

Matching and Price Theory

MFI conference

Chicago, May 2011

Al Roth

- Decentralized Matching with Aligned Preferences, Muriel Niederle and Leeat Yariv
- Market vs. Design: Congestion and Evaluation Costs, Ilya Segal
- These papers help us think about market design for decentralized markets.

Simple and not so simple markets

- Commodity markets are relatively simple:
- You pay your money and you take your choice: buyers choose what they want from what they can afford.
- The function of the market is mostly price discovery, and the equilibrium prices decentralize the market, with a low-dimensional set of prices (one for each commodity).
- A lot of market design for price discovery has been done on auction markets, some for simple commodities, some for packages of complements (e.g. Milgrom et al.).

Matching markets

- There are lots of things you can't simply choose, you also have to be *chosen*.
 - Jobs
 - Schools
 - Organ transplants
 - Spouses
- Some of these “matching” markets don't even use money, and even in those that do, money has a different role than in markets for commodities (e.g. “doubly personalized prices”)

Achieving stable matchings

- Centralized clearinghouses can do it, because they can compare lots of transactions
- How about decentralized markets?
- Leeat and Muriel: easy enough if preferences are aligned and no cost of making offers
- Ilya: easy enough if preferences are defined by functions of a very small number of attributes.
- Both: potentially quite hard otherwise.
- That is, when at least one side of the market looks a bit commodity like, or the market imposes some other sort of simple order (so that the stable matching is unique), decentralized markets may not have too much difficulty producing stable matchings...

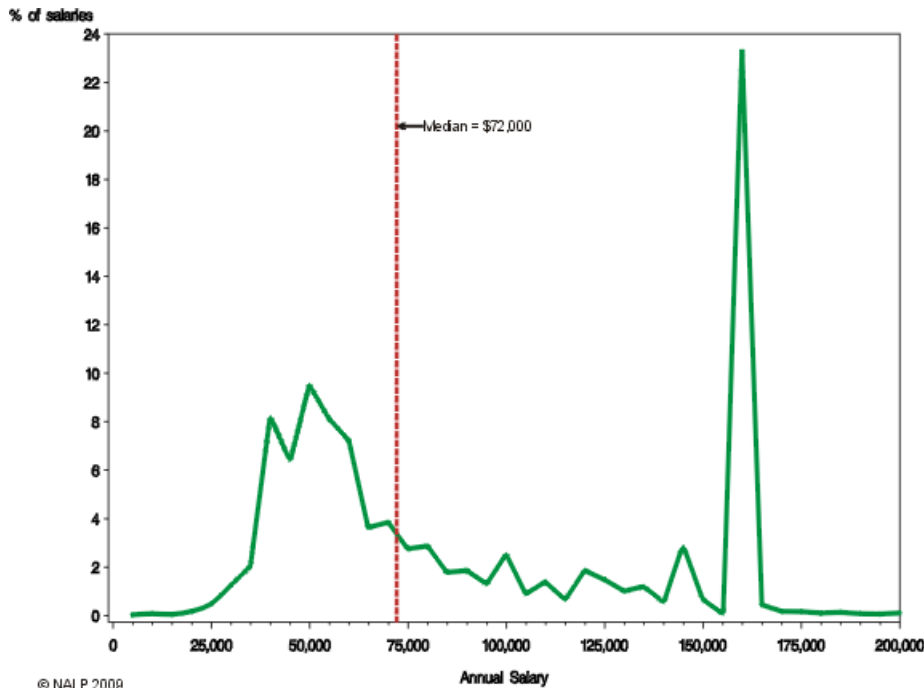
Obstacles to stability

- Frictions, of course. (e.g. search costs)
- Congestion (sometimes reduced by signaling)
 - That's the thought behind the signaling mechanism before ASSA meeting interviews

