Interviews and the Assignment of Workers to Jobs

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Motivation

- Large increase in unemployment in the latest recession.
- Heterogeneity is important.
  - Differential impact across skills, occupations, and sectors.
  - ‘Mismatch’ suggested as explanation for slow recovery.
- Heterogeneity causes information frictions: types are generally hard to observe.
- How do firms and workers form matches?
- The answer to this question has many implications:
  - Employment across skill groups;
  - Wages across skill groups;
  - Incentives to create vacancies;
  - Incentives to accumulate human capital;
  - ...
Search models provide the dominant theory of unemployment.

Classic setup: agents randomly sample from a distribution at a cost.

- (Virtually) no strategic decision making: no application or recruitment decisions.
- All workers and firms participate in the same market.
- Wages and matching rates are exogenous from agent’s point of view.
Directed Search

The directed search literature (Moen, 1997) provides an alternative.
- Firms choose wages to attract workers.
- Workers observe wages and decide to which firm to apply.
- Frictions arise because of coordination problems.

In this literature, there are generally no information frictions.
- Homogeneity (Burdett et al., 2001).
- Types are observable (Shimer, 2005; Shi, 2006).
- Sorting into a separating equilibrium (Shi, 2001).

This paper: worker types are private information, which can be learned through costly interviews.
Environment

- Static model with risk-neutral agents.
- Measure 1 of workers.
- Measure $\nu$ of identical firms each with one vacancy.
- Each worker can apply to one vacancy.
- Agents cannot coordinate their actions.
- Number of applicants at a firm follows a Poisson distribution with endogenous mean $\lambda$ (queue length).
Heterogeneity in Productivity

- Workers are divided into $M$ different types, $m = 1, \ldots, M$.
- Firms are divided into $N$ different types, $n = 1, \ldots, N$.
- Worker types are private information.
- Application decision may reveal information about workers’ types.
- Alternatively, firm can learn an applicant’s type by screening or interviewing him. Each interview (except the first) costs $k$.
- Match between a firm of type $n$ and a worker of type $m$ creates $x_{m,n}$ units of output. Unmatched firms and workers produce 0.
# Planner's Problem

1. **Allocate workers to firms**
   - Positive / negative assortative matching.
   - Pooling / separating worker types.
   - Queue length $\lambda_{m,n}$.
   - $L_{m,n} = \sum_{m'}^{M} \lambda_{m',n}$ as the queue of applicants at least as good as $m$.

2. **Provide screening instructions to each firm**
   - Balance trade-off: as more workers are being interviewed,
     - (+) the expected match quality increases.
     - (−) the incurred screening cost increases.
Lemma
Optimal screening policy is sequential: interview workers until one is found whose productivity equals/exceeds a certain cutoff $\mu$.

Lemma
Optimal cutoff is independent of the number of applicants and the interview round, and equals the lowest $\mu_n$ such that

$$k > \chi^M \frac{\lambda \mu', n}{L_{1,n}} \cdot x_{\mu', n} - x_{\mu_n, n}.$$
**Optimal Queue Lengths**

- Choice of queue lengths is not trivial.
  - Complementarities provide an incentive for PAM.
  - High type workers and firms should both match with large probability.
- If $k$ is sufficiently small, some low type workers should apply to high type firms (‘pooling’).
- If $k$ is large, the low type applicants will crowd out higher types, and separating types might be preferable.
Planner’s Solution

Proposition
A solution to the planner’s problem exists.

Lemma
Firms receive applications from only one type $m \geq \mu$. Hence, firms hire the best type of worker that applies.

Lemma
There is pooling of multiple worker types for sufficiently small $k$, and full separation of worker types for sufficiently large $k$. 
Planner’s solution can be decentralized through a process of directed search.

Upon entry, each firm posts and commits to a contract. Contract consist of a wage schedule $\{w_{m,n}\}$ and a hiring policy $\mu_n$.

Workers observe all posted contracts before deciding to which firm to apply.

Workers’ application decisions endogenously determine the queue lengths.

**Proposition**

A market equilibrium exists and it is efficient.
Conclusion

- Model to study how information frictions influence labor market outcomes.
- Worker productivity is private information.
- Firms can learn the type of a worker through a costly interview.
- Alternatively, firms can try to induce sorting and type revelation through the contracts that they post.
- The market equilibrium is efficient.
- Pooling of worker types for sufficiently small screening cost.
- Separation of worker types for sufficiently large screening cost.