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Daniel L. Greenwald

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Academic Positions

2019 -	Judy C. Lewent (1972) and Mark Shapiro Career Development Assistant Professor of Finance, MIT Sloan School of Management
2016 - 2019	Assistant Professor of Finance, MIT Sloan School of Management

Education

2016	Ph.D. in Economics, New York University Thesis committee: Sydney Ludvigson (chair), Stijn Van Nieuwerburgh, Gianluca Violante
2008	A.B. in Economics, *cum laude*, Harvard University

Research Areas

Macroeconomics, Asset Pricing, Housing and Mortgage Markets, Corporate Finance.

Working Papers

1. "The Mortgage Credit Channel of Macroeconomic Transmission"
   Revise and Resubmit, *Journal of Political Economy*

   Abstract: I investigate how the structure of the mortgage market influences macroeconomic dynamics, using a general equilibrium framework with prepayable debt and a limit on the ratio of mortgage payments to income. This realistic environment amplifies transmission from interest rates into debt, house prices, and economic activity. Monetary policy can more easily stabilize inflation due to this amplification, but contributes to larger fluctuations in credit growth. A relaxation of payment-to-income standards appears essential to the recent boom. A cap on payment-to-income ratios, not loan-to-value ratios, is the more effective macroprudential policy for limiting boom-bust cycles.

2. "Firm Debt Covenants and the Macroeconomy: The Interest Coverage Channel"

   Abstract: Interest coverage covenants, which set a maximum ratio of interest payments to earnings, are among the most popular provisions in firm debt contracts. For affected firms, the amount of additional debt that can be issued without violating these covenants is highly sensitive to interest rates. Combining a theoretical model with firm-level data, I find that interest coverage limits generate strong amplification from interest rates into firm borrowing and investment. Importantly, most firms that have interest coverage covenants also face a maximum on the ratio of the stock of debt to earnings. Simultaneously imposing these limits implies a novel source of state-dependence: when interest rates are high, interest coverage limits are tighter, amplifying the influence of interest rate changes and monetary policy. Conversely, in low-rate environments, debt-to-earnings covenants dominate and transmission is weakened.

3. "Do Credit Conditions Move House Prices?" with Adam Guren

   Abstract: To what extent did an expansion and contraction of credit drive the 2000s housing boom and bust? The existing literature lacks consensus, with findings ranging from credit having no effect to credit driving the entire house price cycle. We show that the key difference behind these disparate results is how rental markets are modeled: assuming perfect segmentation between rental and owner-occupied housing leads to large effects of credit on house prices, while assuming frictionless rental markets makes credit irrelevant for house prices. We develop a model with frictional rental markets that nests both extremes and allows us to consider intermediate cases. We argue that the relative elasticity of the price-to-rent ratio and homeownership with respect to an identified credit shock is a sufficient statistic to measure these frictions. We estimate this moment, and use it to calibrate our model. Our results imply that rental markets are highly frictional and close to segmented, consistent with large effects of credit on house prices. Experiments using the structural model imply that credit conditions explain between 29% and 46% of the rise in price-rent ratios over the boom.

4. "How the Wealth was Won: Factor Shares as Market Fundamentals" with Martin Lettau and Sydney Ludvigson

   Abstract: We provide novel evidence on the driving forces behind the sharp increase in equity values over the post-war era. From the beginning of 1989 to the end of 2017, 23 trillion dollars of real equity wealth was created by the nonfinancial corporate sector. We estimate that 54% of this increase was attributable to a reallocation of rents to shareholders in a decelerating economy. Economic growth accounts for just 24%, followed by lower interest rates (11%) and a lower risk premium (11%). From 1952 to 1988 less than half as much wealth was created, but economic growth accounted for 92% of it.

5. "The Credit Line Channel" with John Krainer and Pascal Paul

   Abstract: Aggregate bank lending to firms expands following adverse macroeconomic shocks, such as the outbreak of COVID-19 or a monetary policy tightening, at odds with canonical models. Using loan-level supervisory data, we show that these dynamics are driven by draws on credit lines by large firms. Banks that experience larger drawdowns restrict term lending more — an externality onto smaller firms. Using a structural model, we show that credit lines are necessary to reproduce the flow of credit toward less constrained firms after adverse shocks. While credit lines increase total credit growth, their redistributive effects exacerbate the fall in investment.

6. "What Explains the COVID-19 Stock Market?" with Josue Cox and Sydney Ludvigson

   Abstract: What explains stock market behavior in the early weeks of the coronavirus pandemic? Estimates from a dynamic asset pricing model point to wild fluctuations in the pricing of stock market risk, driven by shifts in risk aversion or sentiment. We find further evidence that the Federal Reserve played a role in these fluctuations, via a series of announcements outlining unprecedented steps to provide several trillion dollars in loans to support the economy. As of July 31 of 2020, however, only a tiny fraction of the credit that the central bank announced it stood ready to provide in early April had been extended, reinforcing the conclusion that market movements during COVID-19 have been more reflective of sentiment than substance.