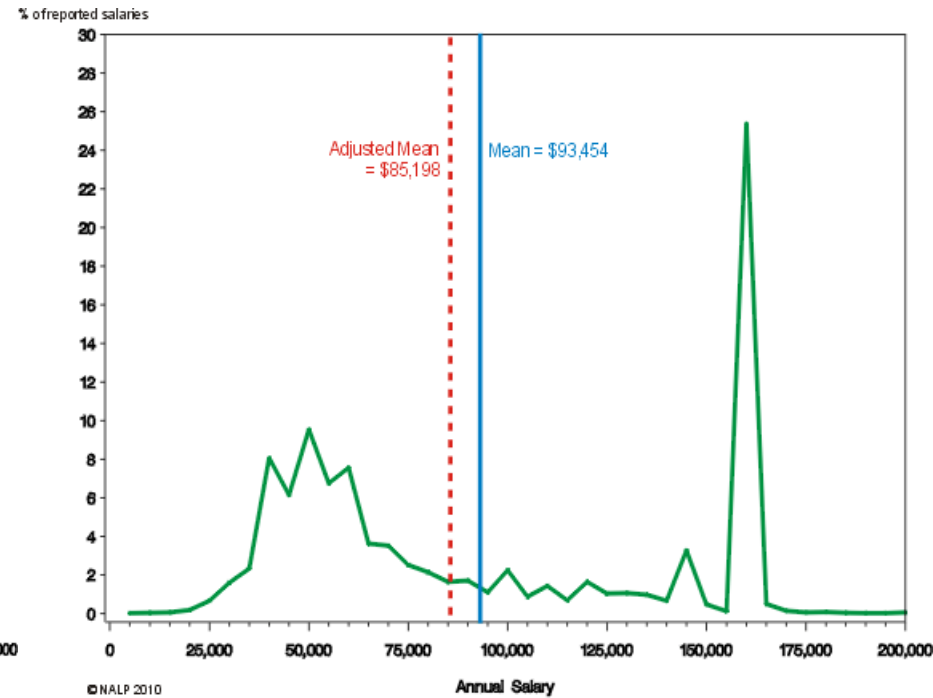
Even in markets with freely adjustable prices, there may be lots of impersonal prices

- U. Chicago doesn't choose its freshman class by raising tuition until just enough (qualified) applicants remain: it sets tuition so that lots of students would like to come, and then admits a subset (which it still has to woo...)

Law salaries for class of 2008, 9



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Not all decentralized markets look as competitive as colleges and law firms

- When there's lots of heterogeneity, finding stable matchings, or finding doubly personalized prices, may require lots of comparisons.
- But comparisons may be hard to make, partly because participants can make them hard to make.

Exploding offers (and prices)

- ---
- From a recent NY Times [article on recruiting in Silicon Valley](#):

"Two executives at a small start-up who spoke on the condition of anonymity said it recently lost an intern when one of the biggest start-ups offered the candidate a 40 percent bump in stock options, potentially worth hundreds of thousands of dollars —

.

Unraveling (and prices)

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- Kevin Roose at Dealbook writes of [A Grab for Wall Street's Rising Stars Before They've Risen](#)

"Some of the world's largest private equity firms are in a tug of war over top talent. But the competition isn't over brand-name executives commanding eight-figure salaries. Instead, firms are fighting for the affections of bankers barely old enough to rent cars.

"
", an annual Wall Street ritual in which young analysts from leading investment banks like Goldman Sachs and Morgan Stanley are wined and dined by Kohlberg Kravis Roberts, the Blackstone Group, TPG Capital and a handful of other top-flight firms.

"
," said a senior partner at a large private equity firm, who spoke on the condition of anonymity because he was not authorized to comment on the hiring process.

The Crimson reports that Harvard cares about equilibrium: [Harvard Announces Return of Early Action Admissions Program](#)

"

"The announcement comes after the University of Virginia—which, along with Princeton, followed Harvard in deciding to eliminate early admissions programs in the fall of 2006—rolled out a new early action program in November.

"University President Drew G. Faust said in a statement that

Steve Cohen at Forbes tabulates some admissions figures in his blog post: [Early Decision: College Admission's Secret Handshake](#)

College Percentage of Class Filled by Early Acceptances

Brown 38%

Columbia 59%

Cornell 37%

Dartmouth 42%

Penn 50%

Williams 41%

Colgate 43%

Kenyon 38%

Lafayette 43%

Rice 27%

July 2010 [Northwestern Law, Jones Day Agree to On-Campus Interviewing in September](#) (of beginning of 2nd year)

"CHICAGO ---

In a move benefiting both students and law firms, Jones Day will conduct interviews on behalf of its 14 U.S. offices on Monday, Sept. 13.

"

"The current system discourages the efforts of law firms to learn about all the competencies (over and above grades) of potential associates," according to David Van Zandt, dean, Northwestern Law. "It also requires firms to make employment decisions and predictions about their hiring needs too far in advance of permanent start dates.

