Delegated Recruitment and Hiring Distortions

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October 14, 2022

Motivation

- The share of Americans who got their job via a recruiter is rising.
- 4.2% in 1991 to 17.8% in 2020 (Black, Hasan, and Koning 2020)
- Recruiters are contracted agents finding talent on behalf of a firm.
- Are recruiter preferences over workers aligned with the firm?
- If not, how does delegation change the types of workers hired?

Summary of Results

1. Recruiters are not fully aligned.
2. The recruiter-firm relationship suffers from moral hazard with a multitasking flavor.
3. Delegation amplifies variance-based statistical discrimination.
4. Firms prefer using recruiters when workers have similar productivity variance.

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How are Recruiters Paid?

Based on three interviews with recruiters and a survey by Top Echelon:

- If a recruiter suggests a candidate, and this candidate is hired, they receive a commission.
- If the candidate leaves for any reason during a probation period they refund some or all of the commission.
- We call this a binary refund contract.

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The Model

Players and Actions

- Risk neutral firm which proposes the contract and fires worker if $a < 0$
- Risk neutral recruiter can accept or reject contract, conduct search

McCall-style sequential search with unit cost c

- Worker productivity denoted a
- Productivity is uncertain prior to hire: $a|(\mu, \sigma) = \mu + \sigma\epsilon$ with $\epsilon \sim F$ and $(\mu, \sigma) \sim G$
- μ is productivity expectation, σ is productivity variance

Contracts

Firms are restricted to binary refund contracts:

$$t(a) = \alpha - \beta \mathbb{I}\{a < 0\}$$

Payoffs

- Firm's profit:

$$\pi(a) = a - t(a)$$

  Note: firm gets productivity even if the worker is fired.

- Recruiter's utility given number of searches N:

$$u(a) = t(a) - Nc$$

- Recruiter's outside option is 0.

Example

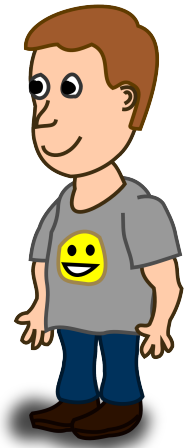


Figure: Mr. Self-Taught

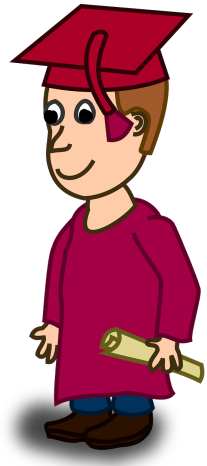
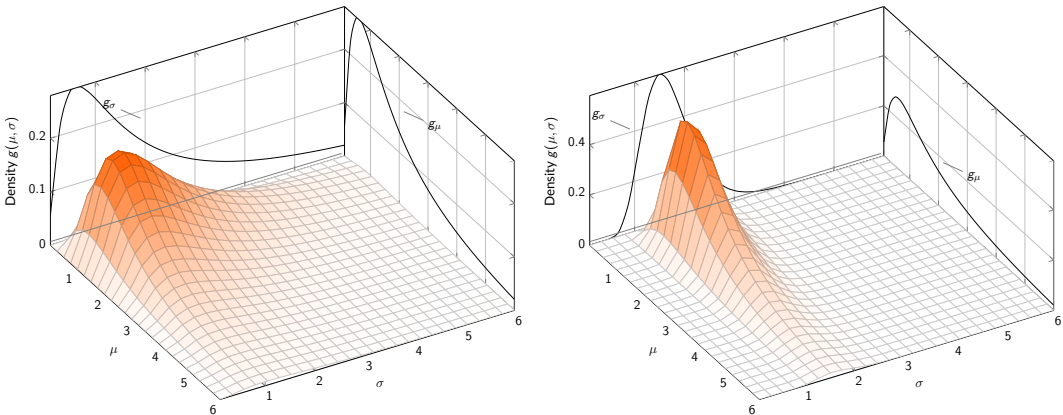


