

Liquidity and Asset Pricing

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Course Description:

The course will concentrate on liquidity as (i) an asset's property of being traded *quickly* and *at low cost*, and (ii) availability of funds to financial institutions. Particular attention will be devoted to exogenous transaction costs, asymmetric information, and search frictions as determinants of an asset's trading liquidity and, consequently, price. The other prominent topic is capital availability, or funding liquidity. Other topics of interest include liquidity risk and institutional responses to liquidity problems. The course will concentrate on theoretical models, but the empirical literature will be referred to throughout.

The class will combine lectures with detailed paper discussions. Each student will be assigned one paper for which to lead the discussion. It is important that all students participate in the research discussion, which requires doing the assigned readings.

When leading the discussion, a student is expected to be able to comment on the following aspects of the paper. For a theoretical paper: (i) the important assumptions in the model, the main results, and the robustness of the results to deviations in the assumptions, (ii) the technique used to derive the results, (iii) the economic intuition behind the results, and (iv) possible steps for future research (including, but not limited to, improvements in the methodology or scope of the paper). For an empirical paper: (i) the main hypotheses and their theoretical foundations, (ii) the methods for testing the hypotheses and their appropriateness, (iii) the main findings, and (iv) possible steps for future research.

More specifically, the following topics will be studied.¹ The list of papers² is still tentative and not exhaustive. Students' preferences will be taken into account in setting the final reading list.

- Exogenous transaction costs:

- * Amihud, Y., and H. Mendelson, 1986, Asset Pricing and the Bid-Ask Spread, *Journal of Financial Economics* 17, 223–49
- Amihud, Y., and H. Mendelson, 1991, Liquidity, Maturity, and the Yields on U.S. Treasury Securities, *Journal of Finance* 46, 1411–25
- * Constantinides, G., 1986, Capital Market Equilibrium with Transaction Costs, *Journal of Political Economy* 94, 842–62
- * Davis, M. and A. Norman, 1990, Portfolio Selection with Transaction Costs, *Mathematics of Operations Research* 15, 676–713
- Grossman, S. and G. Laroque, 1990, Asset Pricing and Optimal Portfolio Choice in the Presence of Illiquid Consumption Goods, *Econometrica* 58, 25–51.
- * Vayanos, D., 1998, Transaction Costs and Asset Prices: A Dynamic Equilibrium Model, *Review of Financial Studies* 11, 1–58

¹The symbol “o” flags topics that will not be studied in much detail, if at all.

²The symbol “*” indicates papers that will be discussed in detail, and are likely to be assigned readings.

