributed to wage inequality, although the effect is small relative to other forces, such as technology and trade. Peri (17570) similarly concludes that immigration has had little effect on poverty rates in the United States.

Language skills have long been recognized as a major factor in understanding differences between natives and immigrants, and several recent NBER Working Papers explore the impacts of language ability among immigrants. Jennifer Hunt (18696) finds that the lack of English language skills accounts for most of the pay gap between natives and immigrants with an undergraduate degree in engineering. Ethan Lewis (17609) shows that differences in language skills lead to a segmentation of the occupations held by immigrants and natives. The segmentation is most apparent in cities with large fractions of Spanish speakers. In the extreme case of Puerto Rico, Lewis finds that immigrants and natives are in much more direct labor market competition.

Gender

Members of the LS program have played a preeminent role in research on gender-related issues for many decades. Though the wide disparities in the labor market status of men and women that characterized earlier generations have narrowed, many differences remain, and in some cases new gaps have opened up. Much recent attention has focused on the dramatic *reversal* of the gender gap in educational attainment. As documented by Claudia Goldin, Lawrence Katz, and Ilyana Kuziemko (12139), female high school graduates had narrowed the differences with their male peers in achievement test scores, and were more likely to attend and graduate from college, by the early 1990s. Blau, Peter Brummund, and Albert Yung-Hsu Liu (17993) show that this sharp rise in relative education of women correlates with a decline in occupational segregation between male and female workers, as more educated women have entered traditionally male occupations.

While women are more likely to attend and complete college than men, there are still large differences in fields of study. Joseph Altonji, Erica Blom, and Costas Meghir (17985) use data on field of degree in the American Community Survey to document that women are under-represented in engineering, computer science, physics, economics, and business, but over-represented in communications, psychology, education, and English. The latter fields are associated with lower earnings for both men and women. These researchers show that differences in college major choices are an important contributor to the earnings disparities between college-educated men and women.

One factor that may explain some of the gender gap in education choices, career progression, and pay is a difference in "competitiveness." Muriel Niederle and Lise Vesterlund (11474) conducted a series of laboratory experiments to gauge willingness to compete in tournament-like competitions, and found sharp differences between men and women that remain even after controlling for risk aversion and over-optimism. Thomas Buser, Niederle, and Hessel Oosternbeek (18576) correlate similar measures for students in the Netherlands, and show that differences in competitiveness help to explain the lower fraction of girls who choose the most prestigious (science-based) track at high school.

More recent cohorts of women also have narrowed the gap in cumulative labor market experience relative to men. Martha Bailey, Brad Hershbein, and Amalia Miller (17922) show that some of this increase in career attachment was due to easier access to birth control and lower early fertility. Raquel Fernandez and Joyce Cheng Wong (17508) highlight the effect of the rising risk of divorce on women's decisions to acquire more education and stay attached to the labor market.

The rise in the relative success of women also may have been helped along by a decline in the demand for the manual skills traditionally supplied by less-educated men. Paul Beaudry and Lewis (18159) show that in cities where the college-high school wage gap has risen more quickly, the male-female wage gap has narrowed more quickly. They then show that both trends were correlated with more rapid local adoption of computer technology in the 1980s and 1990s, underscoring the role of changing relative skill demand. Similarly, Chinhui Juhn, Gergely Ujhelyi, and Carolina Villegas-Sanchez (18106) show that passage of NAFTA led Mexican firms to adopt new technologies that reduced the demand for physical skills and ultimately led to increased hiring of women relative to men.

Despite the progress made by recent cohorts, women still fall behind men, particularly in certain fields like science and engineering, and in high-profile careers in management and business. Marianne Bertrand, Goldin, and Katz (14681) study MBA graduates from a top U.S. school, and show that the male-female earnings gap widens steadily after initial completion of the degree, reaching 80 percentage points over 16 years. They find that the presence of children is a powerful predictor of career interruptions and lower hours for females, but not for men, and that these factors are highly related to earnings. Ty Wilde, Lily Batchelder, and David Ellwood (16582) reach a similar conclusion for a broader sample of women in the 1979 National

Longitudinal Survey of Youth: childbearing has a strong negative effect on wage growth, particularly for higher-skilled women.

Unemployment, Job Displacement, and the Great Recession

The Great Recession has brought renewed interest in the study of labor market fluctuations, unemployment, and job displacement. While research is still ongoing, prominent contributions by LS members already have shed light on the labor market impacts of the Great Recession and its likely consequences.

Michael Elsby, Bart Hobijn, and Ayesegul Sahin (15979) provide an early analysis of the labor market consequences of the downturn that began in 2007. They note that the impact of the recession was particularly severe for men, who were disproportionately affected by job losses in construction and manufacturing. They also highlight the remarkable growth in long-term unemployment which is one of the hallmarks of the Great Recession. Henry Farber (17040) used data from the Displaced Worker Survey of January 2010 to show that nearly one in six U.S. workers reported having lost a job during 2007–9. Comparing recent job losers to those in earlier surveys, he noted a sharp decline in re-employment rates and a rise in measured earnings losses.

Hilary Hoynes, Douglas Miller, and Jessamyn Schaller (17951) provide a systematic analysis of the relative impact of the Great Recession across various demographic groups. Their research, based on monthly data from the Current Population Survey, shows that the relative responses to the most recent downturn were quite consistent with patterns in earlier recessions but larger in magnitude, reflecting the severity of the downturn. One of the least affected groups was older workers — a fact confirmed by Alan Gustmann, Thomas Steinmeier, and Nahid Tabatabai (17547) based on data from the Health and Retirement Survey.

Steven Davis and Till von Wachter (17638) evaluate the longer-run costs of the massive job losses during the Great Recession. Using data from Social Security earnings records for job losers in the 1970s, 1980s, and 1990s, they estimate that a "typical" displaced worker (a male with three or more years of job tenure, laid off from a firm experiencing a 30 percent or larger cut in employment) experienced about a 12 percent loss in the discounted present value of earnings over the next 20 or so years. The loss rises to 20 percent, however, when the overall unemployment rate is greater than 8 percent at displacement. These estimates suggest that the longer-run costs of the Great Recession will be very large, and that many job losers will never see their salaries rebound to their pre-job-loss levels.

One potential mechanism accounting for the high cost of long-term unemployment is that workers become less likely to find a new job, either because of real or perceived deterioration in their skills. Kory Kroft, Fabian Lange, and Mathew Notowidigdo (18387) conduct an ingenious field experiment to measure this effect. They submit fictitious job resumes to a large sample of job postings in different U.S. cities, randomly varying the length of time the (fictitious) applicant has been out of work. They find that applicants who have been out of work longer are less likely to be called for an interview, although the effects are moderated in cities with higher unemployment rates.

An important policy response to the Great Recession was a large increase in the potential duration of unemployment benefits — from the standard 26 weeks to as long as 99 weeks for job losers in some states. Jesse Rothstein (17534) uses month-to-month labor force transition data from the Current Population Survey to evaluate the impact of these longer benefits on re-employment rates and overall unemployment. Using a variety of approaches to control for unobserved variation in local labor market conditions, he concludes that the package of benefit extensions raised the unemployment rate in December 2010 by at most 0.5 percentage points — a smaller effect than would have been expected given existing estimates of the effect of longer benefits on the duration of unemployment claims in the literature.

Research Summaries

Understanding Financial Crises: Theory and Evidence from the Crisis of 2007–8

Viral Acharya*

For those who study economic history, financial crises are recurring phenomena, not as rare as they are often perceived to be, but showing up in new guises each time. There are often common economic forces at work across different crises, and my current research uses the financial and economic crises that erupted in August of 2007 as a laboratory for theoretical and empirical analysis of those forces. In the past, I focused on *market failures,* which can arise due to externalities ("neighborhood" or "spillover" effects) from the distress of financial firms, and *regulatory failures,* which can arise due to time-inconsistency problems, cognitive capture, or capture that is rooted in political economy problems. This article summarizes my research on these two failures and their interactions. In the conclusion, I mention my ongoing work on *government failures,* which can arise due to myopia of decision-making in fiscal and debt policy, and in policy designed to bail out a distressed financial sector.

Market Failure I: Short-term Debt, Default, and Externalities

Financial firms that lend to households and corporations (both banks and "shadow banks" that perform similar economic functions) have always featured short-term debt in their funding structures. The underlying economic rationale for this can be understood by considering the problem of the financier who funds a bank but, because of information problems, lacks precise knowledge and contractibility over loans made by the bank. The financier responds to this problem by saving the option *not to roll over* — in other words, by providing only short-term debt to the bank.

Financial crises occur when the economy is hit by shocks that lead the financier to exercise the option not to roll over the short-term debt because the bank is under-capitalized — that is, because bank-owners have little equity capital left as "skin-in-the-game" to continue lending prudently. If shocks are idiosyncratic to a bank, then the under-capitalized banks can be acquired, or their activities re-intermediated, by better-capitalized banks. If shocks instead are aggregate in nature, and the entire banking sector is heavily short-term financed, then banks suffer a coincident loss of capital, and efficient re-intermediation cannot take place. There may be disorderly liquidations or allocation inefficiency. This induces financiers to not roll over the short-term debt, and a "crisis" materializes.[1] Indeed, absent a sufficient pool of long-term capital in the economy, even relatively small aggregate shocks and inefficiencies perceived by financiers can lead to complete short-term debt "freezes."[2] Interestingly, losses to financiers are less likely in good economic times when the likelihood attached to aggregate shocks is small, leading to greater short-term leverage for the financial sector as a whole – including the entry of under-capitalized institutions. Therefore, somewhat counter-intuitively, crises can be more severe if an adverse aggregate shock materializes in good times than in bad times.

This *market failure* arises because of the coincidence of short-term debt in the capital structures of banks and related financial firms and aggregate shocks to their asset portfolios. Regulation might attempt to address this market failure with a "tax" — for example, a requirement that a bank hold a minimum level of equity capital that is dependent not just on its own asset portfolio risk and short-term debt but also on "systemic risk" — that depends on the aggregate component of asset risk and the level of system-wide short-term debt.[3] Policies of this type would link regulations to *macro-prudential* concerns that are related to financial crises and externalities, rather than (or not just) *micro-prudential* concerns related to the health of individual financial institutions.

In modern financial systems, much leverage is "embedded" in derivative contracts rather than associated with traditional short-term debt. A related but subtler externality arises in the context of derivatives. When an insurer sells protection against a risk to a number of counterparties, each party's position potentially affects the payoff on the other parties' positions, in a state of the world where the insurer lacks capital to honor its contractual promises. To reflect this *counterparty risk externality* suitably in the price of insurance, market participants need to know more than the bilateral positions; they need to know "what else is being done." When risks being hedged are aggregate in nature, private derivative contract terms in general will not internalize the counterparty risk externality, unless terms can be contracted upon the aggregate positions of the insurer. This suggests a potential role for creating transparency in derivatives markets, or requiring centralized

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clearing of relatively large over-the-counter (OTC) derivatives markets, as part of *macro-prudential* regulation.[4]

Regulatory Failures: Micro-prudential Capital and Liquidity Rules

Financial crises engulfed the Western economies beginning in 2007, and most prominently affected the United States during 2007–8. In the period leading up to the crisis, banks and related financial firms had extensive short-term debt and common exposure to residential mortgage assets. When an aggregate shock materialized by end of 2006, in the form of a secular housing price decline in the United States, short-term debt rollovers became increasingly difficult. There weren't adequate pools of capital to move mortgage assets off the balance-sheets of the financial sector and, eventually, short-term debt markets froze for many financial firms, leading to *en masse* failures in the fall of 2008.

At a high level, these facts fit the theoretical narrative of financial crises presented above. It is interesting to note, though, that there was elaborate regulatory apparatus in place both before and during the crisis, in particular in the form of Basel capital requirements. It is thus useful to understand why the financial sector's health eroded so rapidly following the housing price shock. Three examples of *regulatory failures* stand out from my work addressing the exposure of the financial sector as a whole to short-term debt and aggregate risk.

