
Syllabus and References

This course is dedicated to the analysis of infinite horizon stochastic economies with finitely many long-lived agents. Time and uncertainty are discrete. Trade occurs sequentially, markets are competitive and information is symmetric.

This course is divided into two parts. We first study the standard model with full commitment and then analyze models with limited commitment and self-enforcing debt. In the second part, we analyze two default punishments: autarky (exclusion from saving and borrowing) and exclusion from borrowing only.

The material presented is closely related to the following references: (Kehoe and Levine 1993), (Alvarez and Jermann 2000), (Bulow and Rogoff 1989b), (Hellwig and Lorenzoni 2009), (Kocherlakota 2008) and (Chien and Lustig 2010).

1. Full-commitment environment

- (a) Static Arrow–Debreu equilibrium
- (b) Sequential trading of one period contingent bonds with non-binding debt limits
 - i. Ponzi schemes
 - ii. Natural debt limits
 - iii. Euler equations and transversality conditions

2. Limited commitment

- (a) **Autarky:**
 - i. Constrained efficiency
 - ii. Arrow–Debreu markets with participation constraints
 - iii. Sequential trading of one period contingent bonds with self-enforcing debt limits
- (b) **Exclusion from borrowing only:**
 - i. Sovereign debt literature with complete markets
 - ii. Sovereign debt literature with incomplete markets

References

- ÁBRAHÁM, A., AND E. CÁRCELES-POVEDA (2006): “Endogenous Incomplete Markets, Enforcement Constraints, and Intermediation,” *Theoretical Economics*, 1(4), 439–459.
- ABRAHAM, A., AND E. CARCELES-POVEDA (2010): “Endogenous Trading Constraints with Incomplete Asset Markets,” *Journal of Economic Theory*, 145(3), 974–1004.
- AGUIAR, M., AND M. AMADOR (2014): “Sovereign Debt,” in *Handbook of International Economics Vol 4*, pp. 647–687. North-Holland.
- AGUIAR, M., AND G. GOPINATH (2006): “Defaultable Debt, Interest Rates and the Current Account,” *Journal of International Economics*, 69(1), 64–83.

- ALVAREZ, F., AND U. J. JERMANN (2000): “Efficiency, Equilibrium, and Asset Pricing with Risk of Default,” *Econometrica*, 68(4), 775–797.
- (2001): “Quantitative Asset Pricing Implications of Endogenous Solvency Constraints,” *Review of Financial Studies*, 14(4), 1117–1151.
- AMADOR, M. (2012): “Sovereign Debt and the Tragedy of the Commons,” Mimeo, Stanford University.
- ARAUJO, A., F. KUBLER, AND S. SCHOMMER (2012): “Regulating Collateral-Requirements When Markets Are Incomplete,” *Journal of Economic Theory*, 147(2), 450–476.
- ARAUJO, A., M. R. PÀSCOA, AND J. P. TORRES-MARTÍNEZ (2002): “Collateral Avoids Ponzi Schemes in Incomplete Markets,” *Econometrica*, 70(4), 1613–1638.
- ARAUJO, A., AND A. SANDRONI (1999): “On the Convergence to Homogeneous Expectations when Markets are Complete,” *Econometrica*, 67(3), 663–672.
- ARELLANO, C. (2008): “Default Risk and Income Fluctuations in Emerging Economies,” *American Economic Review*, 98(3), 690–712.
- ARELLANO, C., AND N. KOCHERLAKOTA (2014): “Internal debt crises and sovereign defaults,” *Journal of Monetary Economics*, 68, Supplement, S68 – S80.
- ARELLANO, C., AND A. RAMANARAYANAN (2012): “Default and the Maturity Structure in Sovereign Bonds,” *Journal of Political Economy*, 120(2), 187–232.
- ARTETA, C., AND G. HALE (2008): “Sovereign Debt Crises and Credit to the Private Sector,” *Journal of International Economics*, 74(1), 53–69.
- AZARIADIS, C., AND L. KAAS (2007): “Asset Price Fluctuations Without Aggregate Shocks,” *Journal of Economic Theory*, 136(1), 126–143.
- BAI, Y., AND J. ZHANG (2010): “Solving the Feldstein–Horioka Puzzle with Financial Frictions,” *Econometrica*, 78(2), 603–632.
- BAI, Y., AND J. ZHANG (2012): “Financial Integration and International Risk Sharing,” *Journal of International Economics*, 86(1), 17–32.
- BIDIAN, F., AND C. BEJAN (2014): “Martingale Properties of Self-Enforcing Debt,” *Economic Theory*, DOI:10.1007/s00199-014-0832-0.
- BLOISE, G., AND P. REICHLIN (2011): “Asset Prices, Debt Constraints and Inefficiency,” *Journal of Economic Theory*, 146(4), 1520–1546.
- BLOISE, G., P. REICHLIN, AND M. TIRELLI (2013): “Fragility of Competitive Equilibrium with Risk of Default,” *Review of Economic Dynamics*, 16(2), 271–295.
- BOCOLA, L. (2016): “The Pass-Through of Sovereign Risk,” Forthcoming at the Journal of Political Economy.
- BRAIDO, L. H. (2007): “Trading Constraints Penalizing Default: A Recursive Approach,” *Journal of Mathematical Economics*, 44, 157–166.
- BRUTTI, F. (2011): “Sovereign Defaults and Liquidity Crises,” *Journal of International Economics*, 84(1), 65–72.