- Vayanos, D., and J.-L. Vila, 1999, Equilibrium Interest Rate and Liquidity Premium with Transaction Costs, *Economic Theory* 13, 509–39
 - Huang, M., 2003, Liquidity Shocks and Equilibrium Liquidity Premia, *Journal of Economic Theory* 109, 104–29
 - Lo, A., H. Mamaysky, and J. Wang, 2004, Asset Prices and Trading under Fixed Transaction Costs, *Journal of Political Economy* 112, 1054–90
 - Liu, H., 2004, Optimal Consumption and Investment with Transaction Costs and Multiple Risky Assets, *Journal of Finance* 59, 289–338
 - Lynch, A. and S. Tan, 2011, Explaining the Magnitude of Liquidity Premia: The Roles of Return Predictability, Wealth Shocks, and State-dependent Transaction Costs, *Journal of Finance*
 - Gârleanu, N. and L. Pedersen, 2010, Dynamic Trading with Predictable Returns and Transaction Costs, working paper
 - Buss, A., R. Uppal, and G. Vilkov, 2011, Asset Prices in General Equilibrium with Transactions Costs and Recursive Utility, working paper
- Adverse selection in competitive and strategic environments:
 - * Akerlof, G., 1970, The Market for ‘Lemons’: Quality Uncertainty and the Market Mechanism, *Quarterly Journal of Economics* 84, 488–500
 - Grossman, S. and J. Stiglitz, 1980, On the Impossibility of Informationally Efficient Markets, *American Economic Review* 70, 393–408.
 - * Kyle, A., 1985, Continuous Auctions and Insider Trading, *Econometrica* 53, 1315–35
 - Kyle, A., 1989, Informed Speculation with Imperfect Competition, *Review of Economic Studies* 56, 317–56
 - * Glosten, L., and P. Milgrom, 1985, Bid, Ask, and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders, *Journal of Financial Economics* 13, 71–100.
 - Campbell, J. and A. Kyle, 1993, Smart Money, Noise Trading and Stock Price Behaviour, *Review of Economic Studies* 60, 1–34
 - Wang, J., 1993, A Model of Intertemporal Asset Prices under Asymmetric Information, *Review of Economic Studies* 60, 249–82
 - Hong, H. and J. Wang, 2000, Trading and Returns under Periodic Market Closures, *Journal of Finance* 55, 297–354
 - Gârleanu, N. and L. Pedersen, 2004, Adverse Selection and the Required Return, *Review of Financial Studies* 17, 643–65
 - Financing constraints:
 - * Shleifer, A. and R. Vishny, 1997, The Limits of Arbitrage, *Journal of Finance* 52, 35–55
 - Gromb, D., and Vayanos, D., Equilibrium and Welfare in Markets with Financially Constrained Arbitrageurs, *Journal of Financial Economics* 66, 361–407
 - Liu, J., and F. Longstaff, 2004, Losing Money on Arbitrage: Optimal Dynamic Portfolio Choice in Markets with Arbitrage Opportunities, *Review of Financial Studies* 17, 611–41
 - Brunnermeier, M. and L. Pedersen, 2006, Market Liquidity and Funding Liquidity, *Review of Financial Studies* 22, 2201–38
 - * Gârleanu, N. and L. Pedersen, 2011, Margin-Based Asset Pricing, *Review of Financial Studies* 24, 1980–2022.

- Brunnermeier, M., and I. Sannikov, 2010, A Macroeconomic Model with a Financial Sector, working paper
 - He, Z., and A. Krishnamurthy, 2010, Intermediary Asset Pricing, working paper
 - * He, Z., and A. Krishnamurthy, 2011, A Model of Capital and Crises, *Review of Economics Studies*, forthcoming
- Limited capital availability or mobility
 - * Grossman, S., and M. Miller, 1988, Liquidity and Market Structure, *Journal of Finance* 43, 617–37
 - Campbell, J. and S. Grossman, and J. Wang, 1993, Trading Volume and Serial Correlation in Stock Returns, *Quarterly Journal of Economics* 108, 905–39
 - Llorente, G., R. Michaely, G. Saar, and J. Wang, 2002, Dynamic Volume-Return Relation of Individual Stocks, *Review of Financial Studies* 15, 1005–47
 - * Greenwood, Robin. Short- and Long-term Demand Curves for Stocks: Theory and Evidence on the Dynamics of Arbitrage. *Journal of Financial Economics* 75, no. 3 (March 2005): 607-649.
 - Wurgler, J. and Zhuravskaya, 2002, Does Arbitrage Flatten Demand Curves for Stocks?, *Journal of Business*, vol 7, 583–608
 - Newman, Y. and M. Riersen, 2004, Illiquidity Spillovers: Theory and Evidence From European Telecom Bond Issuance, mimeo, Stanford GSB
- Derivative pricing
 - Constantinides, G. and S. Perrakis, 2002, Stochastic dominance bounds on derivatives prices in a multiperiod economy with proportional transaction costs, *Journal of Economic Dynamics and Control* 26, 1323–52
 - Constantinides, G., J. Jackwerth, and S. Perrakis, 2009, Mispricing of S&P 500 Index Options, *Review of Financial Studies* 22, 1246–77
 - Bollen, N. and R. Whaley, 2004, Does Net Buying Pressure Affect the Shape of Implied Volatility Functions?, *Journal of Finance* 49, 711–754
 - * Gârleanu, N., L. Pedersen, and A. Poteshman, 2009, Demand-Based Option Pricing, *Review of Financial Studies* 22, 4259–99
 - Gabaix, X., A. Krishnamurthy, and O. Vigneron, 2007, Limits of Arbitrage: Theory and Evidence from the Mortgage Backed Securities Market, *Journal of Finance*
- Search frictions:
 - Duffie, D., N. Gârleanu, and L. Pedersen, 2005, Over-the-Counter Markets, *Econometrica* 73, 1815-48
 - * Duffie, D., N. Gârleanu, and L. Pedersen, 2006, Valuation in Over-the-Counter Markets, *Review of Financial Studies*
 - Vayanos, D., and P.-O. Weill, 2008, A Search-Based Theory of the On-the-Run Phenomenon, *Journal of Finance*
 - Weill, P.-O., 2004, Leaning Against the Wind, *Review of Economic Studies*
 - Vayanos, D. and T. Wang, 2003, Search and Endogenous Concentration of Liquidity in Asset Markets, *Journal of Economic Theory*
 - Gârleanu, N., Portfolio Choice and Pricing in Illiquid Markets, *Journal of Economic Theory*