First, the financial crisis erupted in the form of rollover problems for short-term asset-backed commercial paper (ABCP) issued by special purpose vehicles (called "conduits" and structured investment vehicles, or SIVs). Many of these vehicles were sponsored by commercial banks and effectively guaranteed by them. These guarantees implied that the perceived risk transfer from special purpose vehicles was, in effect, non-existent. Adequate treatment for sponsoring such conduits *with guarantees* was, however, absent in regulatory capital requirements.[5] The importance of this regulatory policy can be seen by examining the international data: they show that countries such as the United States, the United Kingdom, and Germany, which adopted lax capital treatment of ABCP vehicles, had significant presence of their commercial banking sectors in the ABCP market, whereas their counterparts in Spain and Portugal, which adopted more prudent capital treatment of ABCP vehicles, had virtually no presence in this market.[6] In effect, while the commercial banking sector looked well-capitalized on the regulatory capital front during 2003–7, it had in fact built up significant short-term debt in shadow banks without an economic transfer of risks. This short-term debt experienced rollover problems beginning on August 8, 2007, precipitating the crisis (see Figure 1).

Second, as the rollover problems of short-term debt persisted, given the lack

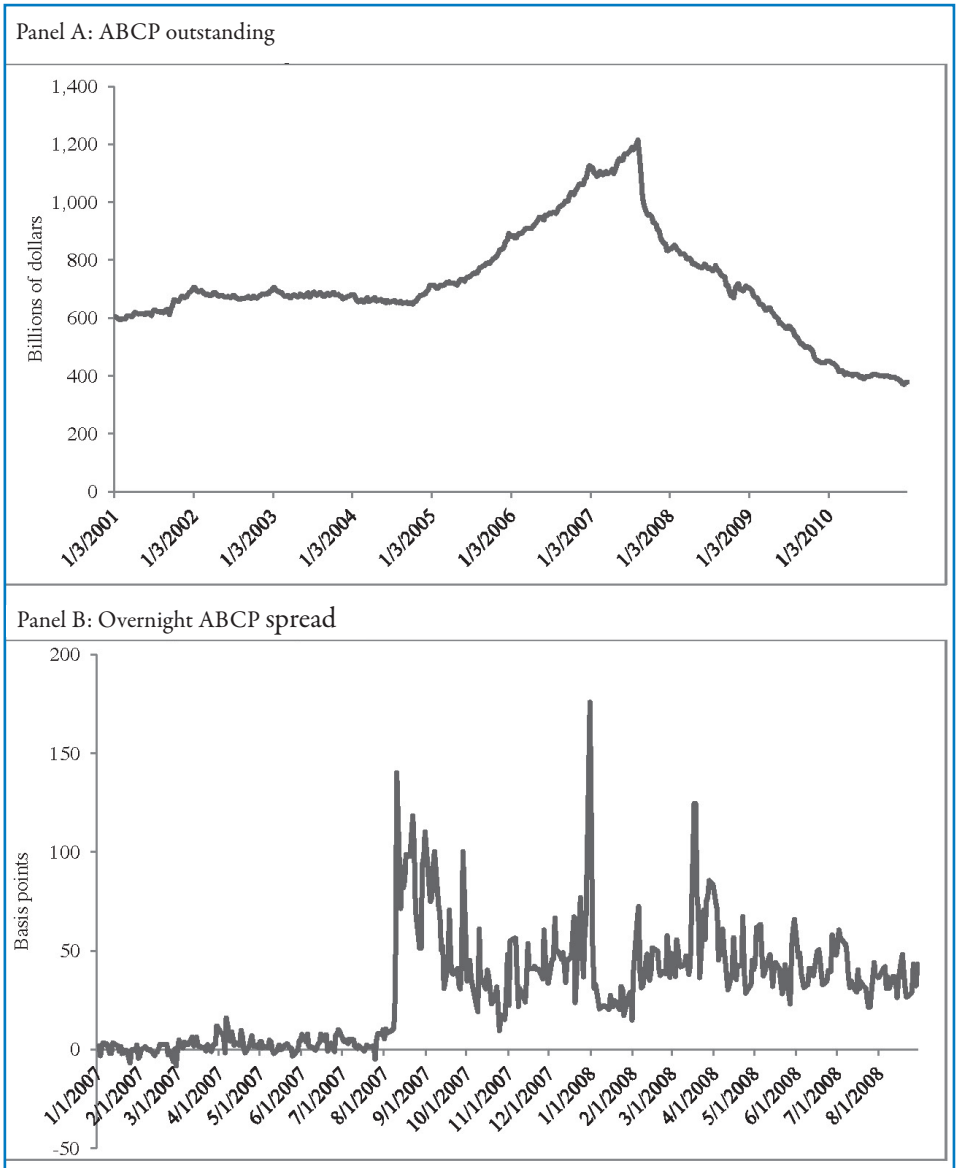

Figure 1 — Asset-backed commercial paper (ABCP) outstanding and spreads
Panel A plots total ABCP outstanding in the U.S. market from January 2001 to April 2010. Panel B shows the spread of overnight ABCP over the federal funds rate from January 2007 to August 2008. The figures are based on weekly data published by the Federal Reserve Board. Source: Acharya, Schnabl and Suarez (2013), see endnote 5.

of housing market recovery during 2007–8, banks and shadow banks sustained severe losses. The market value of their equity collapsed. A *macro-prudential* or system-wide approach to capital requirement of the financial sector necessitated a prompt response at the early stage of the crisis in order to get banks to reduce their reliance on short-term debt by issuing equity capital to redeem the debt that was coming due. And, further erosion of equity capital through payouts to employees and shareholders would have made the financial sector even more fragile. Nevertheless, not only did the distressed financial firms not reduce reliance on short-term debt, but they in fact paid out significant dividends — in some cases, increasing the payouts — in spite of mounting losses.[7] Throughout this period, banks were deemed to be well-capitalized by (micro-prudential) regulatory capital standards. This contributed to the lack of any significant regulatory action for addressing the worsening rollover risk of banks. In the end, this led to failure or near-failure of most of the largest financial firms in the United States and Western Europe, captured saliently by Lehman Brothers filing for bankruptcy on September 15, 2008.

Third, markets as well as regulators were caught off-guard by the case of AIG Financial Products, which had over $500 billion in notional outstanding insurance ("credit protection") sold to counterparties which were themselves large banks and financial firms. AIG FP was essentially deemed to be safe based on its *current* rating, but in effect it had significant leverage *conditional* on a future downgrade, and especially so if such downgrade coincided with system-wide stress: such stress would lead to recognition of losses in market prices of its assets and a demand for immediate collateral by its counterparties. The public disclosures provided by AIG FP show that the rollover risk it faced was never stated with adequate granularity with respect to significant downgrades, nor did it take account of the underlying aggregate risk exposure of the insurance it had sold to counterparties. Such disclosure or transparency was also not required by AIG FP's regulators, allowing the buildup of its significant derivatives book in an unchecked manner.[8]

Why did these "regulatory failures" arise? While potential explanations abound, a leading candidate is that regulation was focused on ensuring the safety and soundness of individual financial institutions. The rules and tools were in many cases inappropriate for assessing the buildup of aggregate risk of assets and of rollover risk from short-term debt of the financial sector.

Market Failures II: Transmission from Distressed Financial Firms to the Economy

The market failures arising from failures of large banks, or of banking systems at large, have received substantial attention in the literature. The focus is typically on the contraction of lending from banks to small and medium-sized enterprises — information-sensitive borrowers — and thus bank lending to those not easily re-intermediated by other lenders. My recent empirical work, exploiting as a "laboratory" the period immediately following August 2007 when banks faced rollover risk in the ABCP market, shows that effects of such failures are more far-reaching and multi-faceted than has been traditionally documented.

First, unlike the market stress episodes of the prior decade (notably the 1998 episode surrounding the near-collapse of Long Term Capital Management), the banking sector in the 2007–8 crisis did not experience an immediate net inflow of deposits. From early 2007 until the government bailout package was put in place, depositors appeared concerned about the banking sector's health and moved to prime money-market funds which invested only in government securities. Indeed, several banks with significant exposure to ABCP vehicles and undrawn lines of credit experienced significant rollover risk in the form of withdrawals of uninsured deposits. These banks responded by offering higher deposit rates in order to maintain their deposit base; up until a month before their failure, they succeeded in doing so by luring insured deposits even as their uninsured deposit base shrunk. Focusing *jointly* on deposit flows and rates helps us understand that rather than banks being *passive* liquidity backstops or preferred "safe havens" for investors in a crisis, banks are in fact *active* seekers of funding liquidity. Importantly, the fact that banks in trouble sought funding at aggressive rates imposed a deposit-rate externality on the funding costs other banks.[9]

Second, the effect of aggregate risk on bank intermediation activity is not limited to spot or term lending as is the focus of current literature. Banks provide liquidity insurance in the form of lines of credit to corporations, enabling corporations to free up cash holdings for profitable investments. As aggregate risk rises, the ability of the banking sector to smooth fees across firms and to honor the lines of credit declines, limiting the extent of liquidity insurance provided to corporations (fewer initiations of lines of credit, as well as higher fees, smaller amounts, and shorter maturities on initiations.) This, in turn, induces greater cash holdings and lower investment, even by relatively large corporations of the economy.[10]

Third, these effects were not limited to banks in the United States. Foreign banks provide a significant proportion of intermediation in the form of lines of credit in the United States. While the U.S. banks struggled for deposit funding too, as explained above, their funding was eased in part by the provision of public funding (starting in the fall of 2007) by the Federal Reserve and Federal Home Loan Banks. In contrast, many foreign banks without a depository base in the United States lacked access to public funding and faced "dollar shortages" — that is, rollover risk in dollars. As a result, the terms on lines of credit provided by foreign (European) banks to U.S. corporations relative to foreign borrowers worsened until December 2007 (when dollar swap lines were put in place by the Federal Reserve for foreign central banks), relative to such a differential effect in terms of lines of credit provided by U.S. banks.[11]

Fourth, inter-bank markets were significantly impaired because of the precautionary demand for liquidity of banks exposed to rollover risks. Using data from the United Kingdom, where large settlement banks indicate to the Bank of England each month their desired liquidity in the form of requested reserves, it can be seen that (exposed) banks raised their liquidity demands (more) following the ABCP freeze in August 2007 and the failure of Bear Stearns in March 2008. This liquidity demand was coincident with a rise in spreads charged in the inter-bank market, over and above the Bank of England policy rate, in both secured and unsecured markets. Furthermore, using data on bilateral inter-bank transactions, this rise in spreads can be attributed to the funding problems faced by lending banks rather than to the condition of borrowing banks. This suggests that the inter-bank market stress during 2007–8 was at least in part attributable to precautionary hoarding of liquidity by a significant part of the banking sector that faced rollover risk, and not just to an increase in the counterparty risk of borrowers.[12]

Finally, besides the precautionary demand for liquidity by banks facing rollover risk, relatively healthier banks can have strategic demand for liquidity for acquiring troubled banks, especially as the crisis gets deeper and bank failures become imminent. This can lead to further reduction in liquidity that is available in the aggregate for funding the financial system, households, and corporations. Evidence suggests that such a motive for holding cash took hold, especially around the failure of Lehman Brothers in September 2008.[13]

Conclusion

To summarize, existing theories and evidence on banking crises based on *market failures* (namely, the reliance of financial firms on short-term debt and the externalities from *en masse* failures of financial firms to roll over short-term debt) and *regulatory failures* (imperfect, incomplete, and sometimes misguided regulation) help us to understand both the regular incidence of crises in modern financial systems and their adverse consequences. Financial crises in the Western economies that started in 2007 bear testimony to the usefulness of this existing paradigm. Indeed, the paradigm appears to be a good starting point for thinking about the role of *macro-prudential* regulation, which considers the financial system at large, as well as *micro-prudential* regulation that is narrowly focused on the health of individual financial firms.

My current research explores a third failure, *government failure*, which arises because of myopic decision making in fiscal policy as well as policy aimed at bailing out a distressed financial sector. These government failures have the dramatic implication that financial sector and sovereign credit risks are intimately tied. Bank failures can trigger sovereign credit risk if bailouts lead the sovereign to sacrifice its creditworthiness; conversely, deterioration of sovereign credit risk can impose "collateral damage" on the financial sector directly through its holdings of government bonds and indirectly through the implicit government guarantees of the financial sector.[14] Perversely, this bank-sovereign two-way feedback may in fact be preferred by myopic governments that are reluctant to cut back on populist spending: entanglement of the financial sector with the sovereign is perceived by investors as a sign that the sovereign will find it too costly to default, boosting the sovereign's ex-ante ability to raise debt and spend, but resulting in a worse sovereign and financial crisis ex post.[15] Integrating governments and public policy into the existing models of banking crises remains an important topic for further work, as suggested by the ongoing banking and sovereign crises in the Eurozone.

