Monopsony in Movers: The Elasticity of Labor Supply to Firm Wage Policies

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CES/Census Presentation

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Monopsony on the move

- Monopsony is everywhere!
  - **Quasi-experimental**: Caldwell and Oehlsen (2018), Cho (2018), Kroft et al. (2020), Dube, Manning and Naidu (2019)
  - **Concentration**: Azar, Marinescu, Steinbaum (2017), Rinz (2018), Arnold (2019), Prager and Schmitt (2019)
  - **Observational** (separations): Webber (2015, 2018), Bachmann, Demir Frings (2018)
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- Some **outstanding questions**:
  - Has monopsony power really changed over time?
  - Is monopsony mostly non-competes and concentration (newly re-discovered)?

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  - **How can we measure monopsony power?**

Measuring monopsony power

- A key approach since Card and Krueger (1996), Manning (2003): separations elasticity

- Dynamic monopsony:
  - $L_t(w) = R_t(w) - S_t(w)$
  - TLAD: $\epsilon = \gamma - \eta$
  - Manning further shows that with constant elasticities, in steady state, $\gamma = -\eta$, and so $\epsilon = -2\eta$

- The separations elasticity (η) is a key proximate measure of labor market power!

Example from retail labor market

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- But in 2020, Target's minimum is \$15, while Walmart's is still \$11.
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  - this is the key mesure of labor market power, η, were $2\eta = \epsilon$

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- Wage markdown under monopsony:
  - $w = \left(\frac{\epsilon}{1+\epsilon}\right) \times MRPL$

Problems with existing estimates

- Source of wage variation - idosyncratic wage change, skills, pay premia/penalty at a firm
- Lack of hours (earnings versus wage)
- Problem of attenuation
- Estimates << newer quasi-exp estimates (internal/external validity?)

Proposed approach

- Key idea:
  - isolate firm component of wages (firm wage policies)
  - estimate separation response to this component of wages
  - use of all wage variation likely to attenuate separation elasticity and overstate monopsony

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- Two approaches to measuring firm component of wages:
  - **AKM**. Advantage: simple, well known. Disadvantage: inability to account for worker sorting, match effects, heterogeneous elasticities by worker types
  - **Matched event study**: allows sorting, heterogeneous elasticities, match effects.

Key Findings

- Separation elasticity of around -2. Firm labor supply elasticity of around 4 is:
  - pro-cyclical
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Key Findings

- Separation elasticity of around -2. Firm labor supply elasticity of around 4 is:
  - pro-cyclical
  - lower for low-wage workers
  - mostly unrelated to concentration measures
- Moderate monopsony power, less than "traditional approach"
- AKM estimates are broadly similiar; however, fail a number of falsification tests.

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Data description

- Matched employer-employee data from Oregon (2000-2017)
  - near universe of all workers
  - advantage: hours!
- Focus on workers in firms >20 workers
  - reduced measurement errors for estimating AKM effects
- Exclude very low earnings workers (<$2/hr, <3quarter spells, <100)

Descriptive Statistics

	Workers *(millions)*	**Firms**	**Earnings** *(annual)*	**Separations** *(quarterly)*
Full panel: 2000-2017				
All	5.3	316,910	27,169	16.6%
Hours>100	4.7	302,541	29,636	12.1%
Spell>2q	3.7	249,034	32,057	7.6%
Private large	3.4	54,663	44,103	7.7%
By period				
2000-2005	2.1	31,429	42,147	8.1%
2006-2011	2.1	31,788	44,975	7.5%
2012-2017	2.2	32,913	45,023	7.6%

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A simple model of dynamic monopsony 1

- Productivity of worker i at firm j: $y_{ij} = A_i p_j$
- Workers transition from $j \to j'$ with $Pr(f_{ij't+1}|f_{ijt})$, so $s_{ijt} \equiv 1 - Pr(f_{ijt+1}|f_{ijt})$ is separations rate