- Short-sale constraints, differences of opinions, and securities lending
 - Miller Edward M, Risk, Uncertainty, and Divergence of Opinion, *Journal of Finance*, vol. 32, no. 4, Sept. 1977, pp. 1151-68
 - * Harrison, M., and D. Kreps, 1978, Speculative Investor Behavior in a Stock Market with Heterogeneous Expectations, *Quarterly Journal of Economics* 92, 323–336
 - Diamond, Douglas W; Verrecchia, Robert E, Constraints on Short-Selling and Asset Price Adjustment to Private Information, *Journal of Financial Economics*, vol. 18, no. 2, June 1987, pp. 277-311
 - Scheinkman, J., and W. Xiong, 2003, Overconfidence and Speculative Bubbles, *Journal of Political Economy*
 - Duffie, D., 1996, *Journal of Finance*
 - Duffie, D., N. Gârleanu, and L. Pedersen, 2002, Securities Lending, Shorting, and Pricing, *Journal of Financial Economics* 66, 307–39
 - Krishnamurthy, A., 2002, The Bond/Old-Bond Spread, *Journal of Financial Economics* 66
 - Simsek, A., 2011, Belief Disagreements and Collateral Constraints, working paper

- Time-varying liquidity and liquidity risk:
 - Chordia, T., R. Roll, and A. Subrahmanyam, 2000, Commonality in Liquidity, *Journal of Financial Economics* 59, 3–28
 - Hasbrouck, J., and D. Seppi, 2001, Common Factors in Prices, Order Flows, and Liquidity, *Journal of Financial Economics* 59, 383–411
 - Pastor, L. and R. Stambaugh, 2003, Liquidity risk and expected stock returns, *Journal of Political Economy* 111, 642–85
 - Acharya, V. and L. Pedersen, 2005, Asset Pricing with Liquidity Risk, *Journal of Financial Economics*,
 - Vayanos, D., 2004, Flight to Quality, Flight to Liquidity, and the Pricing of Risk, mimeo, London School of Economics

- Corporate-finance effects
 - Holmstrom, B., and J. Tirole, 2001, LAPM: A Liquidity-Based Asset Pricing Model, *Journal of Finance* 56, 1837–67
 - Eisfeldt, A., 2004, Endogenous Liquidity in Asset Markets, *Journal of Finance* 59, 1–30

- Institutional developments motivated by liquidity:
 - Gorton and Pennacchi (1990)
 - Subrahmanyam (1989)
 - Holmstrom and Tirole (1993)
 - DeMarzo and Duffie (1999), etc.

- Liquidity of financial systems:
 - Diamond and Dybvig (1982)
 - Allen and Gale (1994, 2004, etc.)

– Morris and Shin (2004, etc.)

The course is not intended to be a market microstructure course, but some of the topics studied do belong to market microstructure.