

A Discussion on  
On Worker and Firm Heterogeneity in Wages and  
Employment Mobility: Evidence from Danish  
Register Data

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## Research Questions

- Is there positive assortative matching in labor markets?
- How do wages depend on worker and firm unobserved heterogeneity?
- What are the mechanisms behind sorting in labor markets?

## Data

- The matched employer-employee data from Denmark between 1987 and 2013
- Annual wages data & weekly mobility data

- There exists positive assortative matching in the Danish labor market
- Factors contributing to wage difference across workers
 

30% Worker	5% Firm
4% Observed characteristics	6% Match-specific
7% Sorting	52% Residual
- Sorting happens early in a worker's career; job mobility maintains the level of sorting

## Technical

- Adopt the finite mixture approach of Bonhomme, Lamadon, and Manresa (2017)
- Develop a Classification Expectation Maximization (CEM) algorithm for estimating the finite mixture model

## Empirical

- Provide an insight on the mechanisms behind sorting

## Specification

- Transition probabilities

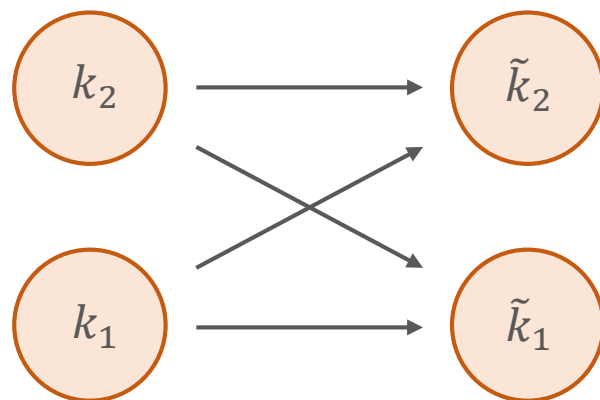
$$M(l'|k, l, x) = \underbrace{\lambda_k(x)}_{\text{Search intensity}} \underbrace{v_{l'}(x)}_{\text{New firms distribution}} \underbrace{P_{kll'}(x)}_{\text{Prob. of accepting an offer}}$$

where

$$P_{kll'}(x) = \frac{\gamma_{kl'}(x)}{\gamma_{kl}(x) + \gamma_{kl'}(x)}$$

## Specification

- Relax the “alternating cycle” assumption in BLM



- But at the same time ...

- Conditional independence assumption

$$P(w_t, l_{t+1} | z, k, \mathbf{l}_t, \mathbf{w}_{t-1}, \mathbf{x}_t) = P(w_t | k, l_t, x_t) P(l_{t+1} | k, l_t, x_t)$$

- Is this assumption satisfied in the data?
- The answer is likely to be **NO!** (Bonhomme, Lamadon, and Manresa, 2017)
- In comparison, BLM assume

*Serial independence assumption (dynamic model)*

$$P(w_t | k, l_t, l_{t-1}, l_{t-2}, x_t, x_{t-1}, w_{t-1}, w_{t-2}) = P(w_t | k, l_t, l_{t-1}, x_t, w_{t-1})$$

- Unemployment spell – a solution? (Borovickova and Shimer, 2018)
- A worker's wages at the same firm are likely to be correlated
- According to the job ladder model (Burdett and Mortensen, 1998), a worker's wages at different firms within the same employment spell are also likely to be correlated
- Borovickova and Shimer (2018) suggest
  - (i) using the average wages for each worker-firm match, or
  - (ii) using wages from different employment spells



- How does the conditional independence assumption affect the model's prediction?
  - Mean reversion in wages
  - Small sorting effect for experienced workers
  - Little variation in mean wages across firm types