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[1] *For a formal model capturing both the private desirability of short-term debt and how it can lead to aggregate crises (especially in times of good fundamentals), see V. V. Acharya and S. Viswanathan, "Leverage, Moral Hazard and Liquidity," NBER Working Paper No. 15837, March 2010, published in the* Journal of Finance, *66, (2011), pp.99–138.*

[2] *Such rollover risk and short-term debt freeze is modeled in V. V. Acharya, D. Gale, and T. Yorulmazer, "Rollover Risk and Market Freezes," NBER Working Paper No. 15674, January 2010, published in the* Journal of Finance, *66, (2011), pp.1175–1207.*

[3] *An implementable tax calculation based on systemic risk assessment of the financial sector can be found in V. V. Acharya, L. H. Pedersen, T. Philippon, and M. Richardson, "How to Calculate Systemic Risk Surcharges," published in* Quantifying Systemic Risk, *J. G. Haubrich and A.W. Lo, eds. Chicago, IL: University of Chicago Press, 2012.*

[4] *Counterparty risk externality arising in opaque over-the-counter derivatives markets is formalized in V. V. Acharya and A. Bisin, "Counterparty Risk Externality: Centralized versus Over-the-counter Markets," NBER Working Paper No. 17000, April 2011.*

[5] *Description of the ABCP conduits, their guarantees from commercial banks, and their eventual "runs," can be found in V. V. Acharya, P. Schnabl, and G. Suarez, "Securitization without Risk Transfer," NBER Working Paper No. 15730, February 2010, published in the* Journal of Financial Economics, *107, (2013), pp. 515–36.*

[6] *V. V. Acharya and P. Schnabl, "Do Global Banks Spread Global Imbalances? The Case of Asset-Backed Commercial Paper During the Financial Crisis of 2007–09," NBER Working Paper No. 16079, June 2010, published in* IMF Economic Review, *58, (2010), pp.37–73.*

[7] *V. V. Acharya, I. Gujral, N. Kulkarni, and H. S. Shin, "Dividends and Bank Capital in the Financial Crisis of 2007–09," NBER Working Paper No. 16896, March 2011.*

[8] *See a discussion of current disclosure practices of large financial institutions with regard to derivatives-linked collateral or margin liabilities, in V. V. Acharya, "A Transparency Standard for Derivatives," NBER Working Paper No. 17558, November 2011, published in* Risk Topography: Systemic Risk and Macro Modeling, *M.K. Brunnermeier and A.*

Krishnamurthy, eds., forthcoming from the University of Chicago Press.

[9] *These results are contained in V. V. Acharya and N. Mora, "Are Banks Passive Liquidity Backstops? Deposit Rates and Flows during the 2007–09 Crisis," NBER Working Paper No. 17838, February 2012.*

[10] *V. V. Acharya, H. Almeida, and M. Campello, "Aggregate Risk and the Choice between Cash and Lines of Credit," NBER Working Paper No. 16122, June 2010, forthcoming in the* Journal of Finance.

[11] *V. V. Acharya, G. Afonso, and A. Kovner, "How do Global Banks Scramble for Liquidity? Evidence from the Asset-Backed Commercial Paper Freeze of 2007," forthcoming as an NBER Working Paper.*

[12] *V. V. Acharya and O. Merrouche, "Precautionary Hoarding of Liquidity and Inter-Bank Markets: Evidence from the Sub-prime Crisis," NBER Working Paper No. 16395, September 2010, published in* Review of Finance,*17(1), (2013), pp.107–60.*

[13] *See theory and empirical evidence for strategic demand for cash in a crisis in V. V. Acharya, H. S. Shin, and T. Yorulmazer, "Crisis Resolution and Bank Liquidity," NBER Working Paper No. 15567, December 2009, published in* Review of Financial Studies, *24(6), (2011), pp. 2166–2205.*

[14] *For theoretical and empirical treatment of this bank-sovereign nexus, see V. V. Acharya , I. Drechsler, and P. Schnabl, "A Pyrrhic Victory? Bank Bailouts and Sovereign Credit Risk," NBER Working Paper No. 17136, June 2011.*

[15] *V. V. Acharya and R. G. Rajan, "Sovereign Debt, Government Myopia and the Financial Sector," NBER Working Paper No. 17542, October 2011, forthcoming in* Review of Financial Studies.

Immigrant Selection and Assimilation during the Age of Mass Migration

Leah Boustan*

The Age of Mass Migration from Europe to the New World (1850–1913) was one of the largest such episodes in human history. By 1910, 22 percent of the U.S. labor force was foreign born, compared to "only" 17 percent today. In a joint research program with Ran Abramitzky and Katherine Eriksson, I ask three related questions about this large and formative migrant flow: Were migrants who settled in the United States in the late nineteenth century positively or negatively selected from the European population? What was the economic return to this migration? And, how did these new migrants fare in the U.S. labor market, both upon first arrival and after spending some time in the country?

A better understanding of the Age of Mass migration can inform our views of the past and the present. During this era, the United States maintained an open border for European migrants, which allows us to observe the immigration process in the absence of government constraints. Furthermore, beliefs about (the lack of) immigrant assimilation at the time have contributed to the formation and passage of the more restrictive migration policies of today.

Our project greatly expands our knowledge of this era by creating and analyzing two large panel datasets of trans-Atlantic migrants from historical Census records. Our first dataset links 50,000 men from their birthplace in the 1865 Norwegian Census to their adult residence in 1900 in either the United States or Norway. We focus on Norway because it is a large sending country and has two complete digitized historical Censuses (1865 and 1900).[1] Our second dataset follows 24,000 men, including immigrants from 16 European sending countries and a comparison group of U.S. natives, in the U.S. labor market from 1900 to 1910 to 1920. Assembling this data has been made possible by the public release of Census manuscripts 70 or more years after the initial survey. We match individuals across Census waves by first name, last name, age, and place of birth.

For all of its advantages, the historical data also have two limitations. First, match rates across Censuses tend to be low, mainly because men with common names cannot be uniquely linked; our match rates range from 20 to 30 percent, which is standard in this literature.[2] Despite low match rates, our matched sample is roughly representative of the population. Second, we are only able to collect information about individual occupations, rather than individual earnings, which the Census first recorded only in 1940. Our standard approach is then to assign individuals the mean earnings in their occupation cell, which we refer to as "occupation-based earnings." This measure cannot capture aspects of the return to migration and of labor market assimila-

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tion that occurs by attaining higher earnings *within* occupation cells.

Economic Return to Migration

A simple measure of the return to migration contrasts the earnings of migrants to the United States with the earnings of men who stayed in Europe. This basic approach can be confounded by migrant selection. For example, if the brightest people — those who would have earned more regardless of location — were the most likely to move to the United States, then a naïve estimate of the return to migration will be biased upward; likewise, the return to migration will be biased downward in the case of negative selection. We thus compare the earnings of migrants to the earnings of their brother(s) who remained in Europe, an approach that eliminates the across-household component of migrant selection. Such selection will be present if households that were financially constrained or that faced poor economic opportunities in Europe experienced different propensities to migrate.

We estimate a return to migration within brother pairs of around 70 percent.[3] These returns are lower than contemporary estimates for the return to migration from Mexico to the United States, as would be expected given the relatively unconstrained supply of migrant labor in this era.[4] In addition, our estimation method reveals evidence of negative occupational selection for migrants leaving urban areas. In particular, we find that the population estimate of the return to migration in the urban sample is 20 to 30 percent lower than the within-brother estimate, a pattern that we attribute to negative selection of migrant households.

Migrant Selection

We provide more direct evidence of negative selection in this migrant flow by comparing the socio-economic status of the fathers of migrants and non-migrants.[5] We find that the fathers of migrants in both rural and urban areas have lower occupation-based earnings; are less likely to own assets, including land, an owner-occupied home, or a business; and, conditional on owning some land, have property of lesser value as proxied by their property tax bills. A similar pattern holds for both migration to the United States and internal migration within Norway. Taken together, this evidence suggests that men with poorer economic prospects were more likely to migrate in the late nineteenth century.

We further demonstrate that men with a higher likelihood of inheriting land are less likely to migrate. Inheritance varied both by birth order and by the gender composition of one's siblings. On Norway's western coast and in the far North, two areas where primogeniture was particularly strong, oldest sons could expect to inherit the family farm. In these regions, oldest brothers in households with land were less likely to migrate than were their younger brothers. In the rest of the country, household assets were more likely to be divided between sons. In these regions, men with more brothers, as opposed to sisters, from households with land were more likely to migrate. In both cases, the lower a man's expected wealth, the more likely he was to leave his municipality of birth for destinations both internal and international. Neither birth order nor gender composition of siblings influence migration among sons in landless households.

Migrant Assimilation

We then turn to the success of these newcomers in the U.S. labor market, asking how immigrants from Norway and 15 other sending countries fared upon arrival.[6] The consensus from prior studies, all of which have been based on cross-sectional data, is that these immigrants held substantially lower-paid occupations than natives upon first arrival but experienced rapid convergence with natives over time.[7] Yet inferring assimilation from a cross section is subject to well-known biases caused by changes in the skill levels of immigrant arrival cohorts over time and to the potentially selective return migration to source countries.[8] Over a quarter of migrants returned to Europe during this period. In some cases, return migrants used a deliberate strategy of temporary migration to the New World. These temporary migrants will appear negatively selected in our data if they remained in low-paid occupations during their short sojourn in the United States.

Ideally, one could follow the career trajectories of individual immigrants as they spend time in the United States. Our panel dataset approximates these ideal conditions. Contrary to the existing literature, we find that the typical immigrant in the panel did not face a large initial earnings penalty upon first arrival in the United States and moved up the occupational ladder at the same rate as the native born. We conclude that the large earnings gap and subsequent convergence observed in a single cross-section is driven by a combination of declining skill levels across immigrant arrival cohorts, both between and within countries-of-origin, and by the departure of negatively-selected return migrants.

Our study is the first to document the substantial heterogeneity in the assimilation patterns of migrants from different countries of origin. Immigrants from France, Russia, and the English-speaking countries of the United Kingdom held significantly higher-paid occupations than U.S. natives upon first arrival, while immigrants from other countries started out in equivalent or lower-paid occupations. Regardless of starting position, immigrants from almost every country moved up the occupational ladder at the same rate as natives, rather than progressing faster to converge with natives. As a result, any initial occupation-based gaps between immigrants and natives were preserved over time.

Broader Conclusions

Our work on the Age of Mass Migration contains three important lessons for our understanding of the economics of immigration.

Roy model

The Roy model predicts that migrants will be negatively selected if the send-

ing country has a higher return to skill or more unequal income distribution than the destination.[9] Unlike today, Norway was more unequal than the United States in the nineteenth century. Therefore, our finding of negative migrant selection from Norway to the United States is consistent with the standard Roy model.

In contrast, most work on contemporary immigrant flows finds little empirical support for the Roy model.[10] One explanation for positive migrant selection today is that the high cost of migration, including fees for entering the United States illegally, prevents the poor from engaging in migration.[11] The cost of migration was lower in the past, which may have allowed the negative selection predicted by the Roy model to be manifest.

Financial constraints

Hanson (2010) and Clemens (2011) forcefully argue that one of the most effective international development policies would be easing national migration restrictions in developed countries.[12] Yet, even if explicit barriers to migration were lowered, high migration costs and credit constraints might prevent the world's poor from moving to rich countries. Our finding of negative selection during the Age of Mass Migration suggests that a lack of household (or individual) wealth did not pose a barrier to migration at a time when U.S. borders were open to European migrants and migration costs were relatively low. These findings suggest that lifting migration restrictions may be sufficient to facilitate migration among the world's poor.

Assimilation

Contemporaries questioned the ability of European immigrants to assimilate into the U.S. economy and called for strict migration restrictions that favored countries with highly-skilled residents. Our results indicate that these concerns were unfounded: the average permanent immigrant in this era arrived with skills similar to those of natives and experienced identical rates of occupational upgrading over their lifecycle. These successful outcomes suggest that migration restrictions are not necessary to ensure migrant assimilation. At the same time, we also note that migrants who arrived with low skill levels did not manage to close their skill gap with natives over time. This finding undercuts the commonly-held view that, unlike today's migrants, past waves of European immigrants, even those who arrived without the ability to read or to speak English, were able to quickly catch up with natives.