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- Steady state:

$$\underbrace{\sum_{j' \neq j} Pr(f_{ij}|f_{ij'})Pr(f_{ij'})}_{R_{ij}} = \underbrace{Pr(f_{ij})}_{q_{ij}}\underbrace{(1 - Pr(f_{ij}|f_{ij}))}_{s_{ij}}$$

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- Monopsonist maximizes $\sum_i q_{ij}(A_i p_j - W_{ij})$ subject to $q_{ij} = \frac{R_{ij}(W_{ij})}{s_{ij}(W_{ij})}$.
  - inverse labor suppply elasticity $\frac{dw_{ij}}{dlog(q_{ij})} = \frac{1}{\epsilon_j}$ (where $w = \log(W)$)
  - equilibrium $w_{ij} = \alpha_i + \phi_j$, where $\alpha_i \equiv log(A_i)$ is portable component, while $\phi_j \equiv log(\beta_j p_j)$ is the firm-specific component of the wage that is chosen by firms, with a markdown of $\beta_j = \frac{\epsilon_j}{1+\epsilon_j}$.

A simple model of dynamic monopsony 2

- Assumption: Labor supply is solely a function of ϕ_j and $\frac{dw_{ij}}{dlog(q_{ij})} = \frac{d\phi_j}{dlog(q_{ij})}$.
- By steady-state assumption, $\frac{d\phi_j}{dlog(q_{ij})} = \frac{1}{\gamma(\phi_j) - \eta(\phi_j)}$, where $\gamma(\phi_j)$ and $\eta(\phi_j)$ are the recruitment and separation elasticities
- The labor supply elasticity facing the firm is given by $\epsilon(\phi_j) = \gamma(\phi_j) - \eta(\phi_j)$

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- If γ, η constant they are equal, and $\epsilon = -2\eta$; generally average recruitment and separations elasticities equal for some weights (Manning, 2003).
  - Note $y_{ij} = A_i p_j$ rules out match effects and complementarities, and imposes constant markdown across workers; consistent with AKM but we generalize this later.

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  - Note $y_{ij} = A_i p_j$ rules out match effects and complementarities, and imposes constant markdown across workers; consistent with AKM but we generalize this later.
- One can additionally allow for recruitment from non-employment: $\epsilon = -(1 + \theta_R)\eta^{EE} - (1 - \theta_R)\eta^{EN} - \gamma_\theta^{EE}$

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Connecting monopsony to a model of earnings: AKM

- AKM earnings model: $w_{ijt} = \sum_j \phi_j f_{ijt} + \alpha_i + \alpha_t + \epsilon_{ijt}$
- Assignment needed for identification of AKM model (CHK):
  $f_{ijt} = E(\mathbf{J_{it}} = j) = E(\mathbf{J_{it}} = j|\epsilon) = G_{jt}(\phi_1, ..., \phi_J, \alpha_i)$
- If we want to estimate η by causally interpreting the coefficient from a regression of separations on $\hat{\phi}_j$ need additional assumption:
  - $G_{jt}(\phi_1, ..., \phi_J, \alpha_i) = \epsilon(\phi_j, \{\phi_{j'}\}_{j \neq j}) + h(\alpha_i, \{\phi_{j'}\}_{j \neq j})$
  - rules out sorting.

Estimation of AKM based model

- AKM estimate of $\hat{\phi}_j$is a generated regressor, and variance may be overstated due to limited mobility bias (Bonhomme, Lamadon, Manresa 2019).
- Solution: sample splitting
  - estimate $\hat{\phi}_j^A$and $\hat{\phi}_j^B$ in 6 year periods
  - regress s_{ijt} on $\hat{\phi}_j^A$ while instrumenting the latter with $\hat{\phi}_j^B$

