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QUANTITATIVE MODELS OF FINANCIAL CRISES AND MACROPRUDENTIAL POLICY

This course studies macroeconomic models of financial crises and macroprudential policy from the perspective of a quantitative dynamic stochastic general equilibrium framework. From a methodological standpoint, the course reviews applications of global, nonlinear solution methods to solve models in which asset-market incompleteness and financial frictions are “essential,” in the sense that they affect macroeconomic dynamics as well as long-run distributions of wealth and asset holdings. The course blends elements of real business cycle theory, international macroeconomics and asset pricing theory and it relies on recursive macroeconomic theory. A good understanding of the material covered in a standard first-year Ph.D. macro course provides useful background, and knowledge of computational methods used in macro modeling and familiarity with international macroeconomics are also helpful.

The course begins with a review of canonical perfect foresight models of a small open economy, followed by a simple stochastic representative-agent framework in which a small open economy faces non-insurable income shocks. This is followed by a short exploration of global methods for solving open-economy incomplete-markets models using the simple model as an example. The course explores then how the canonical small-open-economy framework can be modified and enriched by adding financial frictions to study financial crises and sudden reversals of capital inflows. The course then moves to examine the normative implications of this class of models, in particular the design and quantitative evaluation of macroprudential policy. This policy analysis includes an extension to an environment in which learning about the stability of a new financial regime leads to deviations from the standard rational expectations paradigm.

Suggested Reference material:

- AM** Arellano, Cristina and Mendoza, Enrique G., “Credit Frictions and ‘Sudden Stops’ in Small Open Economies: An Equilibrium Business Cycle Framework for Emerging Markets Crises,” in *Dynamic Macroeconomic Analysis: Theory and Policy in General Equilibrium*, ed. by S. Altug, J. Chadha and J. Nolan, Cambridge University Press, 2003.
- CV** Carlos A. Végh *Open Economy Macroeconomics in Developing Countries*, MIT Press, 2013
- OR** Obstfeld, M. & K. Rogoff, *Foundations of Intl. Macroeconomics*, MIT Press 1996.
- RR** Reinhart, Carmen M. & Kenneth Rogoff, *This Time is Different: Eight Centuries of Financial Folly*, Princeton Univ. Press.
- SL** Ljungqvist, Lars & Sargent, Thomas J., *Recursive Macroeconomic Theory*, MIT Press, 2012.

I.- Workhorse Models

Main readings:

Blanchard, O. and Fischer S. *Lectures on Macroeconomics*, section 2.4 and Ch.2 appendix C

SL chs. 8, 16 and 17 (indexed from the second edition, chapter nos. may have changed)

Durdu, C.B., Mendoza, E. and Terrones, M., “Precautionary Demand for Foreign Assets in Sudden Stop Economies: An Assessment of the New Mercantilism,” JDE 2009, available at

http://www.sas.upenn.edu/~egme/pp/Precautionary_durdu_terrones.pdf

Reference texts: **OR** 1.1, 1.2, 1.3, 2.1, 2.2, and ch. 5; **CV** Chs. 1, 3, 4

Additional references:

- Aguiar M. and G. Gopinath, 2007, "Emerging Market Business Cycles: The Cycle Is the Trend," *Journal of Political Economy* 115(1): 69-102.
- Boz, E., C. Daude, and C. B. Durdu, 2011, "Emerging Market Business Cycles Revisited: Learning about the Trend," *Journal of Monetary Economics*, vol. 58(6), pages 616-631
- Mendoza, E. "Real Business Cycles in a Small Open Economy," *American Economic Review*, 1991, <http://www.sas.upenn.edu/~egme/pp/mendoza1991.pdf>
- Mendoza, E., G. "The Robustness of Macroeconomic Indicators of Capital Mobility," in *Capital Mobility*, L. Leiderman and A. Razin eds., Cambridge Univ. Press., 1994. Available at: <http://www.sas.upenn.edu/~egme/pp/sapir.pdf>
- Mendoza, E. G, "The Terms of Trade, the Real Exchange Rate and Economic Fluctuations," *International Economic Review*, 1995. Available at: <http://www.sas.upenn.edu/~egme/pp/IER95.pdf>
- Neumeyer, P.A. and F. Perri, "Business Cycles in Emerging Economies: The Role of Interest Rates," *JME*, 2005.
- Schmitt-Grohe, S., and M. Uribe (2003), "Closing small open economies," *J. of Int. Econ*, 61, 163-185.

II.- Financial Crises and Macroprudential Regulation

Main readings:

- Bianchi, J. , E. Boz and E. Mendoza, 2012, "Macroprudential Policy in a Fisherian Model of Financial Innovation," *IMF Economic Review*, <http://www.sas.upenn.edu/~egme/pp/imfer20129a.pdf>
- Bianchi, J. and E. Mendoza, 2013, "Optimal, Time-Consistent Macroprudential Policy," NBER Working Paper no. w19704 (<http://www.sas.upenn.edu/~egme/wp/w19704.pdf>).
- Bianchi, J. and E. Mendoza, 2015, "Phases of Global Liquidity, Fundamentals News, and the Design of Macroprudential Policy." (<http://www.bis.org/publ/work505.pdf>)
- Boz. E. and E. Mendoza, 2014, "Financial Innovation, the Discovery of Risk, and the U.S. Credit Crisis," *Journal of Monetary Economics*, (<http://www.sas.upenn.edu/~egme/pp/BozMendozaJME.pdf>).
- Mendoza, E. and K. Smith, 2006 "Quantitative Implications of a Debt-Deflation Theory of Sudden Stops and Asset Prices," *JIE*,. <http://www.sas.upenn.edu/~egme/pp/JIE06Smith.pdf>
- Mendoza, E. and K. Smith 2014, "Financial Globalization, Financial Crises, & the External Portfolio Structure of Emerging Markets," *Scandinavian Journal of Economics*, <http://www.sas.upenn.edu/~egme/wp/w19072.pdf>
- Mendoza, E., "Sudden Stops, Financial Crises and Leverage," *American Economic Review*, Dec. 2010, <http://www.sas.upenn.edu/~egme/pp/CompletePaperRevforDistribution.pdf>; working paper version NBER WP, 2008 at <http://www.nber.org/papers/w14444>
- Mendoza, E. and M. Terrones, "An Anatomy of Credit Booms and their Demise," NBER Working Paper no. 18379, 2012 Available at <http://www.sas.upenn.edu/~egme/wp/w18379.pdf>
- Korinek, A. and Enrique G. Mendoza (2014), "From Sudden Stops to Fisherian Deflation: Quantitative Theory and Policy Implications. *Annual Review of Economics*, <http://www.sas.upenn.edu/~egme/wp/w19362.pdf>