Potential inefficiencies

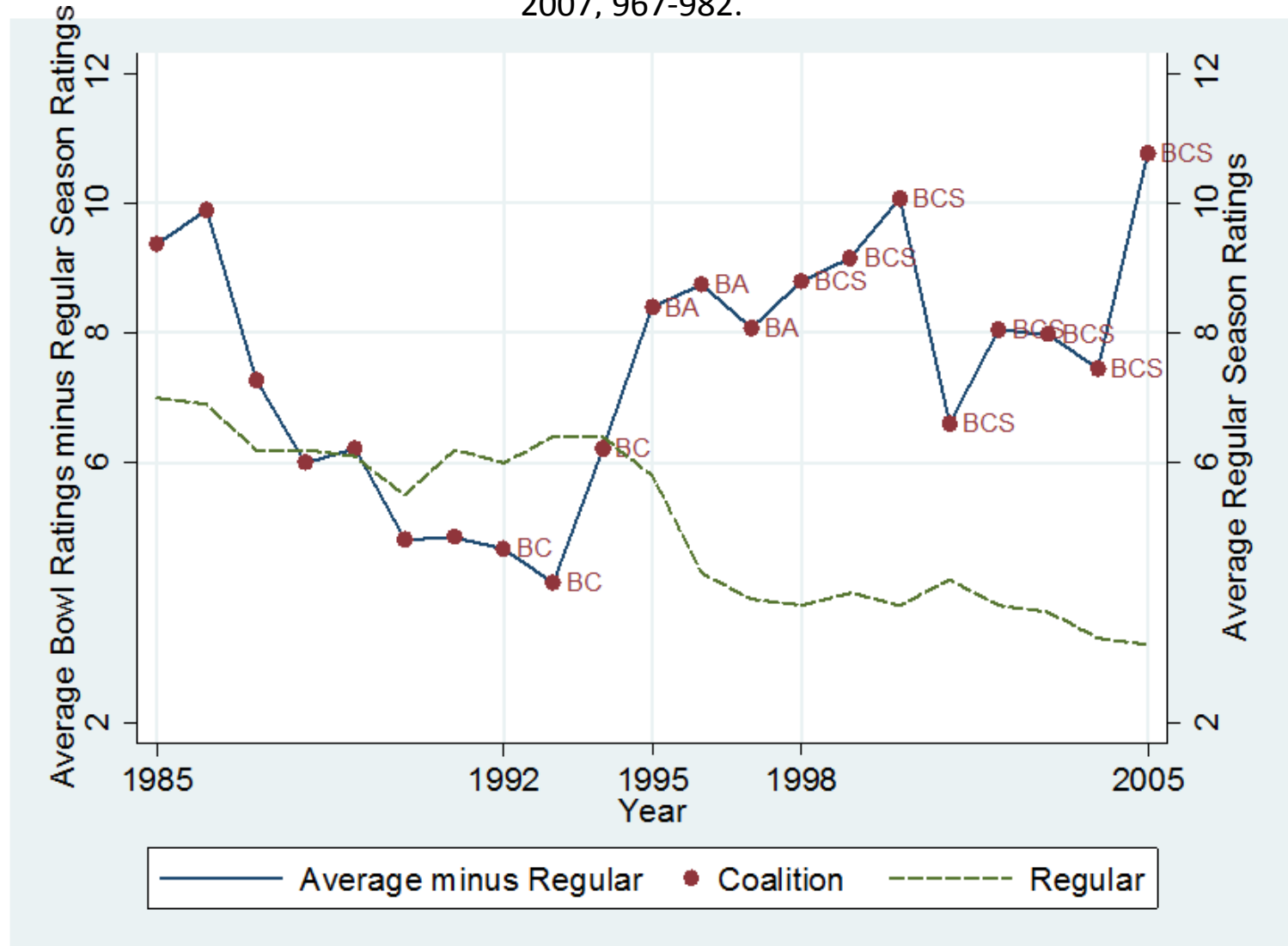
The NALP reports:

“From the employer perspective,

. While it is impossible to determine the exact number of associates whose start dates were deferred, analyses of the survey data from law schools and law firms suggests that the number was at least 3,200 and could be as high as 3,700.” NALP (2010b).

