

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;
 - ...

Random Search

- 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 v 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 λ (queue length).

Heterogeneity in Productivity

- Workers are divided into M different types, $m = 1, \dots, M$.
- Firms are divided into N different types, $n = 1, \dots, N$.
- 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 $\lambda_{m,n}$.
 - $L_{m,n} = \sum_{m'=m}^M \lambda_{m',n}$ 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.

Optimality Screening Policy

Lemma

Optimal screening policy is sequential: interview workers until one is found whose productivity equals/exceeds a certain cutoff μ .

Lemma

Optimal cutoff is independent of the number of applicants and the interview round, and equals the lowest μ_n such that

$$k > \sum_{m'=\mu_n+1}^M \frac{\lambda_{m',n}}{L_{1,n}} x_{m',n} - x_{\mu_n,n} .$$

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 μ . 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 .

Decentralization

- 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 $f_{w_m, n}g$ and a hiring policy μ_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.