7. "Origins of Stock Market Fluctuations" with Martin Lettau and Sydney Ludvigson

   Abstract: Three mutually uncorrelated economic disturbances that we measure empirically explain 85% of the quarterly variation in real stock market wealth since 1952. A model is employed to interpret these disturbances in terms of three latent primitive shocks. In the short run, shocks that affect the willingness to bear risk independently of macroeconomic fundamentals explain most of the variation in the market. In the long run, the market is profoundly affected by shocks that reallocate the rewards of a given level of

production between workers and shareholders. Productivity shocks play a small role in historical stock market fluctuations at all horizons.

Publications

8. "Financial Fragility with SAM?" with Tim Landvoigt and Stijn Van Nieuwerburgh. Forthcoming, *Journal of Finance*

   Abstract: Shared Appreciation Mortgages (SAMs) feature mortgage payments that adjust with house prices. These mortgage contracts are designed to stave off home owner default by providing payment relief in the wake of a large house price shock. SAMs have been hailed as an innovative solution that could prevent the next foreclosure crisis, act as a work-out tool during a crisis, and alleviate fiscal pressure during a downturn. They have inspired Fintech companies to offer home equity contracts. However, the home owner's gains are the mortgage lender's losses. A general equilibrium model with financial intermediaries who channel savings from saver households to borrower households shows that indexation of mortgage payments to aggregate house prices increases financial fragility, reduces risk sharing, and leads to expensive financial sector bailouts. In contrast, indexation to local house prices reduces financial fragility and improves risk-sharing. The two types of indexation have opposite implications for wealth inequality.

9. "Rare Shocks, Great Recessions" with Vasco Cúrdia and Marco Del Negro. *Journal of Applied Econometrics*, Vol. 29(7), pp. 1031-1052, November/December 2014.

   Winner, Richard Stone Prize in Applied Econometrics for the best paper with substantive econometric application in the 2014 and 2015 volumes of the *Journal of Applied Econometrics*.

   Abstract: We estimate a DSGE model where rare large shocks can occur, by replacing the commonly used Gaussian assumption with a Student's t distribution. Results from the Smets and Wouters (2007) model estimated on the usual set of macroeconomic time series over the 1964-2011 period indicate that 1) the Student's t specification is strongly favored by the data even when we allow for low-frequency variation in the volatility of the shocks, and 2) the estimated degrees of freedom are quite low for several shocks that drive U.S. business cycles, implying an important role for rare large shocks. This result holds even if we exclude the Great Recession period from the sample. We also show that inference about low-frequency changes in volatility – and in particular, inference about the magnitude of Great Moderation – is different once we allow for fat tails.

Fellowships and Awards

2016	AREUEA Homer Hoyt Doctoral Dissertation Award (1st Prize)
2015-16	Dean's Dissertation Fellowship, New York University
2015	Macro Financial Modeling Fellowship, Becker Friedman Institute
2010-15	McCracken Fellowship, New York University
2014	TACC-BP Parallel Programming Contest (1st Place)

Courses Taught

Spring 2017-18	Undergraduate, Managerial Finance (MIT Course 15.401)
Fall 2016-20	Ph.D., Advanced Financial Economics I (MIT Course 15.472, Formerly 15.442)

Seminar Presentations

2020	OFCE, London School of Economics, London Business School, Bank of England, Imperial, UAI, VMACS Junior Series, Virtual Finance Workshop
2019	Chicago Booth (Finance), Duke, Northwestern, Maryland, Baruch Real Estate, Wisconsin Business School.
2018	Kellogg, Duke Fuqua, Stanford GSB, Sveriges Riksbank, Federal Reserve Board, CFPB.
2017	Federal Reserve Bank of Dallas, European Central Bank, Boston College, Princeton.
2016	Bank of Canada, Brown, MIT Sloan, Harvard Business School, UC San Diego, UC Berkeley Haas, Baruch, Federal Reserve Bank of New York, UT Austin McCombs, Penn State, Congressional Budget Office, University of Minnesota, UPenn Wharton, Federal Reserve Board of Governors, Northwestern, MIT (Macro), University of Connecticut, Boston University, Federal Reserve Bank of Cleveland.
2015	Federal Reserve Bank of New York, NYU Stern, Federal Reserve Bank of Philadelphia.

