Research UPDATE

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Research and Statistics Group www.newyorkfed.org/research

Study Attributes Low Market Share of ARMs to Shifts in Term Structure of Interest Rates, Decline of Jumbo Mortgage Market

In the past several years, U.S. homebuyers have increasingly opted for fixed-rate mortgages over adjustable-rate mortgages (ARMs). The ARM share—which comprised 60 to 70 percent of all mortgage originations at one point in the mid-1990s—is now close to historic lows, with less than 10 percent of all new mortgages carrying an adjustable interest rate.

In a recent study in *Current Issues in Economics and Finance* (vol. 16, no. 8, "Why Is the Market Share of Adjustable-Rate Mortgages So Low?"), authors Emanuel Moench, James Vickery, and Diego Aragon explore the reasons for this trend. They conclude that the fall in the ARM share predominantly reflects the same long-run factors that drove mortgage choice in earlier periods—namely, the term structure of interest rates and its effects on the pricing of different kinds of mortgages. Supply-side factors, in particular the contraction of the "jumbo" mortgage market, also play a role.

The authors begin their analysis by reviewing the competing explanations for the decline in the ARM share. One view holds that this decline is closely related to the financial crisis, and particularly to such developments as the collapse of the securitized nonprime mortgage market, where ARMs predominated. A second and related view holds that the heavy publicity surrounding high default rates on subprime ARMs and the "payment shock" triggered by interest rate resets on ARMs drove down demand for the adjustable-rate mortgages. A third view attributes the decline to changes in the term structure of interest rates and their effects on the pricing of mortgages.

To test these competing theories, Moench, Vickery, and Aragon conduct a statistical analysis using loan-level mortgage data from Lender Processing Services and from the Federal Housing Finance Agency's Monthly Interest Rate Survey. They construct a model that contains a variety of variables that might help explain mortgage choice, including the term premium on Treasury yields, the spread between interest rates on fixed- and adjustable-rate mortgages, and variables that capture changes in lending standards and household liquidity constraints.

The model performs well in explaining the decline in the market share of adjustable-rate mortgages in recent years. A "rule-of-thumb" variable that measures the difference between the current

Also in this issue…

interest rate on fixed-rate mortgages and the average adjustable rate over the past three years proves to be the most important determinant of the ARM share historically, and also accounts for most of the recent decline in the popularity of adjustable-rate mortgages. Significantly, this finding suggests that households base their choice of a fixed- or adjustable-rate mortgage in part on past interest rates, not just current ones.

In addition, the authors conclude that a drop in the fraction of jumbo mortgage loans (loans that do not conform to the limits established for mortgages purchased by the housing GSEs Fannie Mae and Freddie Mac) may also have contributed to the reduced ARM share. For a variety of institutional reasons, the share of ARMs is significantly higher in the jumbo market than in the "conforming" market. As the jumbo market has contracted—owing to falling home prices and rising limits on the size of conforming loans, factors that are both related to the financial crisis—the prevalence of adjustable-rate mortgages has decreased as well. ■

Publications and Papers

The Research and Statistics Group produces a wide range of publications:

- The *Economic Policy Review*—a policy-oriented journal focusing on economic and financial market issues.
- *EPR Executive Summaries*—online versions of selected *Economic Policy Review* articles, in abridged form.
- *Current Issues in Economics and Finance*—concise studies of topical economic and financial issues.
- *Second District Highlights*—a regional supplement to *Current Issues*.
- *Staff Reports*—technical papers intended for publication in leading economic and finance journals, available only online.
- *Publications and Other Research*—an annual catalogue of our research output.

New in the *Economic Policy Review*

Volume 16, Number 2

Program Design, Incentives, and Response: Evidence from Educational Interventions

Rajashri Chakrabarti

In an effort to reform K-12 education, policymakers have introduced school vouchers—scholarships that make students eligible to transfer from public to private schools—in some U.S. school districts. Chakrabarti analyzes two such educational interventions in the United States: the Milwaukee and Florida voucher programs. Under the Milwaukee program, vouchers were imposed from the outset, so that all low-income public school students became eligible for vouchers to transfer to private schools. In contrast, schools in the Florida program were only threatened with vouchers, with students of a particular school becoming eligible for vouchers only if the school received two "F" grades in a period of four years. Unlike the Milwaukee schools, Florida schools therefore had an incentive to avoid vouchers. Using school-level data from Florida and Wisconsin, the author shows that the performance effects of the threatened public schools under the Florida program have exceeded those of corresponding schools in Milwaukee. The lessons of her study are broadly applicable to New York City's educational reform efforts.

