

COMPETING BY RESTRICTING CHOICE: THE CASE OF SEARCH PLATFORMS

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Misiek Piskorski

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Platforms Research Symposium on July 13, 2017

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 - ▶ due to indirect network effects
 - ▶ strategic implication: provide as many candidates as possible

ONLINE DATING

MATCHMAKER

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 - ▶ More choice is bad: distaste for excessive choice (psychology), or cost of evaluating alternatives.

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- People differ in how much they dislike being alone.
And they may prefer to decrease the probability of being rejected rather than to improve the possible match.

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our model: desirability is *subjective*

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- **starting point**: everybody meets exactly one candidate

MODEL

- timing:
 - ▶ one period
 - ▶ in the beginning of the period agents see Λ^m and Λ^w , respectively, and decide whether to enter the relationship;
 - ▶ if both wanted to enter, they are in a relationship and receive Λ^m and Λ^w , respectively; if one of them did not want to enter, they are alone and receive α^m and α^w , respectively

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- lower \mathbf{a} 's are more desired, because of lower rejection probability

MATCHING RESULT

We can calculate a priori values for an agent characterized by α

- the probability of matching: $\frac{1}{2}(1 - \alpha)$
- expected value if matched: $\frac{1}{2}(1 + \alpha)$
- total expected payoff from participating in the market with one candidate

$$EU(\alpha) = \left(1 - \frac{1}{2}(1 - \alpha)\right) \cdot \alpha + \frac{1}{2}(1 - \alpha) \cdot \frac{1}{2}(1 + \alpha) = \frac{(1 + \alpha)^2}{4}$$

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In general: the more candidates you meet, the better the expected match, but also the higher the probability of being rejected

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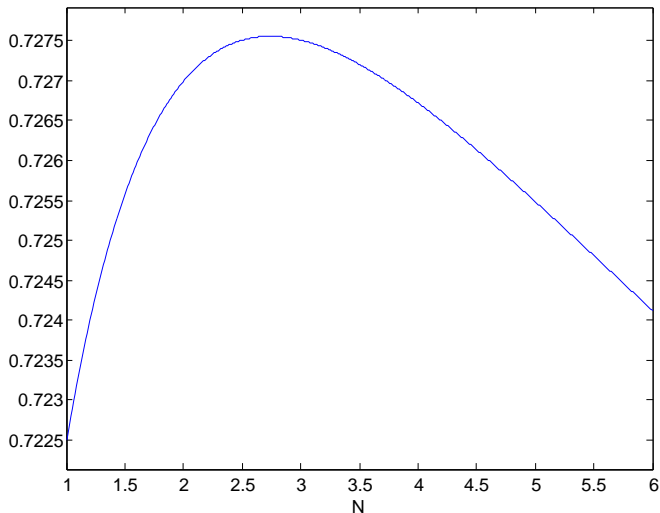
- the expected payoff for agent α first increases, then decreases with N

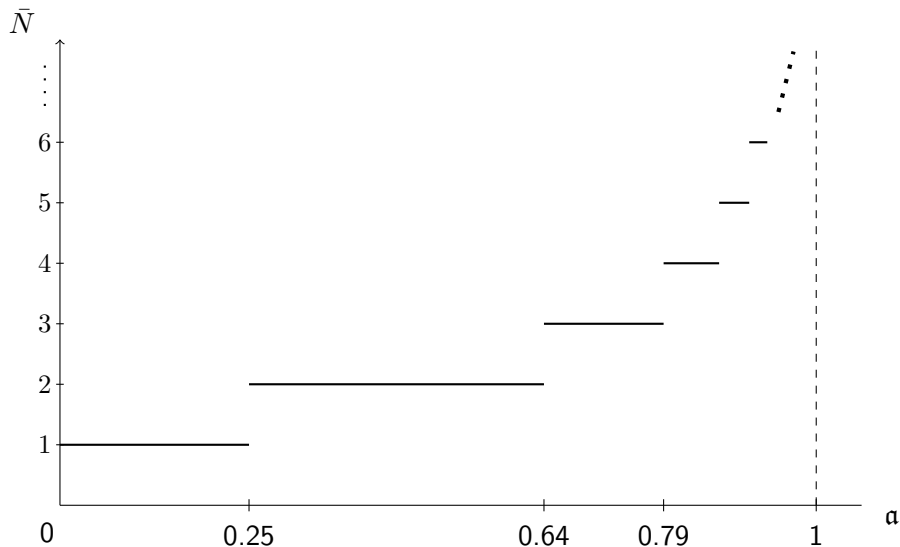
$$E\Pi(\alpha|N) = \frac{1}{(N+1)^2} \cdot \alpha^{N+1} + \frac{N}{N+1} \cdot \alpha + \frac{N}{(N+1)^2}$$

The indirect network effect is first positive and then negative.

