

UNIVERSITY OF CALIFORNIA — DAVIS

*Department of Economics*

THE ECONOMIC THEORY OF FINANCIAL MARKETS

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Office hours: Fri, 10h00 – 12h00 or by appointment

Lectures: Tue-Thu, 10h30 – 11h50, Olson 109

SYLLABUS

*Description:* This course brings the students to the frontier topics of the theory of markets, with emphasis on the theory of incomplete markets on finance, the role of information on the functioning of markets, the determinants and consequences of financial innovation, the interaction between competitive markets and bi-lateral contracts, and the empirical content of equilibrium theories. It is intended for second-year economics graduate students, all of whom have met the first-year requisites for the program.

*List of topics and readings:*

1. *Financial general equilibrium theory:* Financial assets and asset span; state prices and their indeterminacy; the fundamental theory of asset pricing; weak failure of the first fundamental theorem of welfare economics; strong failure of the first fundamental theorem (relative prices and constrained suboptimality); real and numéraire assets (non-existence of equilibrium).

M. Magill & M. Quinzii, *The Theory of Incomplete Markets*, Vol 1, MIT Press, 1996.

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M. Magill & W. Shafer, Incomplete markets, in W. Hildenbrand & H. Sonnenschein (Eds.), *Handbook of Mathematical Economics*, Vol 4, 1523-614, Elsevier, 1991.

J. Geanakoplos & H.M. Polemarchakis, Existence, regularity and constrained suboptimality of competitive allocations when assets structure is incomplete, in: W.P. Heller, R.M. Starr, D. Starret (Eds.), *Essays in Honor of K.J. Arrow*, Vol 3, 65-95, 1986.

D. Duffie & W. Shafer, Equilibrium in incomplete markets I: basic model of generic existence, *JMathE* 14 (1985), 285-300.

O. Hart, On the optimality of equilibrium when the market structure is incomplete, *JET* 11 (1975), 418-43.

J. Geanakoplos, M. Magill, M. Quinzii & J. Dreze, Generic inefficiency of stock market equilibrium when markets are incomplete, *JMathE* 19 (1990), 113-51.

A. Citanna, A. Kajii & A. Villanacci, Constrained suboptimality in incomplete markets: a general approach and two applications, *ET* 11 (1998), 495-521.

- A. Citanna, H.M. Polemarchakis & M. Tirelli, The taxation of trades in assets, *JET* 126 (2006), 299-313.
- A. Carvajal & H.M. Polemarchakis, Idiosyncratic risk and financial policy, *JET* 146 (2011), 1569-97.
2. *Financial bankruptcy and collateral.*
- J. Geanakoplos, P. Dubey & M. Shubik, Default and punishment in general equilibrium, *ECMA* 73 (2005), 1-37.
- S. Modica, A. Rustichini, J.M. Tallon, Unawareness and bankruptcy: a general equilibrium model, *ET* 12 (1998), 259-92.
- A. Araujo, F. Kübler & S. Schommer, Regulating collateral requirements when markets are incomplete, *JET* 147 (2012), 450-476.
- J. Geanakoplos, The leverage cycle, in D. Acemoglu, K. Rogoff & M. Woodford (Eds.), *NBER Macroeconomic Annual 2009*, Vol 24, 1-65, University of Chicago Press, 2010.
- A. Fostel & J. Geanakoplos, Why does bad news increase volatility and decrease leverage?, *JET* 147 (2012), 501-25.
- A. Fostel & J. Geanakoplos, Leverage and default in binomial economies: a complete characterization, *ECMA* 83 (2015), 2191-229.
- K. Teeple, Small and large worlds in general equilibrium, *unpublished mimeo*, 2019.
3. *Information and markets I: The informational content of prices.*
- R. Radner, Rational expectations equilibrium: generic existence and the information revealed by prices, *ECMA* 47 (1979), 655-78.
- P. Milgrom & N. Stokey, Information, trade and common knowledge, *JET* 26 (1982): 17-27.
- H.M. Polemarchakis & P. Siconolfi, Asset markets and the information revealed by prices, *ET* 3 (1993), 645-61.
- R. Rahi, Partially revealing rational expectations equilibria with nominal assets, *JMathE* 24 (1995), 137-46.
- J. Dutta & S. Morris, The revelation of information and self-fulfilling beliefs, *JET* 73 (1997), 231-44.
- T. Krebs, Information and asset prices in complete markets exchange economies, *Economics Letters* 65 (1999), 75-83.
- A. Citanna & A. Villanacci, Incomplete markets, allocative efficiency, and the information revealed by prices, *JET* 90 (2000), 222-53.
- L. Blume, T. Coury & D. Easley, Information, trade and incomplete markets, *ET* 29 (2006), 379-94.
- M.A. Muendler, The possibility of informationally efficient markets, *JET* 133 (2007), 467-83.
- P. Bond & H. Eraslan, Information-based trade, *JET* 145 (2010), 1675-703.