Policy Analysis Using DSGE Models: An Introduction

Argia M. Sbordone, Andrea Tambalotti, Krishna Rao, and Kieran Walsh

Many central banks have come to rely on dynamic stochastic general equilibrium, or DSGE, models to inform their economic outlook and to help formulate their policy strategies. But while their use is familiar to policymakers and academics, these models are typically not well known outside these circles. Sbordone et al. introduce the basic structure, logic, and application of the DSGE framework to a broader public by providing an example of its use in monetary policy analysis. They present and estimate a simple New Keynesian DSGE model, highlighting the core features that this basic specification shares with more elaborate versions. The authors then apply the estimated model to study the sources of the sudden increase in inflation that occurred in the first half of 2004. One important lesson derived from this exercise is that the management of expectations can be a more effective tool for stabilizing inflation than actual movements in the policy rate. This result is consistent with the increasing focus on the pronouncements of central bankers regarding their future actions.

The Introduction of the TMPG Fails Charge for U.S. Treasury Securities

Kenneth D. Garbade, Frank M. Keane, Lorie Logan, Amanda Stokes, and Jennifer Wolgemuth

The TMPG fails charge for U.S. Treasury securities provides that a buyer of Treasury securities can claim monetary compensation from the seller if the seller fails to deliver the securities on a timely basis. The charge was introduced in May 2009 and replaced an existing market convention of simply postponing—without any explicit penalty and at an unchanged invoice price—a seller's obligation to deliver Treasury securities if the seller fails to deliver the securities on a scheduled settlement date. This study explains how a proliferation of settlement fails following the insolvency of Lehman Brothers Holdings Inc. in September 2008 led the Treasury Market Practices Group (TMPG)—a group of market professionals committed to supporting the integrity and efficiency of the U.S. Treasury market—to promote a change in the existing market convention. The change—the introduction of the fails charge—was significant because it mitigated an important dysfunctionality in the secondary market for U.S. Treasury securities and because it stands as an example of the value of cooperation between the public and private sectors in responding to altered market conditions in a flexible, timely, and innovative fashion.

Articles are available at www.newyorkfed.org/research/epr/index.html.

New Titles in the *Staff Reports* Series

The following staff reports are available at www.newyorkfed.org/research/staff_reports.

Macroeconomics and Growth

No. 476, November 2010
Fitting Observed Inflation Expectations
Marco Del Negro and Stefano Eusepi

This paper provides evidence on the extent to which inflation expectations generated by a standard Christiano et al. (2005)/Smets and Wouters (2003)–type DSGE model are in line with what is observed in the data. Del Negro and Eusepi consider three variants of this model that differ in terms of the behavior of, and the public's information on, the central banks' inflation target, allegedly a key determinant of inflation expectations. They find that: 1) time-variation in the inflation target is needed to capture the evolution of expectations during the post-Volcker period; 2) the variant in which agents have imperfect information is strongly rejected by the data; 3) inflation expectations appear to contain information that is not present in the other series used in estimation; and 4) none of the models fully captures the dynamics of this variable.

Microeconomics

No. 478, November 2010
Double Majors: One for Me, One for the Parents?
Basit Zafar

This paper investigates how students decide on the composition of their paired majors, that is, whether the majors are substitutes or complements. Zafar collects innovative data on subjective expectations from a sample of Northwestern University sophomores and incorporates it in a choice model of double majors that also captures the notion of specialization. He finds that enjoying the coursework and gaining the approval of one's parents are the most important determinants in the choice of majors. The model estimates reject the hypothesis that students major in one field to pursue their own interests and in another for their parents' approval. Instead, Zafar finds that gaining parental approval and enjoying a field of study both academically and professionally are outcomes that students feel are important for both majors. However, the author does find that students act strategically in choosing their majors, selecting two that differ in their chances of completion and difficulty and in finding a job upon graduation.

No. 479, November 2010
An Introduction to the FRBNY Consumer Credit Panel
Donghoon Lee and Wilbert van der Klaauw

In this paper, the authors introduce the FRBNY Consumer Credit Panel, a new longitudinal database with detailed information on consumer debt and credit. The panel uses a unique sample design and information derived from consumer credit reports to track individuals' and households' access to and use of credit at a quarterly frequency. In any given quarter ranging from the first quarter of 1999 to the present, the panel can be used to compute nationally representative estimates of the levels and changes in various aspects of individual and household liabilities. In addition to describing the sample design, the use of sample weights, and the credit report information included in the database, the authors provide some comparisons of population statistics and consumer debt estimates derived from the panel with those based on data from the American Community Survey and the Flow of Funds Accounts of the United States.

