Fraternities and Labor Market Outcomes

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Fraternities

- We study the situation where productivity irrelevant activity is job market relevant.
- Fraternity membership is more than "club good":
  - too expensive;
  - many people mention them on resumes.

Results Preview

- In an empirically relevant equilibrium some people would be accepted but do not apply.
- Fraternity screens out low-ability people, therefore low-ability people earn the most from the outcome.
- High-ability people self-select themselves out of fraternity.
- Biggest losers are lowest types who are not admitted.

The World

- New labor market participants are *students*, mass 1.
- Each student can be represented as a pair $(\theta, \mu) \sim h(\cdot) > 0$.
  - θ is student's potential productivity after employment.
  - μ is student's socializing value.
  - θ and μ are independent.
- Students like money and socializing.
- The representative *fraternity* likes students with high μ and students with high expected wage; has limited capacity.
- *Firms* offer competitive wages:
  - firms observe club membership and a signal about productivity $\widetilde{\theta} \sim f_{\widetilde{\theta}}(\cdot|\theta)$;
  - wage is equal to expected θ conditional on observables.

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Game Timing

1. Students, having beliefs about wage structure, decide whether it is profitable to join the fraternity.
2. The fraternity, having beliefs about set of applicants, picks an admittance rule.
3. Some students become fraternity members; values of productivity signals are realized.
4. Firms, having beliefs membership of students in fraternity, assign wages to combinations of $\widetilde{\theta}$ and membership status.

In a rational expectations equilibrium, everyone's beliefs are consistent with actions of everyone.

Firm's Problem

Each firm observes a continuum of students with pdf $h(\theta, \mu)$, has a common knowledge of signaling technology $f_{\widetilde{\theta}}(\widetilde{\theta}|\theta)$, and knows the distribution of students in (and out of) the fraternity

$$c(\theta, \mu) = I((\theta, \mu) \text{ is in the club})$$

Then the wage offered to a frat member with signal $\widetilde{\theta}$ is

$$w_C\left(\widetilde{\theta}\right) = E[\theta|\widetilde{\theta}, c(\cdot, \cdot)]$$

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Student's Problem

Students anticipate wages offered by firms, and possess a common knowledge about signaling technology $f_{\widetilde{\theta}}(\widetilde{\theta}|\theta)$.

Student (θ, μ)'s utility outside the fraternity is

$$U_{\bar{C}} = E_{\widetilde{\theta}}\left[w_{\bar{C}}(\widetilde{\theta})|\theta\right]$$

Student (θ, μ)'s utility inside the fraternity is

$$U_C = E_{\widetilde{\theta}}\left[w_C(\widetilde{\theta})|\theta\right] + n\mu - c$$

Students' solution is:

$$a(\theta, \mu) = I(U_C \geq U_{\bar{C}}|\theta, \mu) \qquad A = ((\theta, \mu)|a(\theta, \mu) = 1)$$

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The Fraternity's Problem

The fraternity observes set A and anticipates same wage functions as students do, and picks set B of admitted people. Club's utility function is assumed to be

$$W(B) = W_1 \int_{A \bigcap B} E_{\widetilde{\theta}} w_C(\widetilde{\theta}|\theta) dH(\theta, \mu) + W_2 \int_{A \bigcap B} \mu dH(\theta, \mu)$$

$$\text{s.t.} \int_{A \bigcap B} h(\theta, \mu) d\mu d\theta \leq \Gamma$$

Here Γ is a fraternity's capacity constraint. Intersection of sets of wishing students A and admitted students B is the set C — fraternity members.

Cutoff Rules

Proposition

There is a cutoff $\mu_A(\theta)$ such that people with μ bigger than that pledge.

Proposition

There is a cutoff $\mu_B(\theta)$ such that people with μ bigger than that are admitted.

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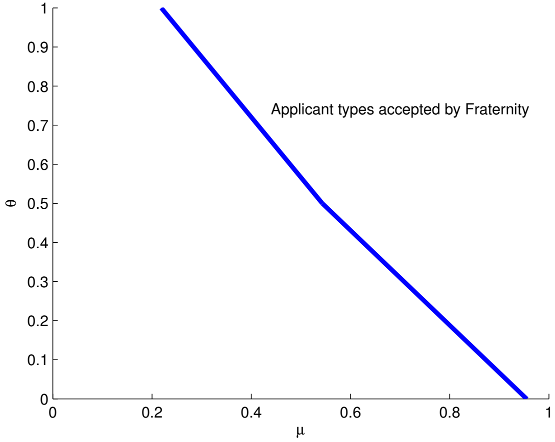
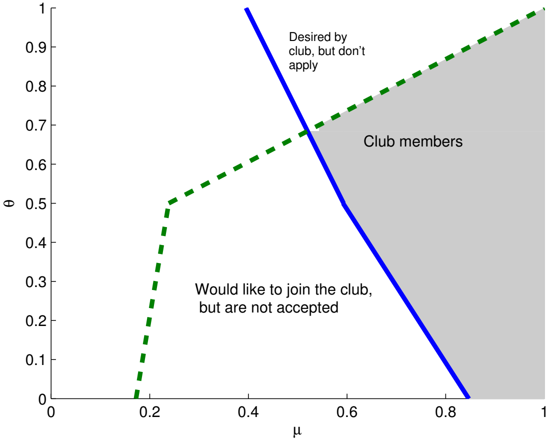
Fraternity's Cutoff Rule



