

ECO 507: Empirical Macro-Finance

Spring 2019

MW 9-10:30

Atif Mian

Princeton University

Course outline

This is a six week second year PhD course in Empirical Macro-Finance. Course grading will be based on empirical assignments given out in class. The twelve lecture outline is given below.

1 Intro to macro-finance

Why macro-finance, i.e. why should finance matter for the macroeconomy? We start with the theoretical argument that finance is largely a side-show for the macroeconomy, particularly for understanding business cycles. We test and soundly reject this hypothesis.

So how should we model the macroeconomy to incorporate finance? We discuss the basic insights at a high level. Distribution matters, sometimes across firms and banks, and sometimes across creditor and debtor households. Heterogeneity matters, households differ in their MPC, firms differ in their productivity and liquidity constraints. All this makes policy relevant, macro-prudential policy, monetary policy, tax policy, fiscal policy and lender of last resort policy.

The rest of the course is dedicated to understanding these linkages, while remaining loyal to Sir Doyle's dictum, "It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts."

1. Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2013. "When Credit Bites Back". *Journal of Money, Credit and Banking* 45 (s2): 3–28. ISSN: 1538-4616
2. Moritz Schularick and Alan M. Taylor. 2012. "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008". *American Economic Review* 102 (2): 1029–1061
3. Simon Gilchrist and Egon Zakrajšek. 2012. "Credit Spreads and Business Cycle Fluctuations". *American Economic Review* 102 (4): 1692–1720
4. David López-Salido, Jeremy C Stein, and Egon Zakrajšek. 2017. "Credit-market sentiment and the business cycle". *The Quarterly Journal of Economics*: qjx014
5. Matthew Baron and Wei Xiong. 2017. "Credit expansion and neglected crash risk". *The Quarterly Journal of Economics* 132 (2): 713–764
6. Robin Greenwood and Samuel G. Hanson. 2013. "Issuer Quality and Corporate Bond Returns". *Review of Financial Studies* 26 (6): 1483–1525
7. Tyler Muir. 2017. "Financial Crises and Risk Premia". *The Quarterly Journal of Economics* 132, no. 2 (): 765–809
8. Tyler Muir and Arvind Krishnamurthy. 2017. "How Credit Cycles across a Financial Crisis". *NBER working paper*, no. 23850
9. Ricardo J. Caballero. 2010. "Macroeconomics after the Crisis: Time to Deal with the Pretense-of-Knowledge Syndrome". *Journal of Economic Perspectives*
10. Paul Romer. 2016. "The Trouble With Macroeconomics". *The American Economist*

2 Financial accelerator, aggregate supply and aggregate demand

Theoretically there are two broad channels through which the financial sector may impact the business cycle, one operating through the supply-side and the other through demand-side of the real economy. We discuss the theory and empirics of analyzing these two channels.

1. Bengt Holmstrom and Jean Tirole. 1997. “Financial intermediation, loanable funds, and the real sector”. *the Quarterly Journal of economics* 112 (3): 663–691
2. Ben Bernanke and Mark Gertler. 1989. “Agency Costs, Net Worth, and Business Fluctuations”. *American Economic Review* 79 (1): 14–31
3. Atif R Mian, Amir Sufi, and Emil Verner. 2017. “Credit Supply and Business Cycle Amplification: Evidence from Banking Deregulation in the 1980s”
4. Berrak Bahadir and Inci Gumus. 2016. “Credit decomposition and business cycles in emerging market economies”. *Journal of International Economics* 103:250–262

3 Household debt and aggregate demand: rational expectations and common beliefs

Why might household debt amplify business cycle downturns? We discuss theories based on rational expectations and common beliefs where a combination of household heterogeneity, and macro frictions such as zero lower bound constraint or downward nominal wage rigidity generate “over-borrowing” that leads to recessions. The work highlights why individuals may fail to internalize aggregate demand externality, or a pecuniary externality, leading to a case for macro-prudential interventions.

