

Econ 8200-003  
Search Theory and Applications  
Fall 2024

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**Class Schedule:** Thursday, 5:15 - 8:15 pm

**Textbook:** There is no textbook for the course. The course will be based on published and working papers.

## 1 Content and Objective

Search-theoretic models of exchange have proven extremely useful in understanding certain markets and phenomena that are difficult — if not impossible — to understand within the traditional, frictionless Walrasian paradigm. This course will introduce the fundamental tools and models that are used in search theory, and explore applications in several key areas of research.

The first application we will cover is that of long-term relationships in frictional markets, with the leading example being the labor market. The primary objective in this section of the course is to understand the optimal behavior of workers looking for a job, the optimal contracts that firms offer, and the implied equilibrium dynamics. We will consider a variety of models, and address topics such as unemployment duration, wage dispersion, the equilibrium level of unemployment, worker flows, and mismatch.

The second topic that we will cover focuses on spot trades in decentralized markets, with the leading example being over-the-counter financial markets. The primary objective in this section of the course is to understand the types of intermediaries and financial institutions that arise to overcome frictions in the exchange of assets, and how these trading arrangements affect asset prices and liquidity. We will consider several different model specifications, and address topics such as asset pricing, liquidity, and market microstructure.

The last topic that we will cover is the introduction of asymmetric information into environments with search frictions. Again, we will consider several different model specifications, and study how information frictions distort trade in frictional markets, and how certain policies can either ease or exacerbate these distortions.

## 2 Course Outline

### 2.1 The basics

- Some helpful mathematical review:
  - Poisson processes and bargaining theory
- The basic job search model:
  - McCall (1970)
- Price posting and the Diamond paradox:
  - Diamond (1971)

### 2.2 Labor markets

#### Benchmark models

- Random search and bargaining:
  - Mortensen and Pissarides (1994), Hosios (1990),
- Price posting, wage dispersion, and on-the-job search
  - Burdett and Judd (1983), Burdett and Mortensen (1998), Postel-Vinay and Robin (2002)
- Competitive/directed search models
  - Moen (1997), Burdett et al. (2001), Menzio and Shi (2011)

#### Applications

- We will use these models to study:
  - The determinants of unemployment and fluctuations over the cycle.
  - The determinants of wages, wage dispersion, and wage growth over time.
  - Match quality, productivity, and output.
  - The effects of labor market policies.
- Quantitative assessments of labor search models
  - Shimer (2005b), Hornstein et al. (2011)

## Extras

- If we have time, we might also cover:

Sorting and matching: Shi (2001), Shimer (2005a), Eeckhout and Kircher (2010)

Stock-flow matching models: Coles and Smith (1998)

Incorporating wage-tenure contracts: Burdett and Coles (2003), Shi (2009)

## 2.3 Over-the-counter Financial Markets

### Benchmark models

- Pure decentralized markets:

Duffie et al. (2007), Hugonnier et al. (2022),

- Semi-centralized markets:

Duffie et al. (2005), Lagos and Rocheteau (2009), Lester et al. (2015)

### Applications

- We will use these models to study:
  - The determinants of liquidity.
  - The welfare cost of trading frictions.
  - The role of intermediaries.
- Some quantitative assessments of OTC models:

Gavazza (2016), Hugonnier et al. (2020)

## Extras

- If we have time, we might also cover:

Search-theoretic models of money: Lagos and Wright (2005)

Monetary policy, liquidity, and asset prices: Lagos (2010), Lester et al. (2012)

## 2.4 Asymmetric information in frictional markets

### Benchmark Models

- Random search environment:  
Chiu and Koepl (2016), Bethune et al. (2022)
- Competitive search environment:  
Guerrieri et al. (2010), Guerrieri and Shimer (2014)
- Semi-competitive environment:  
Lester et al. (2018)

### Applications

- We will use these models to study:
  - The effects of adverse selection in labor markets.
  - Learning and information aggregation in OTC market.
  - Market “freezes” and the effects of policy interventions.