- BULOW, J., AND K. ROGOFF (1989a): “A Constant Recontracting Model of Sovereign Debt,” *Journal of Political Economy*, 97(1), 155–178.
- (1989b): “Sovereign Debt: Is to Forgive to Forget?,” *American Economic Review*, 79(1), 43–50.
- CHATTERJEE, S., D. CORBAE, M. NAKAJIMA, AND V. J. RIOS-RULL (2007): “A Quantitative Theory of Unsecured Consumer Credit with Risk of Default,” *Econometrica*, 75(6), 1525–1589.
- CHATTERJEE, S., AND B. EYIGUNGOR (2012): “Maturity, Indebtedness, and Default Risk,” *American Economic Review*, 102(6), 2674–2699.
- CHIEN, Y., H. H. COLE, AND H. LUSTIG (2011): “A Multiplier Approach to Understanding the Macro Implications of Household Finance,” *Review of Economic Studies*, 78(1), 199–234.
- CHIEN, Y., AND H. LUSTIG (2010): “The Market Price of Aggregate Risk and the Wealth Distribution,” *Review of Financial Studies*, 23(4), 1596–1650.
- COHEN, D. (1992): “The Debt Crisis: A Postmortem,” *NBER Macroeconomics Annual*, 7, 65–105.
- COHEN, D., AND J. SACHS (1986): “Growth and External Debt under Risk of Debt Repudiation,” *European Economic Review*, 30(3), 529–560.
- COLE, H., AND P. KEHOE (1995): “The Role of Institutions in Reputation Models of Sovereign Debt,” *Journal of Monetary Economics*, 35(1), 45–64.
- (1998): “Models of Sovereign Debt: Partial Versus General Reputations,” *International Economic Review*, 39(1), 55–70.
- COLE, H., AND T. J. KEHOE (2000): “Self-Fulfilling Debt Crises,” *Review of Economic Studies*, 67(1), 91–116.
- DÍAZ-GIMÉNEZ, J., G. GIOVANETTI, R. MARIMON, AND P. TELES (2008): “Nominal Debt as a Burden on Monetary Policy,” *Review of Economic Dynamics*, 11, 493–514.
- DUBEY, P., J. GEANAKOPOLOS, AND M. SHUBIK (2005): “Default and Punishment in General Equilibrium,” *Econometrica*, 73(1), 1–37.
- DUBEY, P., AND M. SHUBIK (1979): “Bankruptcy and Optimality in a Closed Trading Mass Economy Modelled as a Noncooperative Game,” *Journal of Mathematical Economics*, 6(2), 115–134.
- EATON, J., AND R. FERNANDEZ (1995): “Sovereign Debt,” in *Handbook of International Economics*, ed. by G. M. Grossman, and K. Rogoff, vol. 3, chap. 3, pp. 2031–2077. Elsevier.
- EATON, J., AND M. GERSOVITZ (1981): “Debt with Potential Repudiation: Theoretical and Empirical Analysis,” *Review of Economic Studies*, 48(2), 289–309.
- FERREIRA, T. R. T., AND J. P. TORRES-MARTÍNEZ (2010): “The Impossibility of Effective Enforcement Mechanisms in Collateralized Credit Markets,” *Journal of Mathematical Economics*, 46(3), 332–342.