Conference Presentations

2020	VMACS Junior Conference, Journal of Finance Conference: Financial Consequences of the COVID-19 Pandemic, NBER EFG
2019	AEA Meetings (Atlanta), Macro Financial Modeling Winter Meeting, SED Annual Meeting (St. Louis), NBER Summer Institute (Corporate Finance, Monetary Economics, Capital Markets and the Economy), Philadelphia Fed Conference on Credit and the Macroeconomy.
2018	AEA Meetings (Philadelphia), BI-SHoF Conference, SED Annual Meeting (Mexico City), ESSFM (Gerzensee), Workshop on Housing, Credit and Heterogeneity (Stockholm).
2017	Macro Financial Modeling Winter Meeting, Philadelpha Workshop on Macroeconomics and Economic Policy, Boston Fed GBUREES, SED Annual Meeting (Edinburgh), CEF (New York), CEPR European Summer Symposium in Financial Markets, Norges Bank Workshop on Housing and Household Finance, Bank of Canada Annual Conference, FRB Atlanta/Georgia State University Real Estate Finance Conference, UC Davis GSM Symposium on Inequality.
2016	Macroeconomics and Business CYCLE Conference, Midwest Macro, IAAE (Milan), SED Annual Meeting (Toulouse), CEPR European Summer Symposium in Financial Markets, MIT GCFP Annual Conference, Macro Finance Society (Chicago).
2015	Federal Reserve Bank of Chicago Rookie Conference.
2014	SED Annual Meeting (Toronto).

Conference Discussions

1. "Mortgage Pricing and Monetary Policy" by Matteo Benetton, Alessandro Gavazza, and Paolo Surico *FRBSF Advances in Financial Research Conference*, Oct 2019
2. "Competition and Incentives in the Mortgage Market: The Role of Brokers" by Claudia Robles-Garcia *NBER Household Finance*, Jul 2019
3. "Human Capitalists" by Andrea Eisfeldt, Antonio Falato, and Mindy Xiaolan *Texas Finance Festival*, Jan 2019

4. "Is Housing the Business Cycle? A Multi-resolution Analysis for OECD Countries" by Yuting Huang, Qiang Li, Kim Hiang Liow, and Xiaoxia Zhou *AREUEA Annual Meetings*, Jan 2019
5. "Mortgage Prepayment and Path-Dependent Effects of Monetary Policy" by David Berger, Konstantin Milbradt, Fabrice Tourre, and Joseph Vavra *NBER Monetary Economics Meeting*, Nov 2018
6. "State Dependency of Monetary Policy: the Refinancing Channel" by Martin Eichenbaum, Sergio Rebelo, and Arlene Wong *NBER Economic Fluctuations and Growth Meeting*, Oct 2018
7. "Too Much Skin-in-the-Game? The Effect of Mortgage Market Concentration on Credit and House Prices" by Deeksha Gupta *Tepper-LAEF Conference*, Sep 2018
8. "Bank Risk-Taking and the Real Economy: Evidence from the Housing Boom and its Aftermath" by Antonio Falato, Giovanni Favara, and David Scharfstein. *SFS Cavalcade*, May 2018.
9. "Anatomy of Corporate Borrowing Constraints" by Chen Lian and Yueran Ma. *NBER Monetary Economics Meeting*, March 2018.
10. "Color and Credit: Race, Regulation, and the Quality of Financial Services" by Taylor Begley and Amiyatosh Purnanandam. *UNC Junior Faculty Roundtable*, December 2017.
11. "An Equilibrium Model of Housing and Mortgage Markets with State-Contingent Lending Contracts" by Tomasz Piskorski and Alexei Tchistyi. *10th Macro Finance Society Workshop*, Boston, November 2017.
12. "Regulating Household Leverage" by Anthony DeFusco, Stephanie Johnson, and John Mondragon. *Housing: Micro Data, Macro Problems*, Bank of England, June 2017.
13. "Regional Heterogeneity and Monetary Policy" by M. Beraja, A. Fuster, E. Hurst and J. Vavra. *Econometric Society Winter Meetings*, Chicago, January 2017.
14. "Household Debt and Monetary Policy: Revealing the Cash Flow Channel" by M. Flodén, M. Kilström, J. Sigurdsson, and R. Vestman. *Econometric Society Winter Meetings*, Chicago, January 2017.
15. "The Equity Premium and the One Percent" by A.A. Toda and K. Walsh. *AFA Meetings*, Chicago, January 2017.

Professional Activities

Referee: American Economic Journal: Macroeconomics, American Economic Journal: Microeconomics, American Economic Review, Econometrica, International Economic Review, International Journal of Central Banking, Journal of Applied Econometrics, Journal of Economic Dynamics and Control, Journal of the European Economic Association, Journal of Empirical Finance, Journal of Finance, Journal of Money and Central Banking, Journal of Monetary Economics, Journal of Political Economy, Macroeconomic Dynamics, Quarterly Journal of Economics, Review of Economic Dynamics, Review of Economics and Statistics, Review of Economic Studies, Review of Financial Studies.

Conference Program Committee: Society for Computational Economics Annual Conference (2017), WFA Annual Meeting (2017-20), EFA Annual Meeting (2018-20), SFS Cavalcade (2019-20), Midwest Finance Association (2020).

Personal Information

Born: August 3, 1986. Citizenship: USA.

Languages: English (native), French (intermediate), Russian (intermediate), Spanish (beginner).