POSITIVE NETWORK EFFECT REACHES LIMIT

$$E\Pi(\alpha = 0.7|N)$$



THE LIMIT TO THE NETWORK EFFECT DEPENDS ON α 

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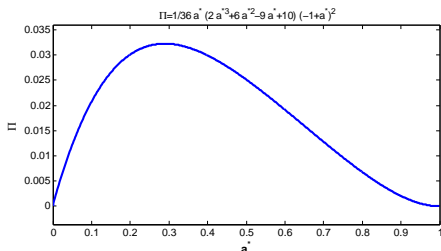
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- threshold $\mathbf{a}^*(f)$, s.t. $\mathbf{a} < \mathbf{a}^*(f)$ participate
- $\Pr(\text{rej}|M_1) = \frac{1}{2}\mathbf{a}^* < \frac{1}{2}$
- $\Pr(\text{rej}|OUT_2) = \frac{1}{6}((\mathbf{a}^*)^2 + \mathbf{a}^* + 4) > \frac{2}{3}$

MATCHMAKER'S PROBLEM

- α^* is indifferent:

$$EU(\alpha^*|M_1) - f = EU(\alpha^*|OUT_2) \implies f(\alpha^*)$$

- M_1 's profit is $\Pi(\alpha^*) = f \cdot \alpha^*$

 $f(\alpha^*)$


- unique interior solution α^*

GENERALIZATION

Proposition

- *outside market with any Ω candidates*
- *platform with any $N < \Omega$ candidates*
- *there exists an equilibrium where the platform charges a positive fee $f > 0$ and there is a threshold $\alpha^* \in (0, 1)$ such that*
 - ▶ *agents with $\alpha \in [0, \alpha^*)$ participate in the platform,*
 - ▶ *agents with $\alpha \in (\alpha^*, 1]$ stay in the outside market*
- *This is the only equilibrium with active platform for $N < \Omega$.*

[differentiated matchmakers](#)[jump to conclusions](#)

DISCUSSION

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- impatient agents \equiv low α
patient agents \equiv high α

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agents will only match with candidates of exactly the same type – large market makes it more likely

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- utility lower with correlation than without

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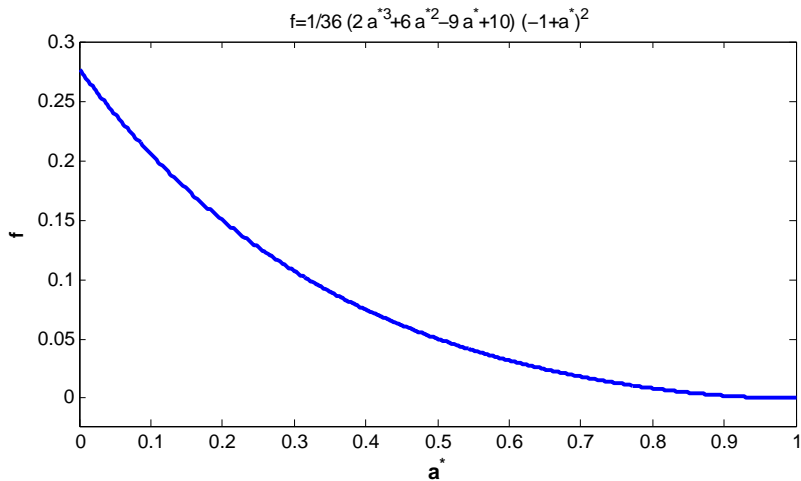
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MM1/out2: RELATIONSHIP BETWEEN f AND a^*



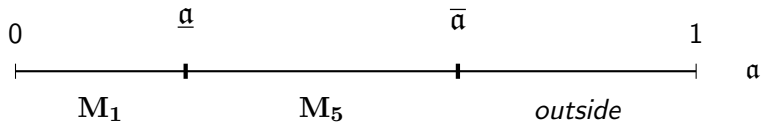
DIFFERENTIATED MATCHMAKERS — EXAMPLE

- *outside* market where everybody meets 2 candidates
- 2 matchmakers:
 - ▶ M_1 : offers meeting 1 candidate, and charges f_1
 - ▶ M_5 : offers meeting 5 candidates, and charges f_5

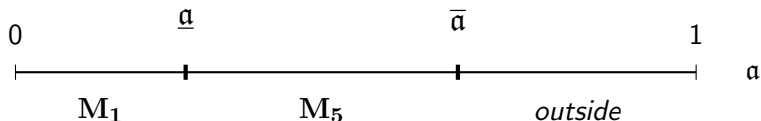
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- who wants to pay for meeting *fewer* people?