1. Anton Korinek and Alp Simsek. 2016. “Liquidity trap and excessive leverage”. *The American Economic Review* 106 (3): 699–738
2. Stephanie Schmitt-Grohé and Martín Uribe. 2016. “Downward Nominal Wage Rigidity, Currency Pegs, and Involuntary Unemployment”. *Journal of Political Economy*
3. Gauti B. Eggertsson and Paul Krugman. 2012. “Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach”. *Quarterly Journal of Economics* 127 (3): 1469–1513
4. Guido Lorenzoni. 2008. “Inefficient Credit Booms”. *The Review of Economic Studies* 75 (3): 809–833. doi:10.1111/j.1467-937X.2008.00494.x
5. Veronica Guerrieri and Guido Lorenzoni. 2017. “Credit crises, precautionary savings, and the liquidity trap”. *The Quarterly Journal of Economics* 132 (3): 1427–1467
6. Emmanuel Farhi and Iván Werning. 2015. “A Theory of Macroprudential Policies in the Presence of Nominal Rigidities”. Working Paper

4 The credit-driven household demand channel and Fisher’s debt deflation hypothesis

We outline and test the credit-driven household demand channel and Fisher’s debt-deflation hypothesis.

1. Atif R Mian, Amir Sufi, and Emil Verner. 2016. “Household debt and business cycles worldwide”. *National Bureau of Economic Research*
2. Mathias Drehmann, Mikael Juselius, and Anton Korinek. 2017. *Accounting for debt service: the painful legacy of credit booms*. BIS Working Papers No 645

3. Emil Verner and Gyozo Gyongyosi. 2017. “Household Debt Revaluation and the Real Economy: Evidence from a Foreign Currency Debt Crisis”
4. Atif Mian and Amir Sufi. 2018. “Finance and Business Cycles: The Credit-Driven Household Demand Channel”. *Journal of Economic Perspectives* 32 (3): 31–58. doi:10.1257/jep.32.3.31. <http://www.aeaweb.org/articles?id=10.1257/jep.32.3.31>

5 Household debt and aggregate demand: heterogeneous beliefs and behavioral biases

Models with aggregate demand and / or pecuniary externalities can potentially explain credit-induced boom-bust cycles in the real economy. However, there is a lot of evidence that financial variables (credit growth, spreads, financial sector balance sheet health) predict forecasting errors as well. We discuss why heterogeneous beliefs and behavioral biases are important for properly understanding macro-finance evidence, and study empirical evidence in favor of these forces.

1. Pedro Bordalo, Nicola Gennaioli, and Andrei Shleifer. 2016. *Diagnostic expectations and credit cycles*. Tech. rep. National Bureau of Economic Research
2. John Geanakoplos. 2010. “The Leverage Cycle”. *NBER Macroeconomics Annual 2009, Volume 24*: 1–65
3. Craig Burnside, Martin Eichenbaum, and Sergio Rebelo. 2017. “Understanding Booms and Busts in Housing Markets”. *Journal of Political Economy* 124 (4): 1088–1147
4. Atif Mian and Amir Sufi. 2019. “Credit Supply and Housing Speculation”. *NBER working paper*
5. Atif Mian and Amir Sufi. 2009. “The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis”. *The Quarterly Journal of Economics* 124 (4): pp. 1449–1496
6. Charles Kindleberger. 1978. *Manias, Panics and Crashes: A history of financial crises*. New York, Basic Books
7. Hyman Minsky. 1986. *Stabilizing an Unstable Economy*. New Haven, Yale University Press

6 Heterogeneous agent models, credit and aggregate demand

The micro-foundation of models that connect credit with aggregate demand relies on heterogeneity in marginal propensity to consume and borrow across households. We discuss where such heterogeneity might come from and study some related empirical work.

1. Christopher D Carroll and Miles S Kimball. 1996. “On the concavity of the consumption function”. *Econometrica* 64 (4): 981–992
2. Christopher Harris and David Laibson. 2003. “Hyberbolic Discounting and Consumption”. *Econometric Society Monographs* 35:258–297
3. Atif Mian and Amir Sufi. 2014a. “House price gains and US household spending from 2002 to 2006”. *National Bureau of Economic Research*
4. Atif Mian and Amir Sufi. 2011. “House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis”. *American Economic Review* 101 (5): 2132–56
5. Scott R Baker. 2018. “Debt and the Response to Household Income Shocks: Validation and Application of Linked Financial Account Data”. *Journal of Political Economy*
6. Atif Mian, Kamalesh Rao, and Amir Sufi. 2013. “Household Balance Sheets, Consumption, and the Economic Slump”. *The Quarterly Journal of Economics* 128 (4): 1687–1726