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contrary view of the selection of Mexican migrants, see J. Fernández-Huertas Moraga, "New Evidence on Emigrant Selection," Review of Economics and Statistics, *93(2011), pp. 72–96.*

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Saving in Developing Countries

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The evolution of national savings in developing countries (a broad term that I use here to refer to middle-income emerging markets, as well as less developed low-income economies) has received considerable attention in discussions of global current account imbalances. In the run-up to the global financial crisis, these imbalances were characterized by large and rising current account deficits in the United States, United Kingdom, and a few other advanced economies, matched by corresponding surpluses in many emerging markets and a few oil-exporting economies. Rising saving rates in China and many other Asian economies began to receive increased attention from researchers around this period, and Federal Reserve Chairman Ben Bernanke's 2005 speech arguing that the "savings glut" in emerging markets was a proximate cause of the imbalances gave further impetus to that research.[1]

Economists have been more successful in explaining changes in saving rates within specific countries over time than in explaining differences in saving levels across countries.[2] The fact that Asian economies traditionally have had higher saving rates than developing and industrialized economies in other regions has received some attention, but there is no persuasive explanation for this phenomenon. Economists have had to rely on weak non-economic explanations, such as the argument that Asians are culturally predisposed towards saving. This hypothesis has been formally tested using data from the U.S. Census to examine whether immigrants to the United States from high-saving countries tend to save more than immigrants from low-saving countries. The results show that there are significant differences in immigrants' saving behavior by country of origin, but those differences do not match up with the differences in national saving rates. In particular, immigrants from high-saving Asian countries do not save more than other immigrants.[3]

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Saving in Asia

Given their high and rising saving rates, Asian economies have been the subject of considerable research. In an early contribution focusing on the region, Susan Collins looks at rising national saving rates in nine Asian developing economies (plus Turkey) over the period 1960–84. She concludes that high growth rates, a low dependency ratio, and high income levels are all positively associated with saving rates. She argues further that there are structural differences between low-income and middle-income countries in the determinants of savings.[4]

Charles Horioka and Akiko Terada-Hagiwara find that domestic saving rates in developing Asia rose during the period 1966–2007. They conclude that the main determinants of those trends were the age structure of the population (especially the elderly dependency ratio), income levels, and the level of financial sector development.[5] They forecast that over the next two decades the domestic saving rate in developing Asia as a whole will remain roughly constant, despite rapid population aging in most of those economies, in part because the negative impact of population aging on the domestic saving rate will be largely offset by the positive impact of higher income levels.

National saving comprises saving by households, corporations, and the government. Household savings typically has attracted most of the attention of researchers because it is more amenable to theoretical modeling than the other components of nations saving, and because its determinants can be analyzed using

household-level survey data. Corporate saving (retained earnings) has received less attention, but in fact has been the key driver behind the surge in national savings in major Asian emerging markets during the latter half of the last decade.[6]

While household saving rates have also trended up in most major Asian economies, one prominent Asian economy where the household saving rate has fallen quite significantly over the last two decades is Korea. Young Jun Chun evaluates the effects of population aging and fiscal policies on national saving in Korea.[7] Using a life-cycle model that incorporates a generational accounting approach, he argues that rapid population aging and the long-term budgetary imbalance have and will continue to drive down the national saving rate in Korea.

China

The sheer scale of China's saving, which now exceeds 50 percent of GDP, has drawn considerable research attention. Dennis Yang, Junsen Zhang, and Shaojie Zhou look at determinants of all three components of saving in China and conclude that economic, demographic, and policy trends in the internal and external environments of the Chinese economy are likely to lead to a decline in national saving in the foreseeable future.[8]

With greater access to household-level datasets, there has been an intense focus on explaining the rise in China's household saving rate. From 1995 to 2005, the average urban household saving rate in China rose steadily by 7 percentage points, to about one quarter of disposable income. The urban saving rate has continued to rise since then, driving the national household saving rate higher as well. Marcos Chamon and I use data from China's Urban Household Surveys to explain why households are postponing consumption despite rapid income growth. [9] Tracing cohorts over time indicates a virtual absence of consumption smoothing over the life cycle. Saving rates have increased across all demographic groups, although the age profile of savings has an unusual pattern in recent years, with younger and older households having relatively high saving rates. We argue that these patterns are best explained by the rising private burden of expenditures on housing, education, and health care. These effects and precautionary motives may have been amplified by financial underdevelopment, as reflected in constraints on borrowing against future income and low returns on financial assets.

In subsequent work, Chamon, Kai Liu, and I examine the role of precautionary saving motives in explaining both the increase in China's household saving rate since the mid-1990s and the interesting fact that the age-savings profile has become U-shaped during the 2000s.[10] We find that, in addition to the factors identified in our earlier research, rising income uncertainty and pension reforms help to explain both of these phenomena. Using a panel of Chinese households covering the period 1989–2006, we document that strong average income growth has been accompanied by a substantial increase in income uncertainty. Interestingly, the permanent variance of household income remains stable while it is the transitory variance that rises sharply. A calibration of a buffer-stock savings model indicates that rising savings rates among younger households are consistent with rising income uncertainty and that higher saving rates among older households are consistent with a decline in the pension replacement ratio for those retiring after 1997. We conclude that rising income uncertainty and pension reforms can explain more than half of the increase in the urban household savings rate in China since the mid-1990s, as well as the U-shaped age-saving profile.

Other researchers have used less disaggregated data to provide complementary perspectives on household saving behavior. Horioka and Junmin Wan conduct a dynamic panel analysis of the determinants of the household saving rate in China using a life-cycle model and panel data on Chinese provinces for the period 1995–2004.[11] They find that the main determinants of variations over time and over space are the lagged saving rate, the income growth rate, (in many cases) the real interest rate, and (in some cases) the inflation rate. They find little evidence that variables relating to the age structure of the population have the expected impact on the household saving rate. Their results provide mixed support for the life-cycle hypothesis and the permanent income hypothesis, and are consistent with the existence of inertia or persistence in household saving behavior.

Other research on China has emphasized demographic factors as one of the main determinants of the rising household saving rate. Chadwick Curtis, Steven Lugauer, and Nelson Mark undertake a quantitative investigation using an overlapping-generations model.[12] In their model, dependent children's utility enters into parents' utility so that parents choose the consumption level of the young until they leave the household. Working agents give a portion of their labor income to their retired parents and save for their own retirement, while the aged live on their accumulated assets and on support from their children. These researchers take future demographic changes, labor income, and interest rates as exogenously given. They argue that their calibrated model accounts for much of observed increase in the household saving rate from 1963 to 2009.

While evidence of conventional demographic factors, such as an aging population, in driving household saving rates has been mixed, there are other aspects of changing demographics in China that have been the subject of research as well. Shan-Jin Wei and Xiaobo Zhang propose a novel and unorthodox explanation based on competitive saving resulting from unbalanced sex ratios (tilted in favor of males) in China.[13] As the sex ratio rises, Chinese parents with a son raise their savings in a competitive manner in order to improve their son's relative attractiveness for marriage. The pressure on savings spills over to other households. Both cross-regional and household-level evidence supports this hypothesis. They conclude that this motive potentially can account for about half of the actual

increase in the household savings rate during 1990–2007.

Abhijit Banerjee, Xin Meng, and Nancy Qian exploit the changes in China's demographics caused by its family planning policies to study the effects of changes in the demographic structure on savings and wealth.[14] They find that children provide a substantial amount of support for elderly parents and that sons provide more support than daughters. Their empirical estimates support the predictions of a simple life-cycle model, based on which they conclude that the exogenous reduction in fertility because of family planning policy caused a significant increase in household savings, and that all of the increase is driven by parents who have a daughter as their only child.

Corporate Savings

As in other Asian economies, corporate saving was a principal driver of the rising national saving rate in China.[15] During 2003–7, the share of household saving in GDP actually declined, even though the household saving rate (saving as a share of disposable income) continued to rise. This apparent anomaly is the consequence of a greater share of national income going to capital than to labor. If households effectively own the firms in an economy, either directly or indirectly, this should not matter because firms' profits will increase household disposable income. However, in China, a majority of firms are still state-owned and most of them don't pay dividends to the state.

China's high corporate saving rate has received attention in policy circles, but has been the subject of only limited research so far. Tamim Bayoumi, Hui Tong, and Wei examine firm-level data and conclude that it indicates a global trend of rising corporate saving over the period 2002–7.[16] Chinese state-owned firms only recently were required to pay out dividends to the state, and these payments are still quite low relative to profits. However, these authors conclude that there is no significant difference in the savings behavior and dividend patterns between Chinese majority state-owned and private listed firms. Other evidence reported by Loukas Karabarbounis and Brent Neiman suggests that China is not special and that declining labor shares and the rise of corporate saving are global phenomena.[17] One factor behind these phenomena is the global decline in the cost of capital beginning in the 1980s, which has led firms around the world to shift away from labor and towards capital, financed in part with an increase in corporate saving.

More Work Ahead

With developing economies playing an increasingly important role in the global economy, there is growing interest in explaining saving behavior in these economies from both micro and macro perspectives. Increase in access to household and firm-level datasets in China and other developing economies has set off an exciting research program, although a number of questions have not yet been conclusively answered. For instance, the micro evidence suggests a range of plausible explanations for the rise in China's household saving rate, although there is no easy way to distinguish among these different hypotheses in a unified framework. Integrating the micro and macro perspectives to explain the determinants of saving-investment balances in these countries is likely to remain a fertile area of research.

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[14] *A. Banerjee, X. Meng, and N. Qian, "The Life Cycle Model and Household Savings: Micro Evidence from Urban China," forthcoming as an NBER Working Paper.*
[15] *E.S. Prasad, 2011 (op. cit. endnote 7)*
[16] *T. Bayoumi, H. Tong, and S. Wei, "The Chinese Corporate Savings Puzzle: A Firm-level Cross-Country Perspective," NBER Working Paper No. 16432, October 2010.*
[17] *L. Karabarbounis and B. Neiman, "Declining Labor Shares and the Global Rise of Corporate Saving," NBER Working Paper No. 18154, June 2012.*

The Effect of Climate Change and Biofuel Mandates on Agricultural Output and Food Prices

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The four staple commodities — maize, soybeans, rice, and wheat — account for roughly 75 percent of the world's caloric consumption, either directly as food or indirectly in the form of feedstock for animals. The U.S. share of global caloric production in those four commodities is 23 percent, about three times Saudi Arabia's market share in oil production. Of particular importance is U.S. maize (sometimes also called corn), the country's largest crop, accounting for 10 percent of global caloric production. Given its market share, any policy or shock that affects U.S. maize production has worldwide ramifications for commodity prices, which move together because they are close substitutes.

While agriculture constitutes a small fraction of U.S. GDP, it is responsible for a large part of consumer surplus because agricultural demand is highly inelastic. The tripling of commodity prices between 2005 and 2008 reduced global consumer surplus from the four basic commodities by approximately 1.25 trillion dollars annually. While various causes have been mentioned as possible driving forces behind the recent price increase, my past research has focused on two of them: the effects of weather on agricultural yields and the effect of biofuel mandates on food prices.

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The Effects of Weather/Climate on Yields

Agricultural production, except for some specialty crops that are grown in greenhouses, depends directly on weather. Because weather is predicted to change over the next century, one natural question is how that will affect agricultural production and prices.

a) Extreme heat and crop yields

Michael Roberts and I linked a county-level panel of corn and soybean yield, the two largest crops in the United States, as well as cotton, a warm weather-crop, to a fine-scale dataset of weather outcomes that explain the distribution of temperatures within each day.[1] Yields increase linearly in temperatures up to 29°C (84°C) for corn, 30°C (86°F) for soybeans, and 33°C for cotton — above that, further temperature increases become harmful. The relationship above the threshold is again linear, but the slope of the decline above the optimum is an order of magnitude steeper than the incline below it: that is, being 1 degree above the optimum for ten days has the same effect as being 10 degrees above the optimum for one day. Both decrease annual maize yields by 6 percent. Note, however, that we are incorporating the entire temperature distribution within a day, and the largest fraction of a day is usually below the threshold. It takes several days with a maximum above the threshold to obtain a 24-hour exposure period above the threshold.

Most U.S. counties are expected to suffer yield declines under climate change. The predicted increase in the frequency of temperatures above the threshold accounts for the largest share of the estimated effect on yield, and trumpets the effect of temperature changes below the threshold, as well as precipitation changes.