No. 480, December 2010
The Financial Crisis at the Kitchen Table: Trends in Household Debt and Credit
Meta Brown, Andrew Haughwout, Donghoon Lee, and Wilbert van der Klaauw

The FRBNY Consumer Credit Panel, created from a sample of U.S. consumer credit reports, is an ongoing panel of quarterly data on individual and household debt. The panel shows a substantial run-up in total consumer indebtedness between the first quarter of 1999 and the peak in the third quarter of 2008, followed by a steady decline through the third quarter of 2010. During the same period, delinquencies rose sharply: Delinquent balances peaked at the close of 2009 and then began to decline again. This paper documents these trends and discusses their sources. The authors focus particularly on the decline in debt outstanding since mid-2008, which has been the subject of considerable policy and media interest. While the magnitudes of balance declines and borrower defaults, represented as "charge-offs" on consumers' credit reports, have been similar, the authors find that debt pay-down has been more pronounced than this simple comparison might indicate.

Banking and Finance

No. 477, November 2010
The Tri-Party Repo Market before the 2010 Reforms
Adam Copeland, Antoine Martin, and Michael Walker

This paper provides a descriptive and quantitative account of the tri-party repo market before the reforms proposed in 2010 by the Task Force on Tri-Party Repo Infrastructure. Copeland, Martin, and Walker provide an extensive description of the mechanics of this market. They also use data from July 2008 to early 2010 to document quantitative features of the market. The authors find that both the level of haircuts and the amount of funding were surprisingly stable. The stability of the margins is in contrast to evidence from other repo markets. Perhaps surprisingly, the data reveal relatively few signs of market stress for dealers other than Lehman Brothers, for which the authors provide some evidence. This suggests that runs in the tri-party repo market may occur precipitously—as traditional bank runs do—rather than manifest themselves as large increases in margins.

Quantitative Methods

No. 475, October 2010
Equity Premium Predictions with Adaptive Macro Indexes
Jennie Bai

Fundamental economic conditions are crucial determinants of equity premia. However, commonly used predictors do not adequately capture the changing nature of economic conditions and hence have limited power in forecasting equity returns. To address the inadequacy, this paper constructs macro indexes from large data sets and adaptively chooses optimal indexes to predict stock returns. Bai finds that adaptive macro indexes explain a substantial fraction of the short-term variation in future stock returns and have more forecasting power than both the historical average of stock returns and commonly used predictors. The forecasting power exhibits a strong cyclical pattern, implying the ability of adaptive macro indexes to capture time-varying economic conditions. This finding highlights the importance of using dynamically measured economic conditions to investigate empirical linkages between the equity premium and macroeconomic fundamentals. ■

Most Downloaded Publications

Listed below are the most sought-after Research Group articles and papers from the New York Fed's website and from the Bank's page on the Social Science Research Network site (www.ssrn.com/link/FRB-New-York.html).

New York Fed website, fourth-quarter 2010:

- "Shadow Banking," by Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, and Hayley Boesky (*Staff Reports*, no. 458, July 2010) – 2,674 downloads
- "Understanding the Securitization of Subprime Mortgage Credit," by Adam B. Ashcraft and Til Schuermann (*Staff Reports*, no. 318, March 2008) – 1,217 downloads
- "Why Are Banks Holding So Many Excess Reserves?" by Todd Keister and James McAndrews (*Staff Reports*, no. 380, July 2009) – 959 downloads

SSRN website, fourth-quarter 2010:

- "Understanding the Securitization of Subprime Mortgage Credit," by Adam B. Ashcraft and Til Schuermann (*Staff Reports*, no. 318, March 2008) – 446 downloads
- "The Corporate Governance of Banks," by Jonathan R. Macey and Maureen O'Hara (*Economic Policy Review*, vol. 9, no. 1, April 2003) – 199 downloads
- "Determinants and Impact of Sovereign Credit Ratings," by Richard Cantor and Frank Packer (*Economic Policy Review*, vol. 2, no. 2, October 1996) – 175 downloads

For lists of the top-ten downloads, visit www.newyorkfed.org/research/top_downloaded/index.html.

Papers Presented

"Funding Liquidity Risk and the Cross-Section of Stock Returns," Tobias Adrian. European Central Bank Conference, "The Role of Financial Market Liquidity in Periods of Turbulence: Theory, Empirical Evidence, and Implications for Policy," Frankfurt, Germany, October 14. With Erkko Etula and Tyler Muir.