- FOSTEL, A., AND J. GEANAKOPOLOS (2008): “Leverage Cycles and the Anxious Economy,” *American Economic Review*, 98(4), 1211–1244.
- (2015): “Leverage and Default in Binomial Economies: A Complete Characterization,” *Econometrica*, 83(6), 2191–2229.
- FUENTES, M., AND D. SARAVIA (2010): “Sovereign Defaulters: Do International Capital Markets Punish Them?,” *Journal of Development Economics*, 91(2), 336–347.
- GEANAKOPOLOS, J. (1997): “Promises, Promises,” in *The Economy as an Evolving Complex System II*, pp. 285–320. Addison-Wesley.
- GENNAIOLI, N., A. MARTIN, AND S. ROSSI (2014): “Sovereign Default, Domestic Banks, and Financial Institutions,” *The Journal of Finance*, 69(2), 819–866.
- GORNEMANN, N. M. (2014): “Sovereign Default, Private Investment, and Economic Growth,” Working Paper.
- GOTTARDI, P., AND F. KUBLER (2015): “Dynamic Competitive Economies with Complete Markets and Collateral Constraints,” *The Review of Economic Studies*, 82(3), 1119–1153.
- GUIMARAES, B. (2011): “Sovereign Default: Which Shocks Matter?,” *Review of Economic Dynamics*, 14(4), 553–576.
- HELLWIG, C., AND G. LORENZONI (2009): “Bubbles and Self-Enforcing Debt,” *Econometrica*, 77(4), 1137–1164.
- KEHOE, P., AND F. PERRI (2002): “International Business Cycles with Endogenous Incomplete Markets,” *Econometrica*, 70(3), 907–928.
- (2004): “Competitive Equilibria with Limited Enforcement,” *Journal of Economic Theory*, 119(1), 184–206.
- KEHOE, T. J., AND D. K. LEVINE (1993): “Debt-Constrained Asset Markets,” *Review of Economic Studies*, 60(4), 865–888.
- (2001): “Liquidity Constrained Markets Versus Debt Constrained Markets,” *Econometrica*, 69(3), 575–598.
- KIYOTAKI, N., AND J. MOORE (1997): “Credit Cycles,” *Journal of Political Economy*, 105(2), 211–248.
- KLETZER, K., AND B. WRIGHT (2000): “Sovereign Debt as Intertemporal Barter,” *American Economic Review*, 90(3), 621–639.
- KOCHERLAKOTA, N. (1996): “Implications of Efficient Risk-Sharing Without Commitment,” *Review of Economic Studies*, 63(4), 595–609.
- (2008): “Injecting Rational Bubbles,” *Journal of Economic Theory*, 142(1), 218–232.
- KÖPPL, T. V. (2006): “Risk Sharing Through Financial Markets with Endogenous Enforcement of Trades,” *Journal of Economic Dynamics and Control*, 30(11), 1987–2014.
- KRUEGER, D., AND F. PERRI (2006): “Does Income Inequality Lead to Consumption Inequality? Evidence and Theory,” *Review of Economic Studies*, 73(1), 163–193.