Adaptation to extreme heat seems difficult or prohibitively costly. We obtain the same statistical sensitivity to extreme heat whether we look at the panel, a pure time-series linking annual overall U.S. yields to weather, or a cross-section linking aver-

age yields in a county to average weather outcomes (climate in a location). In other words, the difference in average productivity explained by differences in climate shows the same sensitivity as the sensitivity of yields in a given place to year-to-year weather fluctuations. It would seem that farmers who repeatedly face higher temperatures should have more of an incentive to adapt to these high temperatures than farmers who face a one-time weather shock, yet the effects are the same empirically. In a different study, Anthony Fisher, Michael Hanemann, and I find a comparable sensitivity to extreme heat in the cross-section of U.S. farmland values, which includes as an adaptation strategy switching between crops.[2]

The crucial importance of extreme heat is also consistent with underlying agronomic models of crop growth: high temperatures decrease the water supply (through evaporation or plant transpiration) and at the same time increase the water demand to sustain a given level of carbon uptake, affecting both the supply and the demand for water. On the other hand, precipitation only affects the water supply. My co-authors and I use the agronomic crop model APSIM to examine the exact mechanism.[3] APSIM suggests that extreme temperatures do not affect the plant itself through heat stress, but rather through increased vapor pressure deficit (water stress). The sensitivity to extreme heat in APSIM is comparable to statistical studies of observed crop yields.

b) Evolution of heat sensitivity over time

We find no evidence for adaptation in hotter places, but one might wonder whether there has been progress in heat tolerance over time. *Average* yields have tripled between 1950 and 2005, yet Roberts and I find that *sensitivity* to extreme heat is among the highest around 2005 and again roughly comparable in hot and cold climates (which had very different incentives to adapt to extreme heat events).[4] In a longer time-series for Indiana that starts in 1901, we find some improvement in heat tolerance after hybrid corn was introduced in the 1930s, but heat tolerance started to deteriorate again once growers switched from double-crossed hybrid corn to single-crossed hybrid corn in the 1960s. Going forward, the predicted increases in temperature would result in significant yield losses using today's corn varieties.

c) The 2012 U.S. heat wave

Some breeding companies have claimed that the latest corn varieties have improved heat and drought tolerance. The year 2012, which had the second-largest exposure to temperatures above 29°C since 1950 and was the second driest year, offers a test of how well the new crop varieties can handle heat and drought. One unique feature of 2012 was that the heat wave was concentrated in the month of July. Steven Berry, Roberts, and I estimate a new county-level panel that allows the effect of extreme temperatures to evolve over the growing season.[5] Corn is most sensitive to hot temperatures around a third of the way into the growing season, which coincides with flowering. Since the 2012 heat wave hit the most productive corn growing area in the United States during the time when it was most vulnerable, a model that allows the effect of extreme heat to vary over the growing season yields larger damages than a standard model that assumes the effect to be homogenous across the entire season. More importantly, though, predicted yield declines under both the standard and the revised model are less severe than the preliminary yield forecasts for 2012, suggesting that the statistical model does not exaggerate the damaging effects of extreme heat as recent as 2012. Going forward, climate models suggest that the 2012 temperature outcomes will be a below-average year by mid-century as the temperature distribution shifts upward.

d) Observed climate trends

The last three decades have seen increasing temperatures in many parts of the world. David Lobell, Justin Costa-Roberts, and I estimate country and crop-specific temperature and precipitation trends for 1960–80 for the four major staple commodities.[6] We find that the distribution of trends is indistinguishable from a placebo when we repeatedly estimate trends for random draws from a stationary time-series of the same length. The picture changes dramatically for 1980-2008: observed temperature trends are generally positive and are shifted to the right of the placebo: most parts of the world have experienced warming trends that cannot be attributed to statistical noise. One notable exception is the United States.

In a second step, we estimate a panel linking yields to observed weather outcomes. We compare predicted yields under the observed weather outcomes to a counterfactual where we subtract the observed trends. Global caloric production is predicted to have been 3 percent less than what it would have been without the observed climate trends, which implies a roughly 20 percent increase in commodity prices. The next section outlines how we translate quantity changes into price changes.

U.S. Policies and the Effect of Food Prices

a) Biofuel policies

The 2009 U.S. Renewable Fuel standard diverted a third of U.S. maize production into ethanol. Given the U.S. share of global maize production, this translates into 5 percent of combined caloric production of the four staple commodities. By comparison, global production shocks (deviations from a trend) ranged from -5.7 percent to +4.4 percent in 1961–2010 as country and crop-specific weather shocks averaged out. The U.S. ethanol mandate diverts as many calories from the world market *every year* as the worst observed supply shock in the last fifty years. Given the size of this market intervention, it can be expected to significantly affect global commodity prices.

The size of the price increase depends on the demand and supply elasticities for staple commodities. Roberts and I develop a novel framework for identifying the elasticities of storable commodities.[7] Concurrent supply shocks have been used as exogenous shifters since P. G. Wright invented instrumental variables.

Following a similar logic, to identify a supply response we can use *past* shocks, which affect inventory levels that link production and price levels between periods, as an instrument for futures prices in the next period.

We find a supply elasticity of 0.11 that is roughly twice the absolute magnitude of the demand elasticity of -0.055. The equilibrium price of calories is predicted to increase by 30 percent because of the outward shift in the demand for calories to meet the ethanol mandate. Two-thirds of the calories required to meet the ethanol mandate will come from new supply, while one-third will come from reductions in the demand for calories, which correspond to the caloric equivalent of feeding 132 million people for one year on a 2000 calorie/day diet. In case one third of the calories used in ethanol production can be recycled as feedstock, the numbers rescale accordingly, that is, the price increase would be 20 percent.

b) Pollution reduction and yield gains

Current work in progress with Christopher Boone and Juha Siikamäki examines one factor that contributed to the observed increase in average maize yields: reduction in peak ozone levels.[8] Roughly half of the observed trend in U.S. maize yields in 1993–2011 can be attributed to reduction in ozone, one of the ambient air pollutants regulated under the Clean Air Act. We construct a daily pollution surface over the Eastern United States and use it as an explanatory variable in a panel of U.S. maize yields, while also accounting for weather and other pollution variables. We find a critical threshold of 72ppb in hourly ozone readings. Pollution fluctuations below the threshold have no significant effect on annual maize yields, but yields decrease linearly in hourly ozone levels above 72ppb. The current U.S. ambient standard is set at 75ppb, which is fairly close to our estimated threshold, but the U.S. standard is based on the highest consecutive 8hr average in a day, which can hide hourly spikes. Hourly ozone levels above 72ppb have been declining steadily between 1993 and 2011 and are currently close to zero, suggesting that further pollution reduction will no longer boost maize yields.

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1 *W. Schlenker and M. J. Roberts, "Estimating the Impact of Climate Change on Crop Yields: The Importance of Nonlinear Temperature Effects," NBER Working Paper No. 13799, February 2008, published as "Nonlinear temperature effects indicate severe damages to U.S. crop yields under climate change,"* Proceedings of the National Academy of Sciences, *106(37) (2009): pp.15594–8.*

2 *W. Schlenker, W. M. Hanemann, and A.C. Fisher, "The Impact of Global Warming on U.S. Agriculture: An Econometric Analysis of Optimal Growing Conditions,"* Review of Economics and Statistics, *88(1) (2006): pp.113–25.*

3 *D.B. Lobell, G. L. Hammer, G. McLean, C. Messina, M. J. Roberts, and W. Schlenker, "Understanding the Critical Role of Extreme Heat for Maize Production in the United States,"* Nature Climate Change, *forthcoming.*

4 *M. J. Roberts and W. Schlenker, "Is Agricultural Production Becoming More or Less Sensitive to Extreme Heat? Evidence from U.S. Corn and Soybean Yields" NBER Working Paper No. 16308, August 2010.*

5 *S. T. Berry, M. J. Roberts, and W. Schlenker, "Corn Production Shocks in 2012 and Beyond: Implications for Food Price Volatility," NBER Working Paper No. 18659, December 2012.*

6 *D. B. Lobell, W. Schlenker, and J. Costa-Roberts, "Climate Trends and Global Crop Production Since 1980,"* Science, *333(6042) (2011): pp. 616–20.*

7 *M.J. Roberts and W. Schlenker, "Identifying Supply and Demand Elasticities of Agricultural Commodities: Implications for the US Ethanol Mandate," NBER Working Paper No. 15921, April 2010, and* American Economic Review, *forthcoming.*

8 *C. Boone, W. Schlenker, and J. V. Siikamäki, "The Effect of Ground-level Ozone on US Maize Yields," Working Paper, January 2013.*

NBER Profile: *Viral Acharya*

Viral Acharya is a Research Associate in the NBER's Program on Corporate Finance and the C.V. Starr Professor of Economics in the Department of Finance at New York University's Stern School of Business.

He received his Bachelor of Technology in Computer Science and Engineering from Indian Institute of Technology, Mumbai, in 1995 and his Ph.D. in Finance from NYU-Stern in 2001. He was a Professor of Finance at the London Business School from 2001–8 prior to joining the Stern faculty.

Acharya's primary research interest is analysis of systemic risk in the financial sector. This involves several topics, including credit risk and liquidity risk, their interactions and agency-theoretic foundations, and their consequences for general equilibrium.

In 2011 Acharya received the inaugural Banque de France-Toulouse School of Economics Junior Prize in Monetary Economics and Finance. He is also one of four co-authors of *Guaranteed to Fail: Fannie Mae, Freddie Mac and the Debacle of Mortgage Finance,* which was published by Princeton University Press in March 2011.

Acharya lives in New York with his wife, Manjiree, and son, Siddhant. His hobbies include singing and composing semi-classical Indian music, running, and cricket. He has raised funds in the United States and the United Kingdom over a period of ten years for providing education to under-privileged children in India.

NBER Profile: *Leah Platt Boustan*

Leah Platt Boustan is a Research Associate in the NBER's Programs on the Development of the American Economy and Education. She is also an associate professor of Economics at the University of California, Los Angeles. Her academic interests lie at the intersection between economic history, labor economics, and urban economics. Her research focuses on the Great Black Migration from the rural south during and after World War II, and the mass migration from Europe to the United States in the late nineteenth and early twentieth centuries.

Boustan received her A.B. in Economics from Princeton University in 2000 and her Ph.D. in Economics from Harvard University in 2006. She joined the UCLA economics department in 2006 as an assistant professor and was promoted to her current position in 2012. She is also a Research Associate at the California Center for Population Research.

Boustan currently holds an Alfred P. Sloan Research Fellowship. In the 2013–14 academic year, she will be a Straus Fellow at the New York University School of Law on the theme of "Racial, Ethnic and Economic Segregation."

Boustan lives in Los Angeles with her husband, Ra'anan. Over the past few years, she has been practicing blues lead guitar on her Gibson Les Paul. She also enjoys going to hear live music of all genres and singing karaoke.

NBER Profile: *David Card*

David Card directs the NBER's Program on Labor Studies and is the Class of 1950 Professor of Economics at the University of California, Berkeley. He received his B.A. in economics from Queen's University (Kingston, Ontario) in 1978 and his Ph.D. in economics from Princeton University in 1983. He taught at Princeton University from 1983 to 1996, and has held visiting appointments at Columbia and Harvard Universities and the Center for Advanced Study in the Behavioral Sciences.

His current research interests include wage inequality, immigration, education, and the evaluation of social programs. He has also worked on minimum wages, labor supply, unemployment, and the effects of trade unions. He has co-edited two NBER volumes focused on comparative labor market institutions, and was the co-editor of volumes 2–4 of the *Handbook of Labor Economics.*

In 1992 Card was elected a fellow of the Econometric Society, and in 1998 he was elected to the American Academy of Arts and Sciences. In 1995 he received the American Economic Association's John Bates Clark Prize, which is awarded to the economist under age 40 whose work is judged to have made the most significant contribution to the field. He was a co-recipient of the IZA Labor Economics Award in 2006, and was awarded the Frisch Medal by the Econometric Society in 2007.

Card lives in Berkeley and Sonoma County with his wife, Cindy. His hobbies include antique tractors and furniture making.

NBER Profile: *Eswar Prasad*

Eswar Prasad is a Research Associate in the NBER's International Finance and Macroeconomics Program and the Tolani Senior Professor of Trade Policy and Professor at Economics at Cornell University. He is also a Senior Fellow at the Brookings Institution, where he holds the New Century Chair in International Economics.

Prasad received a B.A. from the University of Madras (India), an M.A. from Brown University, and his Ph.D. from the University of Chicago. He is the author or editor of several monographs and books on financial regulation, China, and India. His research interests include international finance, business cycles, monetary policy, and emerging market economies.