"Measuring Systemic Risk," Tobias Adrian, NBER seminar, Cambridge, Massachusetts, October 27. With Viral V. Acharya, Lasse H. Pedersen, Thomas Philippon, and Matthew Richardson.

"Shadow Banking," Tobias Adrian. Centre for Economic Policy Research Conference, "The Future of Regulatory Reform," London, England, October 4. With Zoltan Pozsar, Adam Ashcraft, and Hayley Boesky.

"A New Test of Borrowing Constraints for Education," Meta Brown. Canadian Research Data Centre Network Conference, "Economic Relations between Children and Parents," held at the John Deutsch Institute for the Study of Economic Policy, Queen's University, Kingston, Ontario, Canada, October 21. With John Karl Scholz and Ananth Seshadri.

"Sectoral Price Facts in a Sticky-Price Model," Carlos Carvalho. Bank of Spain seminar, Madrid, Spain, October 8. With Jae Won Lee. Also presented at a seminar cosponsored by the Center for Financial Studies, the Deutsche Bundesbank, and the European Central Bank, held at the European Central Bank, Frankfurt, Germany, October 6, and a University of Maryland Economics Department seminar, College Park, Maryland, November 10.

"Credit Market Competition and the Nature of Firms," Nicola Cetorelli. New York University Economics Department seminar, New York City, October 7.

"Intended and Unintended Consequences of Merit Aid," Rajashri Chakrabarti. Association for Public Policy Analysis and Management conference, Boston, Massachusetts, November 5. With Joydeep Roy.

"The Impact of Competition on Technology Adoption: An Apples-to-PCs Analysis," Adam Copeland. University of North Carolina Economics Department seminar, Chapel Hill, North Carolina, November 3. With Adam Shapiro. Also presented at a University of Toronto Economics Department seminar, Toronto, Ontario, Canada, November 8; a University of Minnesota Economics Department seminar, Minneapolis, Minnesota, November 10; and the Southern Economic Association annual meeting, Atlanta, Georgia, November 22.

"The Great Escape? A Quantitative Evaluation of the Fed's Nonstandard Policies," Marco Del Negro and Andrea Ferrero. With Gauti Eggertsson and Nobuhiro Kiyotaki. Presented by Ferrero at the Centre for Economic Policy Research/European Summer Institute Fourteenth Annual Conference, "How Has Our View of Central Banking Changed with the Recent Financial Crisis?" Izmir, Turkey, October 28. Presented by Del Negro at the European Central Bank Conference on Monetary and Fiscal Policy Challenges in Times of Financial Stress, Frankfurt, Germany, December 2.

"Macroeconomics-Business Cycles," Stefano Eusepi. Conference on Labor Supply Heterogeneity and Macroeconomic Comovement, North Carolina State University, Raleigh, North Carolina, October 4. With Bruce Preston.

"Banking Globalization and Monetary Transmission," Linda Goldberg. Seminar on Banking Globalization, Monetary Transmission, and the Lending Channel, cosponsored by the London Business School, the London School of Economics and Political Science, and University College London, held at the London School of Economics and Political Science, London, England, November 15. With Nicola Cetorelli.

"Micro, Macro, and Strategic Forces in Invoicing International Trade," Linda Goldberg. Seminar cosponsored by the Paris School of Economics and Sciences Po, Paris, France. November 16. With Cédric Tille.

"Financial Amplification of Foreign Exchange Risk Premia," Jan Groen. Institute for Monetary and Economic Studies seminar, held at the Bank of Japan, Tokyo, Japan, December 14. With Tobias Adrian and Erkko Etula.

"Bailouts and Financial Fragility," Todd Keister. City University of New York Graduate Center seminar, New York City, October 26. Also presented at a Wharton School Finance Department Micro seminar, University of Pennsylvania, Philadelphia, Pennsylvania, November 4, and the London School of Economics and Political Science Financial Markets Group–AXA Research Fund Conference on Financial Intermediation, Banking and Macro-Stability, London, England, December 2.

"Labor-Dependent Capital Income Taxation that Encourages Work and Saving," Sagiri Kitao. Queen's University Economics Department seminar, Kingston, Ontario, Canada, October 7. Also presented at a State University of New York at Albany Economics Department seminar, Albany, New York, October 22.