- S. Condie & J. Ganguli, Ambiguity and rational expectations equilibria, *ReStud* 78 (2011), 821-45.
- A. Carvajal & H. Zhou, Level- $k$  reasoning and rational expectations equilibrium, *unpublished mimeo*, 2019.
4. *Information and markets II: Informational asymmetries and incentives.*
- E. Prescott & R. Townsend, Pareto optima and competitive equilibria with adverse selection and moral hazard. *ECMA* 52 (1984): 21-45.
- E. Prescott & R. Townsend, General competitive analysis in an economy with private information. *IER* 25 (1984), 1-20.
- P. Hammond, Markets as constraints: multilateral incentive compatibility in continuum economies, *REStud* 54 (1987), 399-412.
- F. Allen, Repeated principal-agent relationships with lending and borrowing, *Econ Letters* 17 (1985), 27-31.
- A. Bisin & P. Gottardi, Competitive equilibria with asymmetric information, *JET* 87 (1999), 1-48.
- J. Geanakoplos & P. Dubey, Competitive pooling: Rothschild-Stiglitz reconsidered, *QJE* 117 (2002), 1529-70.
- A. Bisin & P. Gottardi, Efficient competitive equilibria with adverse selection, *JPE* 114 (2006), 485-516.
- A. Bisin, J. Geanakoplos, P. Gottardi, E. Minelli & H.M. Polemarchakis, Markets and contracts, *JMathE* 47 (2011), 279-88.
- A. Rustichini & P. Siconolfi, General equilibrium in economies with adverse selection, *ET* 37 (2008), 1-29.
- E. Fahri, M. Golosov & A. Tsyvinski, A theory of liquidity and regulation of financial intermediation, *REStud* 76 (2009), 973-92.
- J. Correia-da-Silva, General equilibrium in markets for lemons, *JMathE* 48 (2012), 187-95.
- D. Acemoglu & A. Simsek, Moral hazard and efficiency in general equilibrium with anonymous trading, *unpublished mimeo*, August 2012.
- A. Carvajal, M. Rostek & G. Sublet, Information design and capital formation, *JET* 176 (2018), 255-92.
- A. Carvajal & J. Thereze-Ferreira, Insurance contracts and financial markets, *unpublished mimeo*, September 2018.
- A. Carvajal, M. Rostek, B. Schipper & G. Sublet, Disclosure of unknown unknowns and capital formation, *unpublished mimeo*, 2019.
- S. Auster and N. Pavoni, Limited awareness and financial intermediation, *unpublished mimeo*, 2019.
5. *Market innovation I: Causes.*

- F. Allen & D. Gale, Arbitrage, short sales and financial innovation, *ECMA* 59 (1991), 1041-68.
- F. Allen & D. Gale, *Financial Innovation and Risk Sharing*, MIT Press, 1994.
- Z. Chen, Financial innovation and arbitrage pricing in frictional economies, *JET* 65 (1995), 117-35.
- D. Duffie & R. Rahi, Financial market innovation and security design, *JET* 65 (1995), 1-42.
- W. Pesendorfer, Financial innovation in a general equilibrium model, *JET* 65 (1995), 79-116.
- A. Bisin, General equilibrium with endogenously incomplete financial markets, *JET* 82 (1998), 19-45.
- P. DeMarzo & D. Duffie, A liquidity based model of security design, *ECMA* 67 (1999), 65-99.
- J. Geanakoplos, Liquidity, default and crashes: endogenous contracts in General Equilibrium, *Advances in Economics and Econometrics: Theory and Applications, Eighth World Conference*, Volume II, 170-205, Econometric Society Monographs, 2003.
- L. Braido, General equilibrium with endogenous securities and moral hazard, *ET* 26 (2005), 85-101.
- A. Carvajal, M. Rostek & M. Weretka, Competition in financial innovation, *ECMA* 80 (2012), 1895-936.
- D. Gale & P. Gottardi, Equilibrium theory of banks' capital structure, *unpublished mimeo*, February 2017.
6. *Market innovation II: Implications.*
- R. Elul, Welfare effects of financial innovation in incomplete markets economies with several consumption goods, *JET* 65 (1995), 43-78.
- C. Hara, Pareto improvement and agenda control of sequential financial innovations, *JMathE* 47 (2011), 336-45.
- F. Kübler & K. Schmedders, Financial innovations and asset price volatility, *AER: P&P* 2012, 147-51.
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7. *Revealed preferences and market equilibrium.*
- H. Sonnenschein, Do Walras' identity and continuity characterize the class of community excess demand functions? *JET* 6 (1973), 345-354.
- R. Mantel, On the characterization of aggregate excess demand. *JET* 7 (1974), 348-53.
- G. Debreu, (1974). Excess demand functions. *JMathE* 1(1), 15-21.
- K.C. Border, Revealed preference, stochastic dominance, and the expected utility hypothesis. *JET* 56 (1992), 20-42.