Prasad and his wife Basia have two daughters, Berenika and Yuvika.

NBER Profile: *Wolfram Schlenker*

Wolfram Schlenker is a Research Associate in the NBER's Program on Environmental and Energy Economics. He has been on the faculty at the University of California, Berkeley, Columbia University, and the University of California, San Diego. He was also a visiting scholar at Stanford University, a Visiting Researcher at Princeton University, and a Gilbert White Fellow at Resources for the Future.

Schlenker received his B.S. in Engineering and Management Science from the University of Karlsruhe (Germany) in 1995, his Master of Environmental Management at Duke University in 1998, and his Ph.D. in Agricultural and Resource Economics from Berkeley in 2003.

He grew up in Stuttgart (Germany) and now lives in Oakland, CA with his wife, Sophie, and their two-month old daughter, Maya. In his free time, he likes to run, hike, and attend performing art events.

Conferences

Fourteenth Annual Conference in India

On December 14–16, 2012 the NBER, along with India's National Council for Applied Economic Research (NCAER) and the Indian Council for Research on International Economic Relations (ICRIER), sponsored a meeting that included NBER researchers as well as economists from Indian universities, research institutions, and government departments. NBER Research Associates **Abhijit Banerjee** of MIT and **Raghuram Rajan** of the University of Chicago organized the conference jointly with **Shekhar Shah** and **Anil Sharma** of NCAER.

The NBER participants, in addition to the organizers, were: **Nick Bloom**, Stanford University; **Markus Brunnermeier**, Princeton University; **Ricardo Caballero** and **Heidi Williams**, MIT; **Douglas Diamond**, University of Chicago; **Martin Feldstein,** Harvard University; **Daniel Fetter**, Wellesley College; **Pinelopi Goldberg**, Yale University; **Anne Krueger**, Johns Hopkins University; and **Karthik Muralidharan**, University of California, San Diego. NBER Directors Jacob Frenkel of JP Morgan Chase and John Lipsky of Johns Hopkins University also participated in the meeting.

The topics discussed included the prospects for financial regulatory reform;the role of media in governance; India's position in the world economy; the determinants of long-term productivity growth; and the economic consequences of urbanization.

NBER's Africa Project Confers Again

The NBER Africa Project, organized by Research Associates Sebastian Edwards of the University of California, Los Angeles, Simon Johnson of MIT, and David Weil of Brown University brought together academic economists and East African policymakers in Zanzibar on December 18–19, 2012 for a policy-oriented discussion on "Meeting the Next Macroeconomic Challenges in Africa." This conference was sponsored in collaboration with the Bank of Tanzania. The following topics were discussed:

- **Robert Lawrence**, Harvard University and NBER, "Regional Integration: What Does Europe Teach Us?"
- **Stephen O'Connell**, Swarthmore College, "Fiscal Foundations of Monetary Union in East Africa"
- **Christopher Adam**, Oxford University, "East African Transport Costs in the Short-run and the Long-run"
- **S. Kal Wajid**, IMF, "Financial Integration in the East African Community"
- **Alan Taylor**, University of Virginia and NBER, "The Great Leveraging"
- **Simon Johnson**, "The Next Financial Crisis"
- **Jeffrey Frankel,** Harvard University and NBER, "Dealing with the Resource Curse: How Can Commodity Exporters Reduce Procylicality?"
- **Andrew Berg**, IMF, "The Macroeconomic Management of External Resources"

More information about this meeting is available at: http://conference.nber.org/confer/2012/ADSf12/summary.html

Economics of Digitization

An NBER Conference on the Economics of Digitization took place at Stanford University on March 8, 2013. NBER Research Associates Shane Greenstein of Northwestern University's Kellogg School of Management, Josh Lerner of the Harvard Business School, and Scott Stern of MIT's Sloan School of Management organized the meeting. These papers were discussed:

- **Miguel Godinho de Matos, Pedro Ferreira**, **Rahul Telang**, and **Michael Smith**, Carnegie Mellon University, "The Impact of Popularity on the Sales of Movies in Video-on-Demand: a Randomized Experiment"
- **Ruben Enikolopov**, **Maria Petrova**, and **Konstantin Sonin**, New Economic School, "Do Political Blogs Matter? Corruption in State-controlled Companies, Blog Postings, and DDoS Attacks"
- **Garrett Johnson**, Northwestern University, and **Randall Lewis** and **David Reiley, Jr.**, Google, Inc., "Location, Location, Location: Proximity and Repetition Increase Effectiveness of Display Ads in Controlled Experiments"
- **Tom Blake** and **Steven Tadelis**, eBay Research Labs, and **Chris Nosko**, University of Chicago, "Consumer Heterogeneity and Paid Search Effectiveness: A Large Scale Field Experiment"
- **Joel Waldfogel**, University of Minnesota and NBER, and **Imke Reimers**, University of Minnesota, "Storming the Gatekeepers: Digital Disintermediation in the Market for Books"

- **Peter DiCola**, Northwestern University, "Money from Music: Survey Evidence on Musicians' Revenue and Lessons about Copyright Incentives"

- **Avi Goldfarb and Brian Silverman**, University of Toronto; **Ryan McDevitt**, University of Rochester; and **Sampsa Samila**, National University of Singapore, "The Effect of Social Interaction on Economic Transactions: An Embarrassment of Niches?"

Summaries of these papers are available at: http://www.nber.org/confer/2013/EoDs13/summary.html

Economics of Religion and Culture

An NBER Conference on "Economics of Religion and Culture," organized by Research Associate Daniel Hungerman of University of Notre Dame, took place in Cambridge on March 8 and 9, 2013. These papers were discussed:

- **Thomas Triebs** and **Justin Tumlinson**, Ifo Institute for Economic Research at the University of Munich, "Learning Capitalism the Hard Way — Evidence from Germany's Reunification"

- **Saumitra Jha** and **Aprajit Mahajan**, Stanford University, "Trade, the State, and Inter-Religious Trust: Evidence from South Asia"

- **Asaf Zussman**, Hebrew University, "The Effect of Political Violence on Religiosity: Evidence from Israel"

- **Elaine Liu**, University of Houston; **Juanjuan Meng**, Peking University; and **Tao-Yi Wang**, National Taiwan University, "Confucianism and Preferences: Evidence from Lab Experiments in Taiwan and China"

- **Angela Dills** and **Rey Hernandez-Julian**, Metropolitan State University of Denver, "Religiosity and State Welfare"

- **Daniel Chen**, ETH Zurich, and **Susan Yeh**, George Mason University, "How Do Rights Revolutions Occur? Theory and Evidence from First Amendment Jurisprudence, 1958–2008"

- **Sanjeev Kumar**, Yale University, and **Jason Fletcher**, Yale University and NBER, "Religion and Risky Health Behaviors among U.S. Adolescents and Adults"

- **Daniel Hungerman**, "The Effect of Education on Religion: Evidence from Compulsory Schooling Laws"

- **Sonia Bhalotra**, University Bristol; **Guilhem Cassan**, University of Namur; **Irma Clots-Figueras**, Universidad Carlos III Madrid; and **Lakshmi Iyer**, Harvard University, "Politician Identity and Health Outcomes: Does Religion Matter?"

Summaries of these papers may be found at: http://www.nber.org/confer/2013/RCs13/summary.html

2012 Awards and Honors

A number of NBER researchers received honors, awards, and other forms of professional recognition during 2012. A list of these honors, which excludes those that were bestowed by the researcher's home university, is presented below.

Viral Acharya received the inaugural Banque de France-Toulouse School of Economics Junior Prize in Monetary Economics and Finance. He received the National Stock Exchange of India Best Paper Award for "Sovereign Debt, Government Myopia and the Financial Sector" (with **Raghuram Rajan**). "Liquidity Risk of Corporate Bond Returns" (co-authored by Yakov Amihud and Sreedhar Bharath) received Second Prize for the Cromwell Award given by Pan Agora Asset Management. He was also named a Director of the Western Finance Association.

Lee Alston won the Cliometric Society's Award for "Exceptional Service to the Field of Cliometrics."

Andrew Ang and **Dimitris Papanikolaou** won second prize in the Roger F. Murray Prize Competition.

Jeremy Atack served as President of the Economic History Association. He was also elected a Fellow of the Cliometric Society.

David Autor was elected to the American Academy of Arts and Sciences.

Katherine Baicker received the Impact Award from AcademyHealth for her work on the Oregon Health Insurance Experiment. She also was named to the Board of Directors of Eli Lilly, and began serving as Chair of the NIH's SSPS Study Section.

Richard Baldwin was awarded an Honorary Doctorate from the University of St.Gallen, Switzerland.

Marianne Bertrand (and **Adair Morse**) won the Brattle Group Prize for "Information Disclosure, Cognitive Biases and Payday Borrowing." She also became a Fellow of the American Academy of Arts and Sciences and of the Society of Labor Economists, and won that Society's Rosen Prize for Outstanding Contributions to Labor Economics.

Javier Bianchi received the National Prize in Economics in Uruguay, awarded by Universidad de la Republica, for "Efficient Bailouts?"

Alberto Bisin became a Fellow of the Econometric Society.

Jeffrey Brown and **Scott Weisbenner** shared the BlackRock Research Award at the 25th Australasian Finance and Banking Conference in December 2012.

Richard Burkhauser (along with Jeff Larrimore and **Kosali Simon**) won the 2012 Richard Musgrave Prize for the best paper published in the *National Tax Journal* for "A Second Opinion on the Economic Health of the American Middle Class and Why it Matters in Gauging the Impact of Government Policy."

Charles Calomiris received an Honorary Doctorate from the University of Basel for his achievements in the fields of banking history, banking regulation, and financial fragility.

John Campbell gave the Keynote Address at the Society for Financial Econometrics in Oxford, England; the Morgan Stanley Lecture at the New Economic School in Moscow; the Purvis Lecture at the Canadian Economic Association in Calgary; and the David Kinley Lecture at the University of Illinois.

Scott Carrell and Mark Hoekstra won the IZA (Institute for the Study of Labor) Young Labor Economist Award.

Alessandra Casella was awarded a fellowship at the Straus Institute, NYU Law School.

Amitabh Chandra was elected to the National Academies' Institute of Medicine. He also was awarded the American Society of Health Economics medal recognizing the outstanding economist under age 40. He delivered the George Burch Lecture to the Association of University Cardiologists, and became Editor of the *Review of Economics and Statistics*.

Hui Chen won the Smith Breeden Distinguished Paper Prize for "Macroeconomic Conditions and the Puzzles of Credit Spreads and Capital Structure."

Janet Currie is the 2013 Eleanor Roosevelt Fellow of the American Academy of Political and Social Science and a Phi Beta Kappa Visiting Scholar. She was also named one of 100 "Alumni of Influence" by University College, University of Toronto, and she was elected Vice President of the Society of Labor Economists.

Raj Chetty received the MacArthur Foundation Fellowship and was elected a Fellow of the Econometric Society.

Philip Cook was elected Fellow of the Academy of Experimental Criminology.

Mario Crucini was elected President of the International Economics and Finance Society and was selected to serve on the Editorial Board of the *Pacific Economic Review*.

Angus Deaton won the BBVA Frontiers in Knowledge Award in Economics, Finance, and Management. He also was awarded an honorary doc-

torate in economics by the University of Cyprus.

Rajeev Dehejia and Sadek Wahba's paper, "Propensity Score Matching Methods for Non-Experimental Causal Studies" was selected among 50 Influential Articles published by MIT Press over the last 50 years in the fields of Arts and Humanities; Economics; International Affairs, History, and Political Science; and Science and Technology.

Jan De Loecker received the Kiel Institute's Excellence Awards in Global Economic Affairs for significantly contributing to expanding the knowledge base in global economic research.

Francis Diebold won the Kulp-Wright Award from the American Risk and Insurance Association for the best book on the economics of risk, *The Known, the Unknown and the Unknowable*. He was also elected a Fellow of the International Institute of Forecasters and is serving as President of the Society for Financial Econometrics.

Susan Dynarski testified before the U.S. Senate Finance Committee on her work in the field of higher education.

Sebastian Edwards was awarded the Carlos Diaz-Alejandro Prize by the Latin American and Caribbean Economics Association in October 2012. His lecture, delivered on that occasion, was titled "Economists as Storytellers."

William Easterly received the Adam Smith Award from The Association of Private Enterprise Education.

Roger Farmer will be the Senior Houblon Norman Fellow at the Bank of England.