## References

- Bethune, Zachary, Bruno Sultanum, and Nicholas Trachter**, “An information-based theory of financial intermediation,” *The Review of Economic Studies*, 2022, 89 (5), 2381–2444.
- Burdett, Ken and Melvyn Coles**, “Equilibrium wage-tenure contracts,” *Econometrica*, 2003, 71 (5), 1377–1404.
- Burdett, Kenneth and Dale T Mortensen**, “Wage differentials, employer size, and unemployment,” *International Economic Review*, 1998, pp. 257–273.
- and **Kenneth L Judd**, “Equilibrium price dispersion,” *Econometrica: Journal of the Econometric Society*, 1983, pp. 955–969.
- , **Shouyong Shi, and Randall Wright**, “Pricing and matching with frictions,” *Journal of Political Economy*, 2001, 109 (5), 1060–1085.
- Chiu, Jonathan and Thorsten V Koepl**, “Trading dynamics with adverse selection and search: Market freeze, intervention and recovery,” *The Review of Economic Studies*, 2016, 83 (3), 969–1000.
- Coles, Melvyn G and Eric Smith**, “Marketplaces and matching,” *International Economic Review*, 1998, pp. 239–254.
- Diamond, Peter A**, “A model of price adjustment,” *Journal of economic theory*, 1971, 3 (2), 156–168.
- Duffie, Darrell, Nicolae Gârleanu, and Lasse Heje Pedersen**, “Over-the-counter markets,” *Econometrica*, 2005, 73 (6), 1815–1847.
- , —, and —, “Valuation in over-the-counter markets,” *The Review of Financial Studies*, 2007, 20 (6), 1865–1900.
- Eeckhout, Jan and Philipp Kircher**, “Sorting and decentralized price competition,” *Econometrica*, 2010, 78 (2), 539–574.
- Gavazza, Alessandro**, “An empirical equilibrium model of a decentralized asset market,” *Econometrica*, 2016, 84 (5), 1755–1798.
- Guerrieri, Veronica and Robert Shimer**, “Dynamic adverse selection: A theory of illiquidity, fire sales, and flight to quality,” *American Economic Review*, 2014, 104 (7), 1875–1908.
- , —, and **Randall Wright**, “Adverse selection in competitive search equilibrium,” *Econometrica*, 2010, 78 (6), 1823–1862.
- Hornstein, Andreas, Per Krusell, and Giovanni L Violante**, “Frictional wage dispersion in search models: A quantitative assessment,” *American Economic Review*, 2011, 101 (7), 2873–98.
- Hosios, Arthur J**, “On the efficiency of matching and related models of search and unemployment,” *The Review of Economic Studies*, 1990, 57 (2), 279–298.

- Hugonnier, Julien, Benjamin Lester, and Pierre-Olivier Weill**, “Frictional intermediation in over-the-counter markets,” *The Review of Economic Studies*, 2020, 87 (3), 1432–1469.
- , – , and – , “Heterogeneity in decentralized asset markets,” *Theoretical Economics*, 2022, 17 (3), 1313–1356.
- Lagos, Ricardo**, “Asset prices and liquidity in an exchange economy,” *Journal of Monetary Economics*, 2010, 57 (8), 913–930.
- and **Guillaume Rocheteau**, “Liquidity in asset markets with search frictions,” *Econometrica*, 2009, 77 (2), 403–426.
- and **Randall Wright**, “A unified framework for monetary theory and policy analysis,” *Journal of political Economy*, 2005, 113 (3), 463–484.
- Lester, Benjamin, Ali Shourideh, Venky Venkateswaran, and Ariel Zetlin-Jones**, “Screening and adverse selection in frictional markets,” *Journal of Political Economy*, 2018, *forthcoming*.
- , **Andrew Postlewaite, and Randall Wright**, “Information, liquidity, asset prices, and monetary policy,” *The Review of Economic Studies*, 2012, 79 (3), 1209–1238.
- , **Guillaume Rocheteau, and Pierre-Olivier Weill**, “Competing for order flow in OTC markets,” *Journal of Money, Credit and Banking*, 2015, 47 (S2), 77–126.
- McCall, John Joseph**, “Economics of information and job search,” *The Quarterly Journal of Economics*, 1970, pp. 113–126.
- Menzio, Guido and Shouyong Shi**, “Efficient search on the job and the business cycle,” *Journal of Political Economy*, 2011, 119 (3), 468–510.
- Moen, Espen R.**, “Competitive search equilibrium,” *Journal of political Economy*, 1997, 105 (2), 385–411.
- Mortensen, Dale T and Christopher A Pissarides**, “Job creation and job destruction in the theory of unemployment,” *The review of economic studies*, 1994, 61 (3), 397–415.
- Postel-Vinay, Fabien and Jean-Marc Robin**, “Equilibrium wage dispersion with worker and employer heterogeneity,” *Econometrica*, 2002, 70 (6), 2295–2350.
- Shi, Shouyong**, “Frictional Assignment. I. Efficiency,” *Journal of Economic Theory*, 2001, 2 (98), 232–260.
- , “Directed search for equilibrium wage–tenure contracts,” *Econometrica*, 2009, 77 (2), 561–584.
- Shimer, Robert**, “The assignment of workers to jobs in an economy with coordination frictions,” *Journal of Political Economy*, 2005, 113 (5), 996–1025.
- , “The cyclical behavior of equilibrium unemployment and vacancies,” *American economic review*, 2005, 95 (1), 25–49.