- D. Brown, & R.L. Matzkin, Testable restrictions on the equilibrium manifold. *ECMA* 64 (1996), 1249-62.
- D. Brown, & F. Kübler, *Computational Aspects of General Equilibrium Theory: Refutable Theories of Value*. Springer, 2008.
- C. Chambers & F. Echenique, Revealed Preference Theory. *Econometric Society Monographs*, Cambridge, 2016.
- A. Carvajal, I. Ray, & S.K. Snyder, Equilibrium behavior in markets and games: testable restrictions and identification. *JMathE* 40 (2004), 1-40.
- S.K. Snyder, Testable restrictions of Pareto optimal public good provision. *JPubE* 71 (1999), 97-119.
- A. Carvajal, The testable implications of competitive equilibrium in economies with externalities. *ET* 45 (2010), 349-78.
- R. Bachmann, Testable implications of Pareto efficiency and individual rationality. *ET* 29 (2006), 489-504.
- R. Deb, A testable model of consumption with externalities. *JET* 144 (2009), 1804-16.
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- L. Cherchye, T. Demuynck & B. DeRock, Testable implications of general equilibrium models: an integer programming approach. *JMathE* 47 (2011), 564-75.
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- F. Echenique & K. Saito, Savage in the market. *ECMA* 83 (2015), 1467-95.
- A. Carvajal & X. Song, Testing Pareto efficiency and competitive equilibrium in economies with public goods, *JMathE* 75 (2018), 19-30.
8. *Identification of fundamentals from market data I: Certainty.*
- A. Mas-Colell, The recoverability of consumers' preferences from market demand behavior. *ECMA* 45 (1977), 1409-30.
- P.A. Chiappori, I. Eklund, F. Kübler & H.M. Polemarchakis, Testable implications of general equilibrium theory: a differentiable approach. *JMathE* 40 (2004), 105-19.
- R.L. Matzkin, Identification of consumers' preferences when their choices are unobservable. In C.D. Aliprantis, R.L. Matzkin, D.L. McFadden, J.C. Moore & N.C. Yannelis (eds) *Rationality and Equilibrium*, 26 (2006), 195-215.
- Y. Balasko, The equilibrium manifold keeps the memory of individual demand functions. *ET* 24 (2004), 493-501.
- A. Carvajal, & A.J. Riasco, Identification of preferences from market data. *Advances in Theoretical Economics* 5 (2005), 1.

9. *Identification of fundamentals from market data II: Uncertainty.*

- J. Green, L. Lau & H.M. Polemarchakis, Identifiability of the von Neumann-Morgenstern utility function from asset demands, In J.R. Green, & J. Scheinkman, *General equilibrium, growth and trade: Essays in honor of Lionel McKenzie*, 1979.
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- J. Dutta & H.M. Polemarchakis, Asset Pricing and Observability, in W.A. Barnett (Ed.), *Equilibrium Theory and Applications: Proceedings of the Sixth International Symposium in Economic Theory and Econometrics*, 9-30, Springer, 1989.
- J.D. Geanakoplos & H.M. Polemarchakis, Observability and optimality. *JMathE* 19 (1990), 153-65.
- F. Kübler, P.A. Chiappori, I. Ekeland & H.M. Polemarchakis, The identification of preferences from equilibrium prices under uncertainty. *JET* 102 (2002), 403-40.
- A. Carvajal & A.J. Riasco, Identification of individual demands from market data under uncertainty. *The BE Journal of Theoretical Economics* 8 (2008), 1.
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- F. Kübler and H. Polemarchakis, The identification of beliefs from asset demand, *ECMA* 85 (2017), 1219-38.
- H. Polemarchakis, L. Selden & X. Song, The identification of ambiguity, *unpublished mimeo*, 2018.

10. *Foundations of competitive equilibrium I: The Core*

- G. Debreu & H.E. Scarf, A limit theorem on the core of an economy. *IER* 4 (1963), 235-24 .
- G. Debreu, On a theorem of Scarf. *REStud* 30 (1963), 177-80.
- R.J. Aumann, Markets with a continuum of traders. *ECMA* 32 (1964), 39-50.
- R.M. Anderson, An elementary core equivalence theorem. *ECMA* 46 (1978), 1483-7.

11. *Foundations of competitive equilibrium II: Strategic market games*

- L. Shapley & M. Shubik, Trade using one commodity as a means of payment. *JPE* 85 (1977), 937-68.
- M. Weretka, Endogenous market power. *JET* 146 (2011), 2281-306.
- A. Carvajal & M. Weretka, No-arbitrage, state prices and trade in thin financial markets. *ET* 50 (2012), 223-68.
- A. Carvajal, Arbitrage pricing in non-competitive financial markets, *ET* 66 (2018), 951-78.