- KRUEGER, D., AND H. UHLIG (2006): “Competitive Risk-Sharing Contracts with One-Sided Commitment,” *Journal of Monetary Economics*, 53(7), 1661–1691.
- KUBLER, F., AND K. SCHMEDDERS (2003): “Stationary Equilibria in Asset-Pricing Models with Incomplete Markets and Collateral,” *Econometrica*, 71(6), 1767–1793.
- LIVSHITS, I., J. MACGEE, AND M. TERTILT (2007): “Consumer Bankruptcy: A Fresh Start,” *American Economic Review*, 97(1), 402–418.
- MARTIN, F. (2009): “A Positive Theory of Government Debt,” *Review of Economic Dynamics*, 12, 608–631.
- MARTINS-DA-ROCHA, V. F., AND Y. VAILAKIS (2012a): “Endogenous Debt Constraints in Collateralized Economies with Default Penalties,” *Journal of Mathematical Economics*, 48(1), 1–13.
- (2012b): “Harsh Default Penalties Lead to Ponzi Schemes: A Counterexample,” *Games and Economic Behavior*, 75(1), 277–282.
- (2015): “Constrained Efficiency Without Commitment,” *Journal of Mathematical Economics*, 61, 276–286.
- (2016a): “Borrowing in Excess of Natural Ability to Repay,” Discussion Paper.
- (2016b): “On The Sovereign Debt Paradox,” *Economic Theory*, pp. 1–22.
- MENDOZA, E. G., AND V. Z. YUE (2012): “A General Equilibrium Model of Sovereign Default and Business Cycles,” *The Quarterly Journal of Economics*, 127(2), 889–946.
- PARK, Y. (2014): “Optimal Taxation in a Limited Commitment Economy,” *The Review of Economic Studies*, 81(2), 884–918.
- PÀSCOA, M. R., AND A. SEGHIR (2009): “Harsh Default Penalties Lead to Ponzi Schemes,” *Games and Economic Behavior*, 65(1), 270–286.
- PEI, Y. (2014): “Optimal Sovereign Defaults in the Presence of Financial Frictions,” Working Paper.
- PEREZ, D. J. (2015): “Sovereign Debt, Domestic Banks and the Provision of Public Liquidity,” Working Paper.
- ROSE, A. K. (2005): “One Reason Countries Pay Their Debts: Renegotiation and International Trade,” *Journal of Development Economics*, 77(1), 189–206.
- ROSENTHAL, R. W. (1991): “On the Incentives Associated with Sovereign Debt,” *Journal of International Economics*, 30(1–2), 167–176.
- SANDLERIS, G. (2008): “Sovereign Defaults: Information, Investment and Credit,” *Journal of International Economics*, 76(2), 267–275.
- SHUBIK, M., AND C. WILSON (1977): “The Optimal Bankruptcy Rule in a Trading Economy using Fiat Money,” *Zeitschrift für Nationalökonomie*, 37, 337–354.
- SIMSEK, A. (2013): “Belief Disagreements and Collateral Constraints,” *Econometrica*, 81(1), 1–53.
- SOSA-PADILLA, C. (2015): “Sovereign Defaults and Banking Crises,” Working Paper.

- STÄHLER, N. (2013): “Recent Developments in Quantitative Models of Sovereign Default,” *Journal of Economic Surveys*, 27(4), 605–633.
- STURZENEGGER, F., AND J. ZETTELMEYER (2008): “Haircuts: Estimating Investor Losses in Sovereign Debt Restructurings, 1998–2005,” *Journal of International Money and Finance*, 27(5), 780–805.
- TOMZ, M., AND M. L. J. WRIGHT (2007): “Do Countries Default in “Bad Times”?,” *Journal of the European Economic Association*, 5(2–3), 352–360.
- (2013): “Empirical Research on Sovereign Debt and Default,” *Annual Review of Economics*, 5, 247–272.
- WRIGHT, M. L. (2006): “Private Capital Flows, Capital Controls, and Default Risk,” *Journal of International Economics*, 69(1), 120–149.
- WRIGHT, M. L. J. (2011): “The Theory of Sovereign Debt and Default,” Forthcoming, *Encyclopedia of Financial Globalization*, edited by G. Caprio, published by Elsevier.
- YEYATI, E. L., AND U. PANIZZA (2011): “The elusive costs of sovereign defaults,” *Journal of Development Economics*, 94(1), 95–105.
- YUE, V. Z. (2010): “Sovereign Default and Debt Renegotiation,” *Journal of International Economics*, 80(2), 176–187.
- ZAME, W. R. (1993): “Efficiency and the Role of Default When Security Markets are Incomplete,” *American Economic Review*, 83(5), 1142–1164.
- ZHANG, H. H. (1997a): “Endogenous Borrowing Constraints with Incomplete Markets,” *Journal of Finance*, 52(5), 2187–2209.
- (1997b): “Endogenous Short-Sale Constraint, Stock Prices and Output Cycles,” *Macroeconomic Dynamics*, 1(1), 228–254.