Figure: Mr. Ivy League

The Search Space



(a) High σ Heterogeneity

(b) Low σ Heterogeneity

Figure: **Lognormal Search Space Over μ, σ.**

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First-Best Benchmark

- First-best is if the firm could search directly.
- Firm cares only about expected productivity μ
- Search strategy fully characterized by reservation rule in μ as usual.
- Firm acceptance region can be written as:

$$\mathcal{D}_{FB} = \{\mu, \sigma | \mu \geq \mu^*\}$$

Recruiter Incentive Compatibility

Recruiter cares only about the probability the candidate is fired during probation period:

$$Pr(a \leq 0|\mu, \sigma) = Pr(\mu + \epsilon\sigma \leq 0|\mu, \sigma) = F_\epsilon(\frac{\mu}{\sigma})$$

We call $\frac{\mu}{\sigma}$ **standardized productivity**, $\tilde{\mu}$.

Lemma 1

In any incentive compatible contract, the set of workers the recruiter selects takes the form:

$$\mathcal{D}_R = \{\tilde{\mu}|\tilde{\mu} \geq \tilde{\mu}^*\}$$

Visualizing Indifference Curves

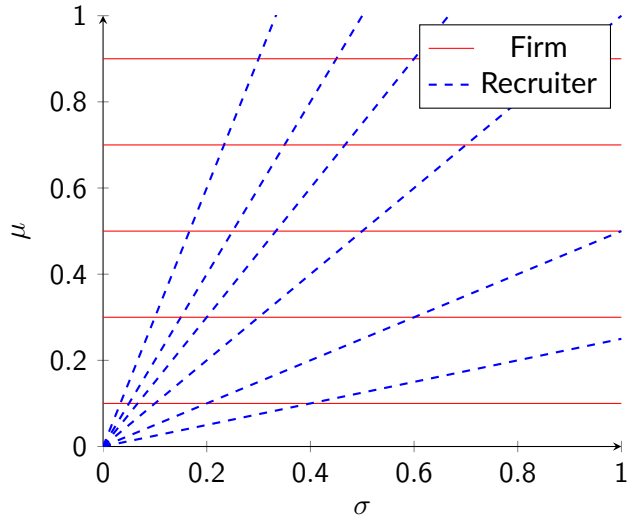


Figure: **Indifference and Isoprofit Curves Over Worker Types.**

Solving the Delegation Equilibrium

- Delegated problem is contract choice by firm then two-dimensional sequential search by recruiter.

- Main technical result of the paper:

Theorem 2

The delegated search equilibrium is given by the solution to a standard sequential search problem over $\mathbb{E}[\mu|\tilde{\mu}]$. The solution is determined by a reservation rule $\tilde{\mu}^*$, which solves:

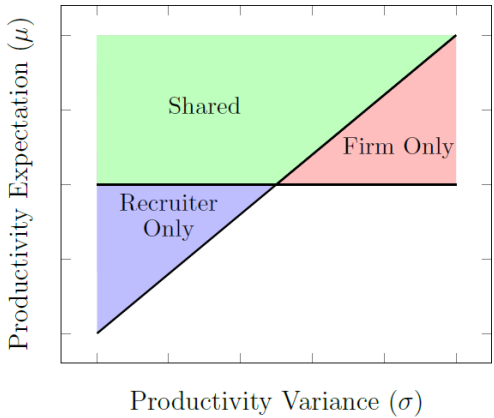
$$(\mathbb{E}[\mu|\tilde{\mu} \geq \tilde{\mu}^*] - \mathbb{E}[\mu|\tilde{\mu} = \tilde{\mu}^*]) \cdot \Pr(\tilde{\mu} \geq \tilde{\mu}^*) = c \tag{1}$$

- 2D dynamic problem boils down to a FOC in one variable, $\tilde{\mu}^*$

Economic Intuition

- First-best search is over μ.
- Delegated search is over $\mathbb{E}[\mu|\tilde{\mu}]$, a garbled/noisy version of μ.
- This inaccuracy is the **agency cost** of search.
- When $\mathbb{E}[\mu|\tilde{\mu}]$ is strict mean-preserving spread of $\mu \implies$ there is inefficiency.
- Under a slightly stronger condition, we can also say there is moral hazard: the recruiter searches too little.

Recruiter vs. Firm Acceptance Regions Over Applicant Types



Intuition: Blue are “safe-bets,” red are “diamonds in the rough.”