Application-Constrained Equilibrium



Single-Peaked Equilibria

Assumption

Either the support for signals $\tilde{\theta}$ is finite, or the support of $f_{\tilde{\theta}}(\tilde{\theta}|\bar{\theta})$ is non-trivial.

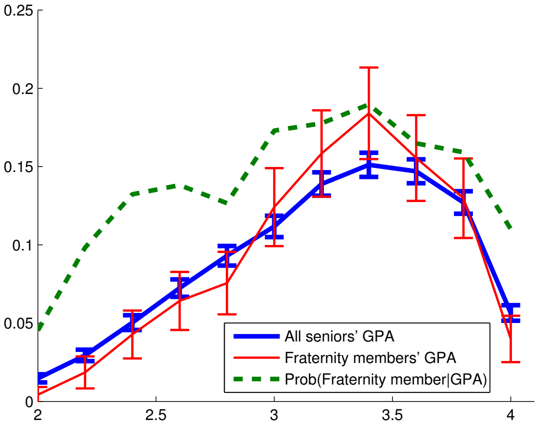
Assumption

The cost c of joining the fraternity satisfies $n\underline{\mu} + \bar{\theta} - E[\theta] < c < n\bar{\mu} + \bar{\theta} - E[\theta]$.

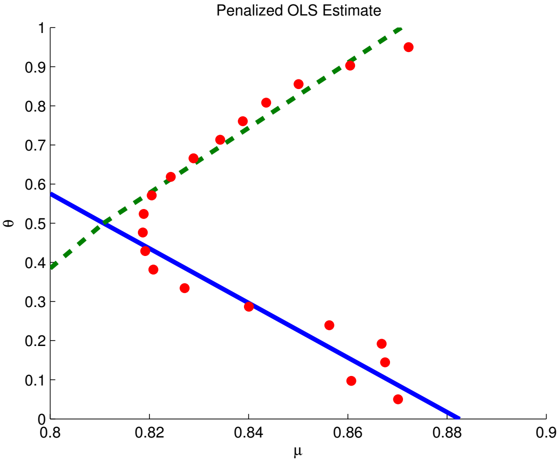
Proposition

Suppose that Assumptions 1 and 2 hold, and the fraternity is small enough, the equilibrium is single-peaked.

Estimation


0.25
0.2
0.15
0.1
0.05
0
2
2.5
3
3.5
4
All seniors' GPA
Fraternity members' GPA
Prob(Fraternity member|GPA)

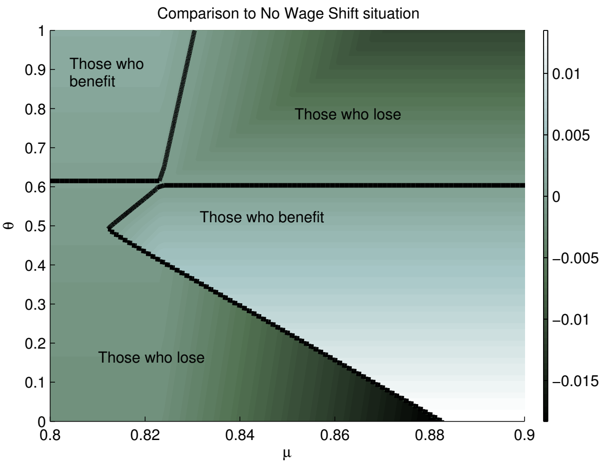
Structural Estimation



Parameters

Parameter	Estimate	95% confidence
n	0.2771	(0.1193, 0.5312)
c	0.2281	(0.0895, 0.4449)
c/n	0.8234	(0.7141, 0.8147)
W_1/W_2	0.2227	(0.0565, 0.3346)
Γ	0.1563	(0.1546, 0.1577)

Welfare Implications



Conclusion

- There is a “single-peaked” equilibrium which one cannot get with signalling, screening or networks.
- Single-peaked equilibrium exists very generally.
- We get single-peaked fraternity in estimates.
- “Single-peaked” effect is damaging for highly-able member students...
- ... damaging for low-able non-members...
- ... beneficial for low-type members.