Amy Finkelstein received the John Bates Clark Medal from the American Economic Association. She was also elected a Fellow of the American Academy of Arts and Sciences and the Econometric Society.

Price Fishback was selected as a Fellow of the Cliometric Society, a group of quantitative economic historians. He also was elected Executive Director of the Economic History Association.

Jason Fletcher was awarded a William T. Grant Foundation Scholars Award, a five-year Career Development Award to pursue his project entitled "Interconnected Contexts: The Interplay Between Genetics and Social Settings in Youth Development."

Jeffrey Frankel received the Abramson Scroll from the National Association for Business Economics for his article "What Small Countries Can Teach the World."

Xavier Gabaix received the Lagrange Prize, given by the CRT Foundation for research on complex systems. He also received a Rising Star in Finance Award.

Jordi Gali received the Research National Prize, awarded by the Government of Catalonia. He also served as President of the European Economic Association.

Claudia Goldin served as President-elect of the American Economic Association. She will assume the post of president at the Society's Annual Meeting in January 2013.

Robert Gordon was the keynote speaker at the 25th Annual Villa Mondragone Conference hosted by Rome's Tor Vergata University. He was also keynote speaker at a London conference on the "Future of Europe."

Gene Grossman received the Bernard Harms Prize from the Kiel Institute for the World Economy. The biennial Prize — named after the founder of the Kiel Institute —honors scholars with a distinguished record in the field of international economics.

Michael Grossman was appointed to the Editorial Board of *Economics and Human Biology*.

Paola Giuliano was chosen as one of the Visiting Scholars at the Russell Sage Foundation. She was also nominated associate editor for the *Journal of the European Economic Association*.

Oliver Hart was awarded the Doctor of Laws, Honoris Causa, from the University of Warwick.

Zhiguo He received the Smith-Breeden First Prize for "Rollover Risk and Credit Risk," the Swiss Finance Institute's Outstanding Paper Award for "Macroeconomic Framework to Quantify Systemic Risk," and the Chinese Financial Association best paper award for "Uncertainty, Risk, and Incentives: Theory and Evidence."

Elhanan Helpman received the Onassis Prize and was elected Corresponding Fellow of the British Academy.

Garth Heutel won the the Ralph C. d'Arge and Allen V. Kneese Award for an Outstanding Publication in the *Journal of Environmental Economics and Management* for "Plant Vintages, Grandfathering, and Environmental Policy."

Bengt Holmstrom won the Banque de France-Toulouse School of Economics Senior Prize.

Hilary Hoynes was appointed to the Advisory Committee for the Directorate for the Social, Behavioral, and Economic Sciences at the National Science Foundation. She also delivered the Joe Tiao Lecture at Kansas State University and was a distinguished speaker in the series on "Deep Issues of the 2012 Elections" at Cornell University.

Oleg Itskhoki received an Excellence Award in Global Economic Affairs from the Kiel Institute for the World Economy.

Joseph Kaboski won the Frisch Medal from the Econometric Society with **Robert M. Townsend** for "A Structural Evaluation of a Large-Scale Quasi-Experimental Microfinance Initiative."

Sebnem Kalemli-Ozcan was selected as one of the three Inaugural fellows at the IMF.

Loukas Karabarbounis was awarded the Royal Economic Society Prize for the best paper published in the *Economic Journal* for "One Dollar, One Vote."

Robert Kaestner was named an NCHS Health Policy Fellow by the National Center for Health Statistics and AcademyHealth.

Edward Kane received the Thomas Divine Award for a Lifetime of Contributions to Social Economics and the Social Economy given by the Association for Social Economics.

Bryan Kelly won the AQR Insight

Award for his paper "Market Expectations in the Cross Section of Present Values", co-authored with Seth Pruitt. He also won the JP Morgan Award for Best Paper on Financial Institutions and Markets at the WFA Annual Meeting for "Too-Systemic-To-Fail: What Option Markets Imply About Sector-Wide Government Guarantees," co-authored with **Hanno Lustig** and **Stijn Van Nieuwerburgh**.

William Kerr won the Kauffman Prize Medal for distinguished research in entrepreneurship by a scholar under age 40 and the FPD Academy Award for Best Research at the World Bank regarding Finance and Private Sector Development.

Christian Leuz won a Humboldt Research Award. He (with Richard Lambert and Robert Verrecchia) also received the Spängler IQAM Best Paper Prize for "Information Precision, Information Asymmetry, and the Cost of Capital" published in the *Review of Finance*.

Jonathan Levin was selected as a Young Global Leader by the World Economic Forum.

Nuno Limao was an invited speaker for the Econometric Society Australasian Meeting.

Robert Lipsey posthumously received the Kendrick's Prize from the *Review of Income and Wealth* for the best macro paper in the journal in the past two years.

Andrew Lo was named one of the "Time 100" by Time magazine. He also delivered the 2012 Nash Distinguished Lecture at Carnegie-Mellon University.

Trevon Logan was elected President-Elect of the National Economic Association.

Jens Ludwig was elected to the Institute of Medicine of the National Academies of Science.

Kalina Manova won a Hoover Institution National Fellowship. She also received the Excellence Award in Global Economic Affairs, awarded by the Kiel Institute for World Economy to young economists who have made significant contributions to the study of globalization.

Robert Margo was elected a Fellow of the Cliometric Society, an award for career achievement in the field of economic history.

Ellen McGrattan was elected a Fellow of the Econometric Society.

Antonio Merlo was elected a Fellow of the Econometric Society.

Bruce Meyer received the Emerald Literati Network Award for Excellence for his paper "Consumption and Income Poverty Over the Business Cycle" (with James X. Sullivan), published in *Research in Labor Economics*.

Robert Moffitt was elected a Fellow of the American Academy of Arts and Sciences.

Adair Morse (with **Marianne Bertrand**) won the Brattle Group First Prize award at the American Finance Association meetings. She also won the Commonfund Prize for the best paper in asset management at the European Finance Association meetings.

Petra Moser was awarded an NSF CAREER grant for her work on patents and innovation, as well as a Fellowship at the Center for Advanced Studies in the Behavioral Sciences (CASBS).

Aldo Musacchio won the 2012 Gerry Feldman Prize for the Best Research Article Published by Young Scholars in the *Financial History Review* for "Endowments, Fiscal Federalism, and the Cost of Capital for States: Evidence from Brazil, 1891–1930" with André C. Martínez Fritscher. He also received the Manuel Espinosa Yglesias Prize for the best paper or book on banking, awarded by the Centro de Estudios Espinosa Yglesias, for his paper with Stephen Haber, "These Are the Good Old Days: Foreign Entry and the Mexican Banking System."

Lubos Pastor won the Smith Breeden Prize for the best paper on capital markets in the *Journal of Finance* for "Uncertainty about Government Policy and Stock Prices" co-written with **Pietro Veronesi**. He also received the Whitebox Advisors' Selected Research Prize for the best financial research of the year for "Are Stocks Really Less Volatile in the Long Run?" co-written with **Robert Stambaugh**.

Mark Pauly won the William B. Graham Prize for Health Services Research from the Baxter International Foundation and the Association of University Programs in Health Administration. He also received the Victor R. Fuchs Lifetime Achievement Award from the American Society of Health Economists, and is President-elect of the American Society of Health Economists.

Lasse Heje Pedersen won the Bernacer Prize for the Best European Union Economist under Age 40; the Michael Brennan Award for the Best Paper in the *Review of Financial Studies* for "Margin-Based Asset Pricing and Deviations from the Law of One Price," (with **Nicolae Garleanu**); the SFI Outstanding Paper Award for "Betting Against Beta"; and the Nykredit Research Prize. He was also elected to the Academia Europaea (the Academy of Europe).

Robert Porter was elected Second Vice-President of the Econometric Society. He will serve as President in 2015.

James Poterba served as the President-Elect of the Eastern Economic Association.

James Rauch was awarded a Guggenheim Fellowship

James Rebitzer (with co-authors Randall Cebul, Lowell Taylor, and Mark Votruba) won the 20th Annual Kenneth J. Arrow Award for best paper in Health Economics for "Unhealthy Insurance Markets: Search Frictions and the Cost and Quality of Health Insurance."

Hélène Rey won the first Birgit Grodal Award, the Council of the European Economic Association's prize to a European-based female economist who has made a significant contribution to the Economics profession. The award is named after Birgit Grodal, who passed away before she could take up her duties as the first female president of the EEA.

Michael Roberts was named editor of the *Journal of Finance,* along with **Kenneth Singleton** and Bruno Biais.

Dani Rodrik gave the Colin Clark Lecture at the Australasian Econometric

Society Meetings in Melbourne and the Roepke Lecture in Economic Geography at the Association of American Geographers conference in New York City. He was also elected a member of the Science Academy of Turkey.

Nancy Rose was elected Vice-President of the American Economic Association.

Raffaella Sadun won the Kauffman Junior Faculty Fellowship in Entrepreneurship Research.

Jose Scheinkman was elected a Corresponding Member of the Brazilian Academy of Sciences.

Philipp Schnabl won the Brattle Group's First Paper Prize award for "The International Transmission of Bank Liquidity Shocks: Evidence from an Emerging Market." The prize is for the best paper in the field of corporate finance in the *Journal of Finance*.

Peter Schott received an Emerald Management Review Citation of Excellence Award.

William Schwert received the *European Financial Management* Readers' Choice Award for Scholarship in Financial Research for "Stock Volatility during the Recent Financial Crisis."

Suzanne Scotchmer received an honorary doctorate from the University of Basel and was elected a Fellow of the Econometric Society.

Joel Slemrod received the National Tax Association's Daniel M. Holland Medal for outstanding contributions to the study and practice of public finance.

Robert Stambaugh and **Lubos Pastor** received the Whitebox Selected Research First Prize for "Are Stocks Really Less Volatile in the Long Run?" He and co-authors Jianfeng Yu and Yu Yuan also received an AQR Insight Award Honorable Mention for "The Short of It: Investor Sentiment and Anomalies."

Paula Stephan was named Science Careers Person of the Year by *Science Careers,* the online career publication of the journal *Science*, for her significant and sustained contribution to the welfare of early-career scientists.

Richard Steckel was elected a Fellow of the Cliometric Society, an award for career achievement in the field of economic history.

Lars Svensson has been named a Foreign Honorary Member of the AEA.

Richard Sylla was elected a Fellow of the American Academy of Arts and Sciences, and re-elected chairman of the board of trustees of the Museum of American Finance.

John Taylor received the Manhattan Institute's Hayek Prize for *First Principles: Five Keys to Restoring America's Prosperity*. The prize recognizes a book published within the past two years that best reflects F.A. Hayek's vision of economic and individual liberty.

Michele Tertilt was awarded a five-year ERC Grant for her research on Gender Differences and the Macroeconomy.

Sheridan Titman served as President of the American Finance Association.

Robert Townsend was awarded the Jean-Jacques Laffont Prize in economics and, along with **Joseph Kaboski,** received the Frisch Medal of the Econometric Society for a paper on the structural evaluation of microfinance programs. He also was elected a member of the National Academy of Sciences.

Francesco Trebbi won the Bank of Canada Governor's Award which recognizes outstanding Canadian academics at an early stage in their careers who are working on research critical to the Bank of Canada's mandate.

Stijn Van Nieuwerburgh won the JP Morgan Prize for the best paper at the Western Finance Association for "Too-Systemic-To-Fail: What Option Markets Imply about Sector-wide Government Guarantees" with **B. Kelly** and **H. Lustig.** He also won best paper prize at the Utah Winter Finance Conference for "Health and Mortality Delta: Assessing the Welfare Costs of Household Insurance Choice", co-authored by **R.Koijen** and M. Yogo. He was chosen one of the World's Best 40 Business School Professors under the Age of 40 by Poets & Quants; and he received an Excellence in Refereeing Award from the *American Economic Review*.

John Van Reenen was elected a Fellow of the Econometric Society.

Pietro Veronesi and **Lubos Pastor** were awarded the 2012 Smith Breeden Distinguished Paper Prize for "Uncertainty about Government Policy and Stock Prices."

Jonathan Vogel was awarded an Alfred P. Sloan Research Fellowship.

John Whalley won the Killam Prize, awarded annually to Canadian scholars working in the humanities, social sciences, natural sciences, health sciences, and engineering in recognition of career achievements.

Eugene White was awarded the Economic History Association's Jonathan R.T. Hughes Prize for Excellence in Teaching.

Heidi Williams was awarded an NSF CAREER Grant for her research on technological change in health care markets.