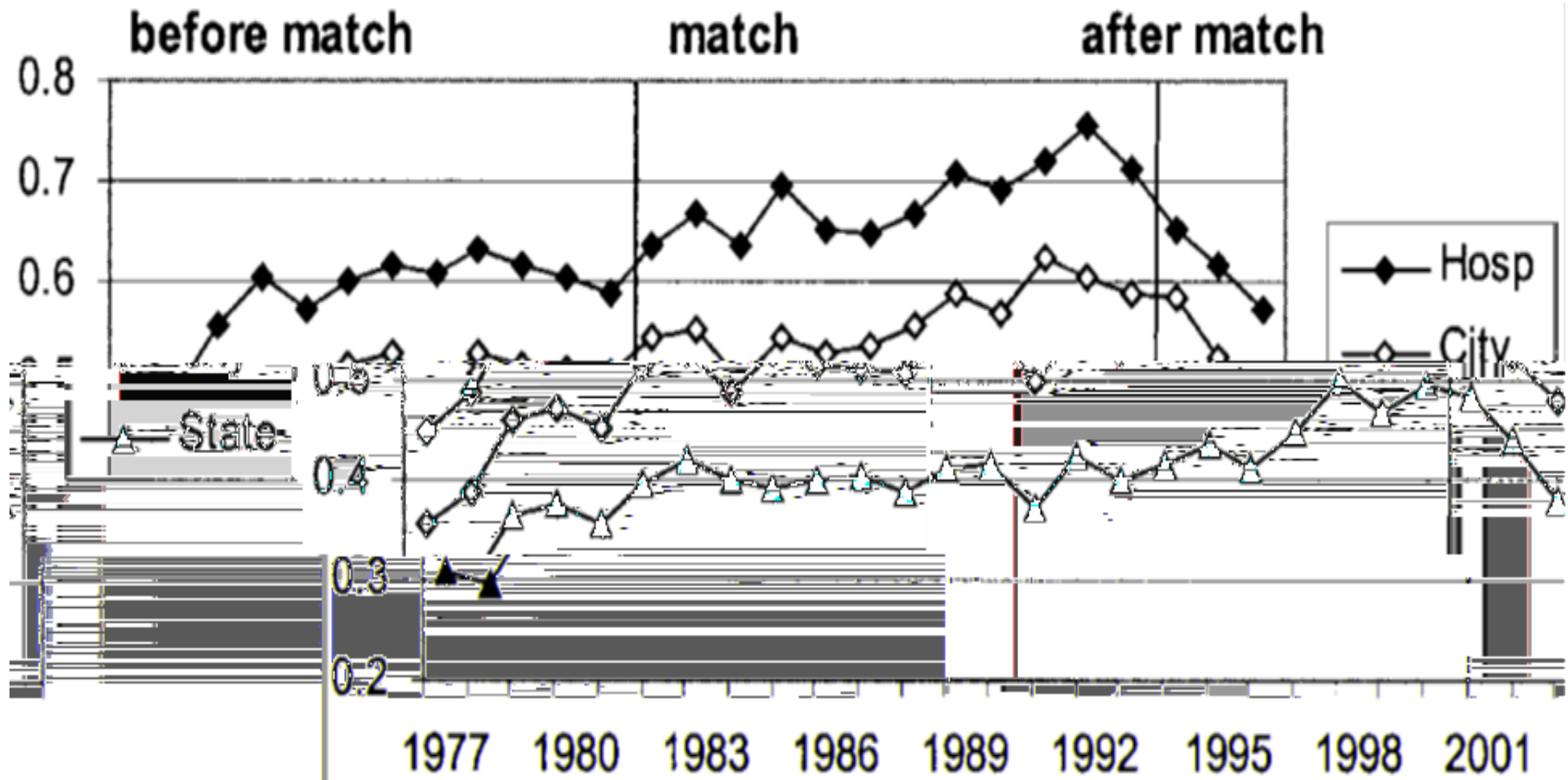
Football bowls

, Alvin E. Roth, and , “Unraveling Yields Inefficient Matchings: Evidence from Post-Season College Football Bowls,” *Rand Journal of Economics*, 38, 4, Winter 2007, 967-982.