Multitasking

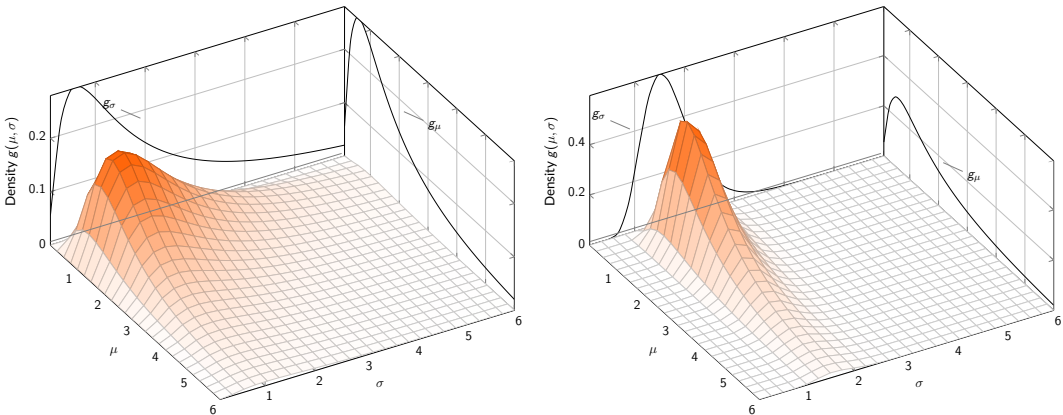
Proposition 1

As workers become more homogeneous with respect to productivity variance, agency loss decreases and recruiter search effort increases. When workers all have the same productivity variance, the first-best is achieved.

Related to the canonical Holmstrom and Milgrom (1991) multitasking models.

- Firm can only measure μ/σ.
- But search is costly and two dimensional!
- Agent spends time finding safe-bets (low variance, low expectation) workers.
- At the expense of diamonds in the rough (high variance, high expectation) workers.

Reducing Heterogeneity in Productivity Variance



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Variance-Based Statistical Discrimination

- Two worker groups: 1 and 2
- The same true productivity distribution $a \sim N(\mu_0, \sigma_0)$.
- Recruiter observes a noisy signal of productivity: $Y = a + \xi_i, \xi_i \sim N(0, \tau_i^{-2})$
- Suppose people better understand signals from their own group, and recruiter is from group 1: $\tau_1 > \tau_2$

Variance-Based Statistical Discrimination

- After observing group and signal recruiter Bayesian updates:

$$a|Y = x, i \sim N\left(\frac{\tau_i^2}{1/\sigma_0^2}x + (1 - \frac{\tau_i^2}{1/\sigma_0^2})\mu_0, \frac{\sigma_0^2\tau_i^{-2}}{\sigma_0^2 + \tau_i^{-2}}\right)$$

- This generates posterior means (μ) and variances (σ).

- For two candidates with the same expected productivity (NOT signal), recruiter prefers group 1.

Proposition 2

The probability the hired worker is from Group B is lower under delegation than the first-best. Therefore, variance-based statistical discrimination is greater under delegation than the first-best.

The Choice to Delegate

- Suppose the firm could decide to search directly or delegate.
- But search by the firm is more costly than search by the recruiter.
- Firm must weigh opportunity cost direct search vs. agency loss of delegation.
- Direct implication of prior results:

Proposition 3

As heterogeneity in productivity variance decreases, the firm is more likely to delegate. When workers are homogeneous with respect to productivity variance, the firm will always delegate.

A Vicious Cycle

Suppose we have both mechanisms...

- Initially only firms with high opportunity cost delegate.
- Assume workers get discouraged if they do not get an offer and leave the industry.
- Discouraged workers will be mainly Group B (high variance group).
- If inflow is the same as original composition, this leads to less Group B next period.
- Period two workers are more homogenous in σ.
- Agency loss of delegation declines, so more firms delegate.

Conclusion

- Provide characterization of delegated search under refund contracts.
- Show how contract form induces recruiter to inefficiently prefer low-variance candidates.
- This generates multi-tasking moral hazard and agency loss.
- Model can be used to think about how delegation amplifies variance-based statistical discrimination.