Michael Woodford won the *American Economics Journal: Macroeconomics* Best Paper Prize for "Simple Analytics of the Government Expenditure Multiplier."

Wei Xiong and **Zhiguo He** won the Smith-Breeden Prize for best capital market paper published in the *Journal of Finance*.

Stanley Zin was elected a Fellow of the Econometric Society.

Program and Working Group Meetings

Economic Fluctuations and Growth Research Meeting

The NBER's Program on Economic Fluctuations and Growth met at the Federal Reserve Bank of San Francisco on February 8, 2013. Matthias Doepke, Northwestern University, and Emmanuel Farhi, Harvard University, organized the meeting. These papers were discussed:

- **Zhen Huo,** University of Minnesota, and **Jose-Victor Rios-Rull**, University of Minnesota and NBER, "Engineering a Paradox of Thrift Recession"
- **Simeon Alder**, University of Notre Dame; **David Lagakos**, Arizona State University; and **Lee Ohanian**, University of California, Los Angeles and NBER, "The Decline of the U.S. Rust Belt: A Macroeconomic Analysis"
- **Raj Chetty** and **John Friedman**, Harvard University and NBER; **Soren Leth-Petersen**, University of Copenhagen; **Torben Nielsen**, The Danish National Center for Social Research; and **Tore Olsen**, Harvard University, "Active vs. Passive Decisions and Crowdout in Retirement Savings Accounts: Evidence from Denmark" (NBER Working Paper No. 18565)
- **Lawrence Christiano** and **Martin S. Eichenbaum**, Northwestern University and NBER, and **Mathias Trabandt**, Federal Reserve Board, "Unemployment and Business Cycles"
- **Andrew Atkeson** and **Pierre-Olivier Weill**, University of California, Los Angeles and NBER, and **Andrea Eisfeldt**, University of California, Los Angeles, "The Market for OTC Derivatives"
- **Guido Menzio**, University of Pennsylvania and NBER, and **Greg Kaplan**, Princeton University and NBER, "Shopping Externalities and Self-Fulfilling Unemployment Fluctuations"

Summaries of these papers may be found at: http://www.nber.org/confer/2013/EFGw13/summary.html

Labor Studies Program Meeting

The NBER's Program on Labor Studies, directed by David Card of the University of California, Berkeley, met at the Federal Reserve Bank of San Francisco on February 22, 2013. These papers were discussed:

- **Raven Molloy** and **Christopher Smith**, Federal Reserve Board of Governors, and **Abigail Wozniak**, University of Notre Dame and NBER, "Declining Migration within the US: The Role of the Labor Market"
- **Jesse Gregory**, University of Michigan, "The Impact of Rebuilding Grants and Wage Subsidies on the Resettlement Choices of Hurricane Katrina Victims"
- **Patrick Kline**, University of California, Berkeley and NBER, and **Melissa Tartari**, Yale University, "What Distributional Impacts Mean: Welfare Reform Experiments and Competing Margins of Adjustment"
- **Gary Chamberlain**, Harvard University and NBER, "Predictive Effects of Teachers and Schools on Test Scores, College Attendance, and Earnings"

- **Gordon Dahl**, University of California, San Diego and NBER; **Dan-Olof Rooth** and **Magnus Carlsson**, Linnaeus University; and **Bjorn Ockert**, Institute for Evaluation of Labour Market and Education Policy, "The Effect of Schooling on Cognitive Skills" (NBER Working Paper No. 18484)

- **Edward Lazear** and **Kathryn Shaw**, Stanford University and NBER, and **Christopher Stanton,** University of Utah, "The Value of Bosses" (NBER Working Paper No. 18317)

Summaries of these papers may be found at: http://www.nber.org/confer/2013/LSs13/summary.html

Industrial Organization Program Meeting

The NBER's Program on Industrial Organization, directed by Nancy Rose of MIT, met in Stanford, CA on February 22 and 23, 2013. Ryan Kellogg, NBER and University of Michigan, and Gregory Lewis, NBER and Harvard University, organized the meeting. These papers were discussed:

- **David Muir** and **Katja Seim**, University of Pennsylvania, and **Maria Ana Vitorino**, University of Minnesota, "Drip Pricing When Consumers Have Limited Foresight: Evidence from Driving School Fees"

- **Sanjog Misra**, University of California, Los Angeles, and **Harikesh Nair** and **Oystein Daljord**, Stanford University, "Salesforce Composition and Compensation"

- **Meghan Busse** and **Florian Zettelmeyer**, Northwestern University and NBER, and **Ayelet Israeli**, Northwestern University, "Repairing the Damage: The Effect of Price Expectations on Auto-Repair Price Quotes"

- **Allan Collard-Wexler**, New York University and NBER, and **Jan De Loecker**, Princeton University and NBER, "Reallocation and Technology: Evidence from the U.S. Steel Industry" (NBER Working Paper No. 18739)

- **Francesco Decarolis**, Boston University, "What Does Medicare D Share with LIBOR and Procurement Auctions? The Distortionary Effects of the Low Income Subsidy"

- **Ying Fan**, **Kai-Uwe Kuhn**, and **Francine Lafontaine**, University of Michigan, "Financial Constraints and Franchising Decisions"

- **Matthew Gentzkow** and **Jesse Shapiro**, University of Chicago and NBER, and **Michael Sinkinson**, University of Pennsylvania, "Competition and Ideological Diversity: Historical Evidence from U.S. Newspapers" (NBER Working Paper No. 18234)

Summaries of these papers may be found at: http://www.nber.org/confer/2013/IOs13/summary.html

Health Care Program Meeting

The NBER's Program on Health Care met in Cambridge on March 1, 2013. Program Director Jonathan Gruber, NBER and MIT, organized the meeting. These papers were discussed:

- **Mireille Jacobson**, RAND Corporation and NBER; **Joseph Newhouse**, Harvard University and NBER; and **Craig Earle**, Harvard University, "Can Physician Induced Demand Benefit Patients? Evidence from a Major Change to Medicare Chemotherapy Reimbursement Policy"

- **Robert Kaestner**, University of Illinois and NBER, and **Anthony Lo Sasso**, University of Illinois, Chicago, "Does Seeing the Doctor More Often Keep You Out of the Hospital?"

- **Jason Abaluck**, Yale University and NBER, and **Leila Agha**, Boston University, "Negative Tests and the Efficiency of Medical Care: Investigating the Determinants of Imaging Overuse"

- **Benjamin Handel**, University of California, Berkeley and NBER, and **Jonathan Kolstad**, University of Pennsylvania and NBER, "Health Insurance for Humans: Information Frictions, Plan Choice, and Consumer Welfare"

- **David Cutler**, Harvard University and NBER; **Jonathan Skinner**, Dartmouth College and NBER; **Ariel Stern**, Harvard University; and **David Wennberg**, Dartmouth Medical School, "Physician Beliefs and Patient Preferences: A New Look at Supplier-Induced Demand"

Summaries of these papers are available at: http://www.nber.org/confer/2013/HCs13/summary.html

DAE Program Meeting

The NBER's Program on the Development of the American Economy, directed by Claudia Goldin of Harvard University, met in Cambridge on March 2, 2013. The meeting was organized by Daniel Fetter and Eric Hilt, Wellesley College and NBER. These papers were discussed:

- **Hoyt Bleakley**, University of Chicago and NBER, and **Joseph Ferrie**, Northwestern University and NBER, "Land Openings on the Georgia Frontier and the Coase Theorem in the Short and Long Run"

- **Melissa Dell**, Harvard University and NBER, "Path Dependence in Development: Evidence from the Mexican Revolution"

- **Leticia Arroyo Abad**, University of California, Davis, and **Noel Maurer**, Harvard University and NBER, "Fiscal Receiverships and Charter Cities, 1904–31"

- **Matthew Jaremski**, Colgate University and NBER, and **Peter Rousseau**, Vanderbilt University, "The Rise of Commercial Bank Deposits in the United States"

- **Marc Weidenmier**, Claremont McKenna College and NBER; **Joseph Davis**, The Vanguard Group; and **Ryan Shaffer**, Claremont McKenna College, "America's First Great Moderation"

- **Charles Calomiris**, Columbia University and NBER, and **Jonathan Pritchett**, Tulane University, "Betting on Secession: Quantifying Political Events Surrounding Slavery and the Civil War"

Summaries of these papers are available at: http://www.nber.org/confer/2013/DAEs13/summary.html

Monetary Economics Program Meeting

The NBER's Monetary Economics Program met at the Federal Reserve Bank of Chicago on March 8, 2012. NBER Research Associates Anil Kashyap and Amir Sufi, University of Chicago Booth School, organized this program:

- **Gary Gorton** and **Andrew Metrick**, Yale University and NBER, and **Lei Xie**, Yale University, "The Flight from Maturity"
- **Samuel Hanson** and **Adi Sunderam**, Harvard University, and **David Scharfstein**, Harvard University and NBER, "An Evaluation of Money Market Fund Reform Proposals"
- **David Lucca** and **Emanuel Moench**, Federal Reserve Bank of New York, "The Pre-FOMC Announcement Drift"
- **James Costain** and **Anton Nakov**, Bank of Spain, "Logit Price Dynamics"
- **Matthias Doepke**, Northwestern University and NBER, and **Martin Schneider**, Stanford University and NBER, "On the Optimality of a Dominant Unit of Account"
- **Lars Svensson**, Sveriges Riksbank and NBER, "The Possible Unemployment Cost of Average Inflation below a Credible Target"

Summaries of these papers may be found at: http://www.nber.org/confer/2013/MEs13/summary.html

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Fiscal Policy after the Financial Crisis

Fiscal Policy after the Financial Crisis, edited by Alberto Alesina and Francesco Giavazzi, is available now from the University of Chicago Press.

The last recession refocused the attention of policymakers and academic economists on the importance of tax rates and government spending, and especially on the size and sensitivity of fiscal multipliers, which determine how fiscal policies will influence economic growth. This NBER conference volume considers the measurement of various government spending multipliers and reports estimates of their size. It also explores the consequences of debt reduction through decreased government spending and through increased taxes and it examines how the short-term political forces driving fiscal policy might be balanced with aspects of the long-term planning that governs monetary policy.

Alesina directs the NBER's Program on Political Economy and is a professor of economics at Harvard University. Giavazzi is a Research Associate in the NBER's Program on International Finance and Macroeconomics and a professor of economics at Bocconi University in Italy. This volume costs $110.00.

Political Arithmetic: Simon Kuznets and the Empirical Tradition in Economics

Political Arithmetic: Simon Kuznets and the Empirical Tradition in Economics, by Robert William Fogel, Enid M. Fogel, Mark Guglielmo, and Nathanial Grotte, is the most recent volume in the NBER's Series on Long-Term Factors in Economic Development. In this monograph, Fogel and his collaborators tell the story of economist Simon Kuznets and the founding of the National Bureau of Economic Research, along with the creation of the concept of Gross National Product (GNP), which enabled us to measure the performance of entire economies. The product of a lifetime of studying the workings of economies and skillfully employing the tools of economics, *Political Arithmetic* is simultaneously a history of a key period of economic thought and a testament to the power of applied ideas.

Fogel directed the NBER's Program on the Development of the American Economy for many years, and remains a program member today. He also directs the Center for Population Economics at the University of Chicago. This monograph costs $32.00.

Innovation Policy and the Economy, Volume 13

Innovation Policy and the Economy, Volume 13, edited by Josh Lerner and Scott Stern, is available from the University of Chicago Press. This NBER volume reports on the proceedings of an annual conference that is held in Washington which serves as an ongoing forum for the presentation of research on the interactions among public policy, the innovation process, and the economy. The papers in this volume include a consideration of the complex set of innovation-policy challenges that arise in managing publicly funded research, an examination of the increasingly visible role of philanthropic funding for science, a look at the increasingly contentious issue of public funding of growth-oriented entrepreneurship, and two papers that turn their attention to the evaluation of recent federal policy changes as the result of the America Invents Act and the America Competes Act.

Lerner and Stern are Research Associates in the NBER's Program on Productivity, Innovation, and Entrepreneurship, which Lerner also co-directs. He is the Jacob H. Schiff Professor of Investment Banking at Harvard Business School. Stern heads the NBER's Working Group on Innovation Policy and is the School of Management Distinguished Professor and Chair of the Technological Innovation, Entrepreneurship, and Strategic Management Group at the MIT Sloan School of Management.

This volume costs $30.00 in paperback and $58.00 for the clothbound version.

NBER Reporter

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