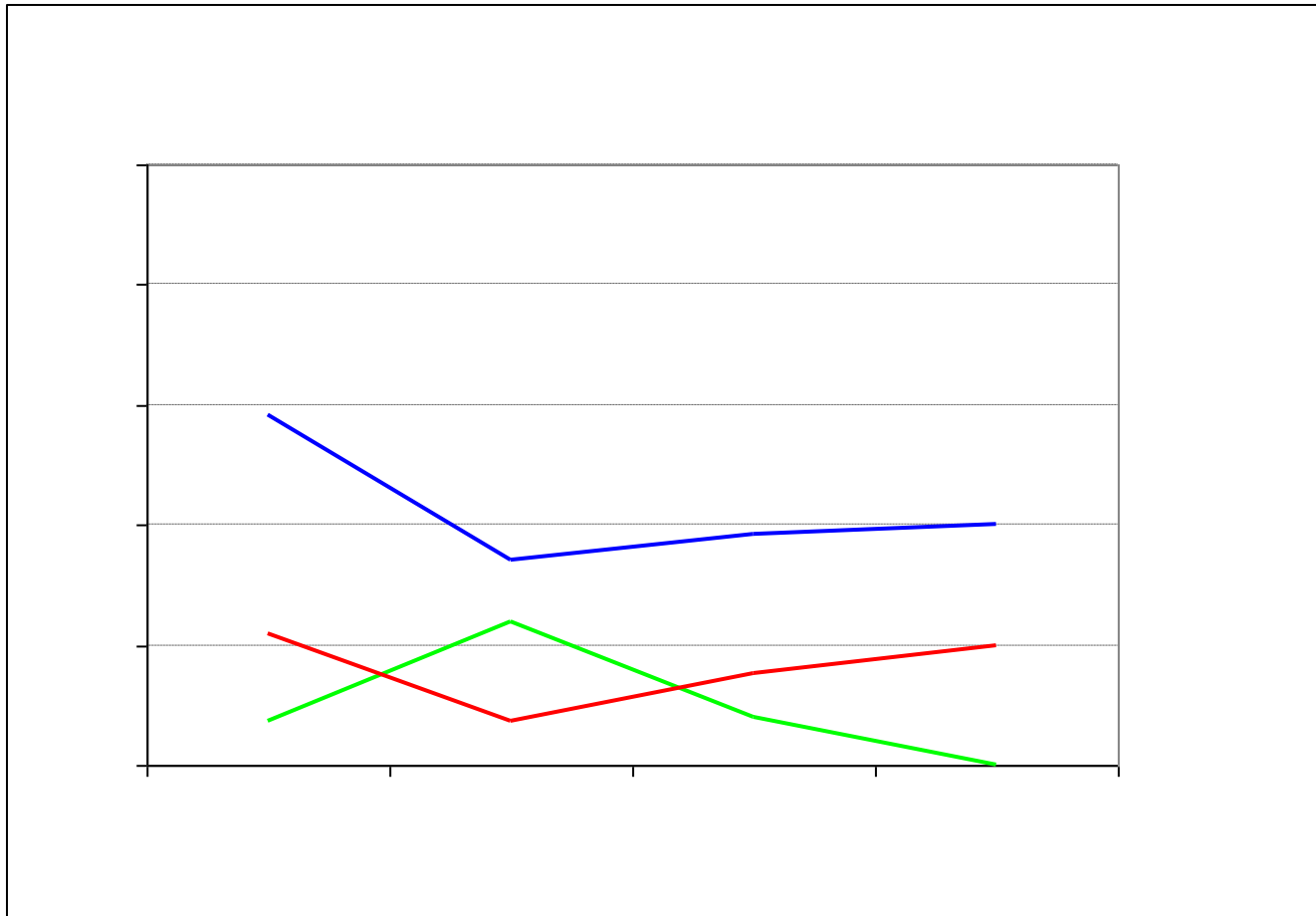
Gastroenterologists

and Alvin E. Roth, "Unraveling reduces mobility in a labor market: Gastroenterology with and without a centralized match," *Journal of Political Economy*, 111, 6, December 2003, 1342-1352.



Not everyone loses...(so it can be hard to get consensus on reversing unraveling:)

Niederle, Muriel and Alvin E. Roth, "Market Culture: How Rules Governing Exploding Offers Affect Market Performance," *American Economic Journal: Microeconomics*, 1, 2, August 2009, 199-219.



Decentralized market design



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