7. Atif Mian and Amir Sufi. 2014b. “What Explains the 2007–2009 Drop in Employment?” *Econometrica* 82 (6): 2197–2223

7 Risk-sharing and business cycles

A key implication of prominent macro-finance models is that risk-sharing matters for aggregate behavior, with better risk-sharing limiting how much the economy suffers in a downturn and easing recovery. We discuss implications for security design, regulation and macro-prudential policies and some related empirical work.

1. Atif Mian and Amir Sufi. 2015. *House of debt: How they (and you) caused the Great Recession, and how we can prevent it from happening again*. University of Chicago Press [chapter 12]
2. Peter Ganong and Pascal Noel. 2017. *The Effect of Debt on Default and Consumption: Evidence from Housing Policy in the Great Recession*. Working Paper
3. Sumit Agarwal et al. 2017. “Policy Intervention in Debt Renegotiation: Evidence from the Home Affordable Modification Program”. *Journal of Political Economy* 125 (3)
4. Thomas Piskorski and Amit Seru. 2019. “Debt Relief and Slow Recovery: A Decade after Lehman”. *NBER working paper*
5. Marco Di Maggio et al. 2017. “Interest Rate Pass-Through: Mortgage Rates, Household Consumption, and Voluntary Deleveraging”. *American Economic Review* 107 (11): 3550–88

8 Monetary Policy, Liquidity and the Business Cycle

How important is liquidity and central bank’s role as lender for last resort for the macroeconomy? We also discuss how the effectiveness of monetary policy depends on household balance sheet, and why.

1. Gary Richardson and William Troost. 2009. “Monetary intervention mitigated banking panics during the great depression: quasi-experimental evidence from a federal reserve district border, 1929–1933”. *Journal of Political Economy* 117 (6): 1031–1073
2. Nicolas L Ziebarth. 2013. “Identifying the effects of bank failures from a natural experiment in Mississippi during the Great Depression”. *American Economic Journal: Macroeconomics* 5 (1): 81–101
3. Sumit Agarwal et al. 2018. “Do Banks Pass Through Credit Expansions to Consumers Who Want to Borrow? Evidence from Credit Cards”. *Quarterly Journal of Economics* 133 (1): 129–90
4. Aditya Aladangady. 2014. “Homeowner balance sheets and monetary policy”. *FEDS Working Paper*
5. James Cloyne, Clodomiro Ferreira, and Paolo Surico. 2016. “Monetary policy when households have debt: new evidence on the transmission mechanism”
6. Martin Eichenbaum, Sergio Rebelo, and Arlene Wong. 2018. “State Dependent Effects of Monetary Policy: the Refinancing Channel”. *NBER working paper*
7. Adrien Auclert. 2019. “Monetary Policy and the Redistribution Channel”. *American Economic Review*

9 Estimating The Bank Lending Channel

Do financial shocks to the banking sector matter for the real economy? We investigate this classic “bank lending channel” question empirically. How does one separate credit supply shocks from

credit demand shocks? How can we “aggregate up” the transmission of bank-level shock to the macro level?

1. Asim Ijaz Khwaja and Atif Mian. 2008. “Tracing the impact of bank liquidity shocks: Evidence from an emerging market”. *The American Economic Review* 98 (4): 1413–1442
2. Gabriel Jiminez et al. 2014. “The real effects of the bank lending channel”
3. Anil K Kashyap and Jeremy C Stein. 2000. “What do a million observations on banks say about the transmission of monetary policy?” *American Economic Review*: 407–428
4. Gabriel Chodorow-Reich. 2014. “The employment effects of credit market disruptions: Firm-level evidence from the 2008–9 financial crisis”. *The Quarterly Journal of Economics* 129 (1): 1–59
5. Gabriel Chodorow-Reich and Antonio Falato. 2017. “The Loan Covenant Channel: How Bank Health Transmits to the Real Economy”. *NBER working paper*
6. Michael Greenstone, Alexandre Mas, and Hoai-Luu Nguyen. 2014. “Do credit market shocks affect the real economy? Quasi-experimental evidence from the Great Recession and ‘normal’ economic times”. *National Bureau of Economic Research*
7. Rhys M Bidder, John R. Krainer, and Adam H. Shapiro. 2017. “Drilling into Bank Balance Sheets: Examining Portfolio Responses to an Oil Shock”. *Federal Reserve Bank of San Francisco Working Paper 2017-03*
8. Julia Fonseca and Bernardus Van Doornik. 2018. “Financial Development, Labor Markets, and Aggregate Productivity: Evidence from Brazil”. *Working paper*