Reference texts: **RR**, CV Ch. 2, 16, 17, **AM** (also as NBER WP # w8880, 2002, available at <http://www.sas.upenn.edu/~egme/pp/w8880.pdf>).

Additional references:

- Adrian, T. and H. S. Shin, 2013, "Procyclical Leverage and Value-at-Risk," mimeo, Princeton, forthcoming, *Review of Financial Studies*.
- Benigno, G., H. Chen, C. Otrok, A. Rebucci & E. Young, 2013, "Capital Controls or Real Exchange Rate Policy? A Pecuniary Externality Perspective," Research Dept. Publications IDB-WP-393, Inter-American Dev. Bank.

Bernanke, B., M. Gertler, and S. Gilchrist (1999):, "The financial accelerator in a quantitative business cycle model," in *Handbook of Macroeconomics*, ed. by J. Taylor, and M. Woodford.

Bianchi, J. "Overborrowing and Systemic Externalities in the Business Cycle" *American Economic Review*, 2011.

Calvo, G. and Mendoza, E. "Capital Markets Crises and Economic Collapse in Emerging Markets: An Informational Frictions Approach," *American Economic Review*, May 2000.

Calvo, G., Izquierdo, A. and L. Mejia, "On the Empirics of Sudden Stops: The Relevance of Balance-Sheet Effects," mimeo, Inter-American Development Bank, 2004.

Choi, W. G. and D. Cook, "Liability Dollarization and the Bank Balance Sheet Channel," *JIE*, 2003.

Cook, D. and M. Devereux, "Accounting for the East Asian Crisis: A Quantitative Model of Capital Outflows in Small Open Economies," *JIE* 2006.

Durdu, C.B. and Mendoza E., "Are Asset Price Guarantees Useful for Preventing Sudden Stops?: A Quantitative Investigation of the Globalization Hazard Moral Hazard Tradeoff," *JIE*, 2006. Available at <http://www.sas.upenn.edu/~egme/pp/JIE06Durdu.pdf>

Galati, G. and R. Moesnner, 2011, "Macroprudential policy – a literature review," BIS Working Papers No 337.

Gertler, M., S. Gilchrist, and F. Natalucci (2007), "External constraints on monetary policy and the financial accelerator," *Journal of Money Credit and Banking*.

Gertler, M. and N. Kiyotaki, 2010, "Financial Intermediation and Credit Policy in Business Cycle Analysis," in *Handbook of Mon. Economics*, B. Friedman and M. Woodford eds., Elsevier, v. 3, no. 3.

Gertler, M. and N. Kiyotaki, 2013, "Banking, Liquidity and Bank Runs in an Infinite Horizon Economy," mimeo, NYU

Gertler, M. and P. Karadi, 2012, "A Framework for Analyzing Large Scale Asset Purchases as a Monetary Policy Tool," mimeo, NYU

Iacoviello, M. 2005. "House Prices, Borrowing Constraints, and Monetary Policy in the Business Cycle," *AER*, vol. 95(3), pages 739-764, June.

Jermann, Urban & Vincenzo Quadrini, 2012. "Macroeconomic Effects of Financial Shocks," *AER*, v. 102, no. 1, 238-271, February.

Lorenzoni, G. (2008), "Inefficient Credit Booms," *Review of Economic Studies*, 75, 809-833.

Mendoza, E. "Lessons from the Debt-Deflation Theory of Sudden Stops," *AER*, Pap. & Proc., May, 2006

Mendoza, E. "Real Exchange Rate Volatility and the Price of Nontradables in Sudden-Stop Prone Economies," *Economia*, vol. 6, no. 1, Fall 2005.

Mendoza, E. "The Benefits of Dollarization when Stabilization Policy Lacks Credibility and Financial Markets are Imperfect," *Journal of Money, Credit, and Banking*, 2001.

Mendoza, E. "Credit, Prices, and Crashes: Business Cycles with a Sudden Stop," in *Preventing Currency Crises in Emerging Markets*, ed. by S. Edwards and J. Frankel, Univ. of Chicago Press, 2002, also NBER WP no. w8338, 2001.

Schimtt-Grohe, S. and M. Uribe, "Currency Pegs, Downward Nominal Wage Rigidity, Unemployment, and Macro Prudential Policy", http://www.columbia.edu/~mu2166/dnwr_pegs_iu/paper.pdf

Stein, Jeremy, "Monetary Policy as Financial-Stability Regulation," *Quarterly Journal of Economics* 127, no. 1: 57-95.

Uribe, M. "Individual Versus Aggregate Collateral Constraints and the Overborrowing Syndrome," 2006.