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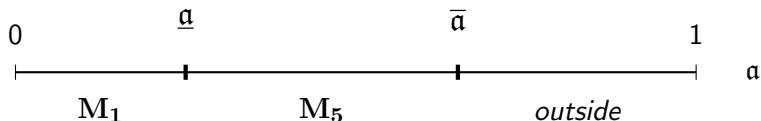


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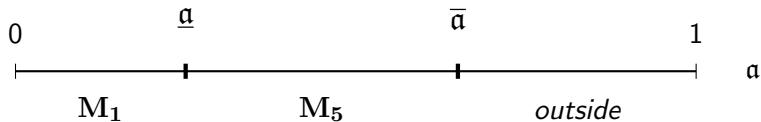
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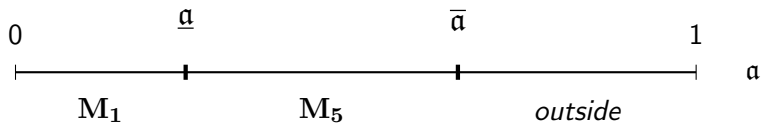
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- **intermediate** α 's prefer "better" match, and don't want to be *outside* (with the highest α 's)

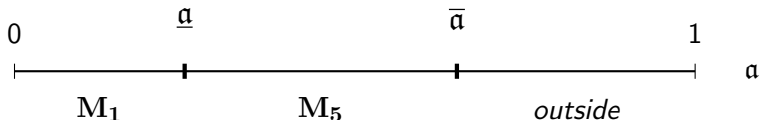
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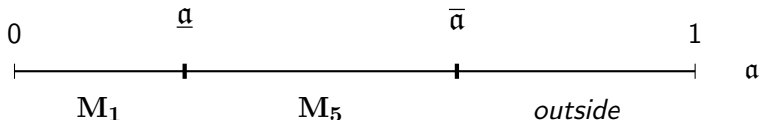
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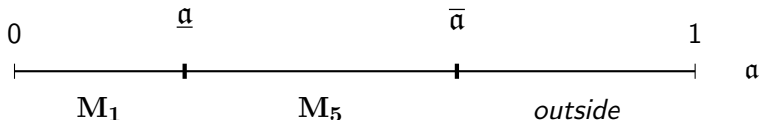
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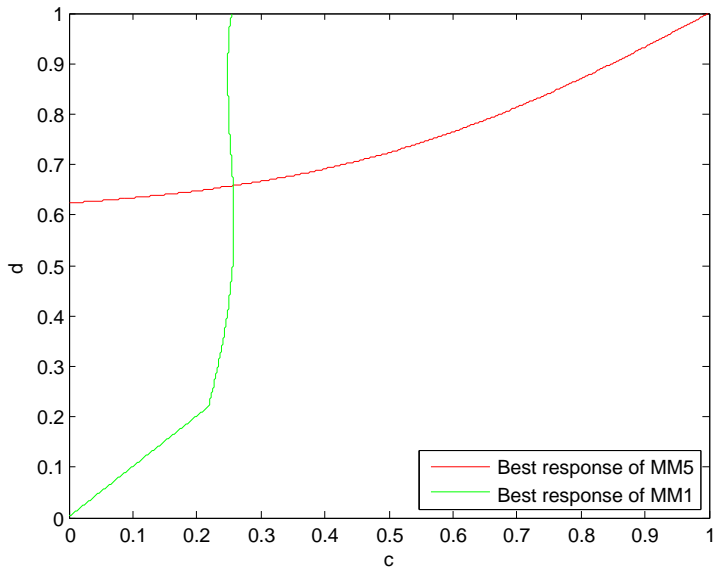
given \underline{a} , M_5 de facto chooses \bar{a} , to maximize $\Pi_{M_5} = (\bar{a} - \underline{a}) \cdot f_5$

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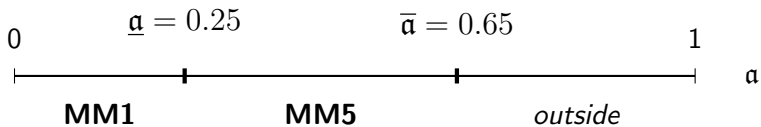
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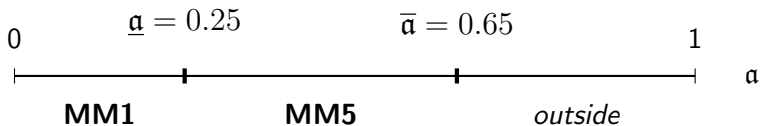


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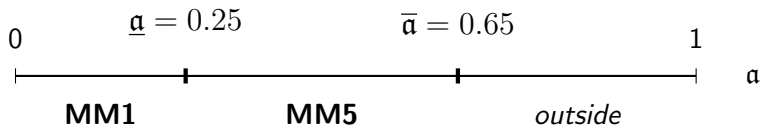
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- general for any number of platforms

◀ generalization

▶ conclusion