10 Credit supply, moral hazard and agency conflicts

The credit intermediation process may suffer from moral hazard and agency conflicts - e.g. borrowers may lie on their application and lenders may try to pass-on risk to others / “greater fools”. We discuss such issues and why they may become particularly relevant during waves of “financial innovation”.

1. Joshua Coval, Jakub Jurek, and Erik Stafford. 2009. “The economics of structured finance”. *The Journal of Economic Perspectives* 23 (1): 3–25
2. Uday Rajan, Amit Seru, and Vikrant Vig. 2015. “The failure of models that predict failure: Distance, incentives, and defaults”. *Journal of Financial Economics* 115 (2): 237–260
3. Benjamin J Keys et al. 2010. “Did securitization lead to lax screening? Evidence from subprime loans”. *The Quarterly journal of economics* 125 (1): 307–362
4. Atif Mian and Amir Sufi. 2016. “Fraudulent income overstatement on mortgage applications during the credit expansion of 2002 to 2005”. *Review of Financial Studies*: hhw104
5. Yuliya Demyanyk and Otto Van Hemert. 2011. “Understanding the subprime mortgage crisis”. *Review of financial Studies* 24 (6): 1848–1880
6. Tomasz Piskorski, Amit Seru, and James Witkin. 2015. “Asset quality misrepresentation by financial intermediaries: evidence from the RMBS market”. *The Journal of Finance* 70 (6): 2635–2678

11 Low interest rates and the production side

The last week takes the focus away from business cycle macro-finance and towards longer term macro-finance questions. This lecture discusses the idea of secular stagnation, credit super cycles

and low long-term interest rates. Our main focus will be on whether these forces feedback to the production-side through their impact on market competition and productivity growth.

1. Ernest Liu, Atif Mian, and Amir Sufi. 2019. “Low Interest Rates, Market Power and Productivity Growth”. *NBER working paper*

12 Where does credit come from?

What lies behind the long-term secular rise in credit across the world since 1980? We discuss the possible connection between rising inequality, surplus savings glut and credit creation.

1. Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2013. “When Credit Bites Back”. *Journal of Money, Credit and Banking* 45 (s2): 3–28. ISSN: 1538-4616
2. Moritz Schularick and Alan M. Taylor. 2012. “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008”. *American Economic Review* 102 (2): 1029–1061
3. Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2014. “The Great Mortgaging: Housing Finance, Crises, and Business Cycles”. *National Bureau of Economic Research*
4. Michael Kumhof, Romain Ranciere, and Pablo Winant. 2015. “Inequality, Leverage, and Crises”. *American Economic Review* 105 (3): 1217–1245

13 Additional topics (time permitting)

Debt overhang and labor supply

1. Will Dobbie and Jae Song. 2015. “Debt relief and debtor outcomes: Measuring the effects of consumer bankruptcy protection”. *The American Economic Review* 105 (3): 1272–1311
2. Kerwin Kofi Charles, Erik Hurst, and Matthew J Notowidigdo. 2015. “Housing booms and busts, labor market opportunities, and college attendance”. *National Bureau of Economic Research*

Student debt

1. David O Lucca, Taylor Nadauld, and Karen Chen. 2016. “Credit supply and the rise in college tuition: evidence from the expansion in federal student aid programs”

Fire sales externality

1. Atif Mian, Amir Sufi, and Francesco Trebbi. 2015. “Foreclosures, house prices, and the real economy”. *The Journal of Finance* 70 (6): 2587–2634

The effectiveness of macro-prudential policies