"A Life-Cycle Model of Trans-Atlantic Employment Experiences," Sagiri Kitao. Rutgers University Economics Department seminar, New Brunswick, New Jersey, November 2. With Lars Ljungqvist and Thomas Sargent.

"Evaluating Interest Rate Rules in an Estimated DSGE Model," Andrea Tambalotti. NBER workshop on Methods and Applications for Dynamic Stochastic General Equilibrium Models, held at the Federal Reserve Bank of Atlanta, Atlanta, Georgia, October 1.

"Household Debt and Saving during the 2007 Recession," Wilbert van der Klaauw. CIRET (Centre for International Research on Economic Tendency Surveys) Conference on Economic Tendency Surveys and the Services Sector, hosted by the Conference Board, New York City, October 15. With Rajashri Chakrabarti, Donghoon Lee, and Basit Zafar. Also presented at the NBER Conference on Research in Income and Wealth, held at the Federal Reserve Board, Washington, D.C., November 12.

"How Do College Students Form Expectations?" Basit Zafar. CIBC Centre for Human Capital and Productivity Workshop on Post-Secondary Education, University of Western Ontario, London, Ontario, Canada, December 9.

"Understanding Trust in a Segmented Society," Basit Zafar. Experimental Science Association North American conference, Tucson, Arizona, November 13. With Adeline Delavande. ■

Recently Published

Jaison Abel. 2010. "Hedonic Price Indexes for Personal Computer Operating Systems and Productivity Suites," with Ernst R. Berndt, Cory W. Monroe, and Alan G. White. *Annals of Economics and Statistics* 79/80, July-December: 787-807.

Tobias Adrian. 2010. "Financial Intermediaries and Monetary Economics," with Hyun Song Shin. In Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, 3: 601-50. Elsevier B.V.

Morten Bech. 2010. "The Topology of the Federal Funds Market," with Enghin Atalay. *Physica A: Statistical Mechanics and Its Applications* 389, no. 22 (November): 5223-46.

Carlos Carvalho. 2010. "Loss Aversion, Asymmetric Market Comovements, and the Home Bias," with Kevin Amonlirdviman. *Journal of International Money and Finance* 29, no. 7 (November): 1303-20.

Erica Groshen. 2010. Comment on "Are the New Jobs Good Jobs?" by Katharine G. Abraham and James R. Spletzer. In Katharine G. Abraham, James R. Spletzer, and Michael Harper, eds., *Labor in the New Economy*, 143-7. NBER conference volume. Chicago: University of Chicago Press.

Sagiri Kitao. 2010. "Labor-Dependent Capital Income Taxation." *Journal of Monetary Economics* 57, no. 8 (November): 959-74.

Sagiri Kitao. 2010. "Short-Run Fiscal Policy: Welfare, Redistribution, and Aggregate Effects in the Short and Long Run." *Journal of Economic Dynamics and Control* 34, no. 10 (October): 2109-25.

Donald Morgan. 2010. Comment on "Banks' Financial Conditions and the Transmission of Monetary Policy: A FAVAR Approach," by Ramona Jimborean and Jean-Stéphane Mésonnier. *International Journal of Central Banking* 6, no. 4 (December): 119-24.

Simon Potter. 2010. "A Flexible Approach to Parametric Inference in Nonlinear and Time-Varying Time Series Models," with Gary Koop. *Journal of Econometrics* 159, no. 1 (November): 134-50.

Ayşegül Şahin. 2010. "Labor-Market Matching with Precautionary Savings and Aggregate Fluctuations," with Per Krusell and Toshihiko Mukoyama. *Review of Economic Studies* 77, no. 4 (October): 1477-1507.

James Vickery. 2010. "Rainfall Insurance in Semi-Arid India: Contract Design, Household Participation, and Future Prospects," with Robert Townsend and Xavier Giné. In Kenneth Tang, ed., *Weather Risk Management*, 141-54. London: RiskBooks. ■

Research and Statistics Group Publications and Papers: October–December 2010

Publications are available at www.newyorkfed.org/research/publication_annuals/index.html.

ECONOMIC POLICY REVIEW, VOL. 16

No. 2, October 2010

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Forthcoming

Central Bank Dollar Swap Lines and Overseas Dollar Funding Costs
Linda S. Goldberg, Craig Kennedy, and Jason Miu

The Federal Reserve's Commercial Paper Funding Facility
Tobias Adrian, Karin Kimbrough, and Dina Marchioni

CURRENT ISSUES IN ECONOMICS AND FINANCE, VOL. 16

No. 8, December 2010

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STAFF REPORTS

No. 475, October 2010

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