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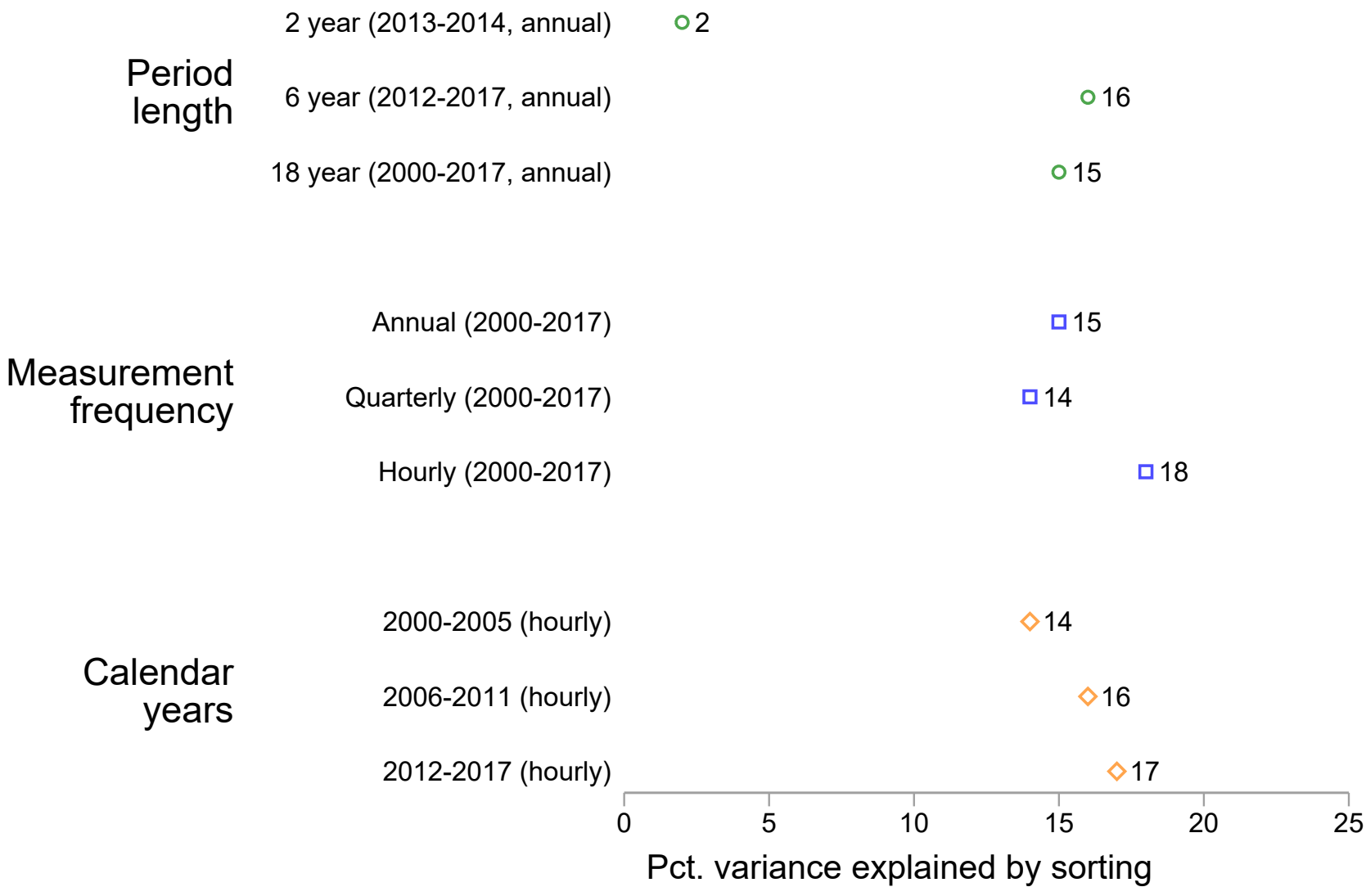
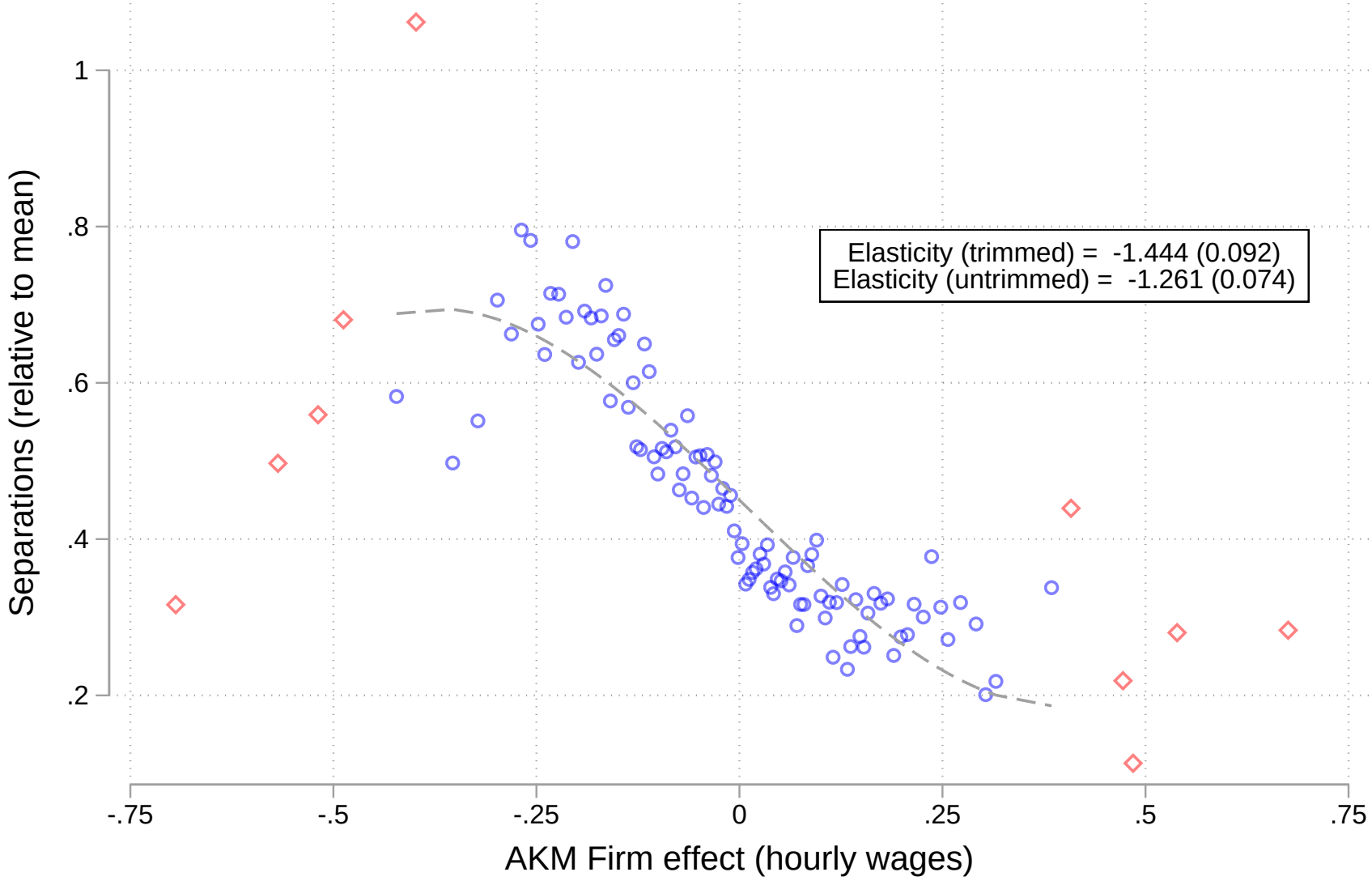
- Method 1 (calculate LSE): 2 times sep elasticity
- Method 2 (calculate LSE): accounting for hires out of non-emp (also estimate elasticity of share of recruits out of non-emloyment)

Baseline AKM decompositions – Firm Fixed Effects

Baseline AKM decompositions – Sorting



Firm effect and separations

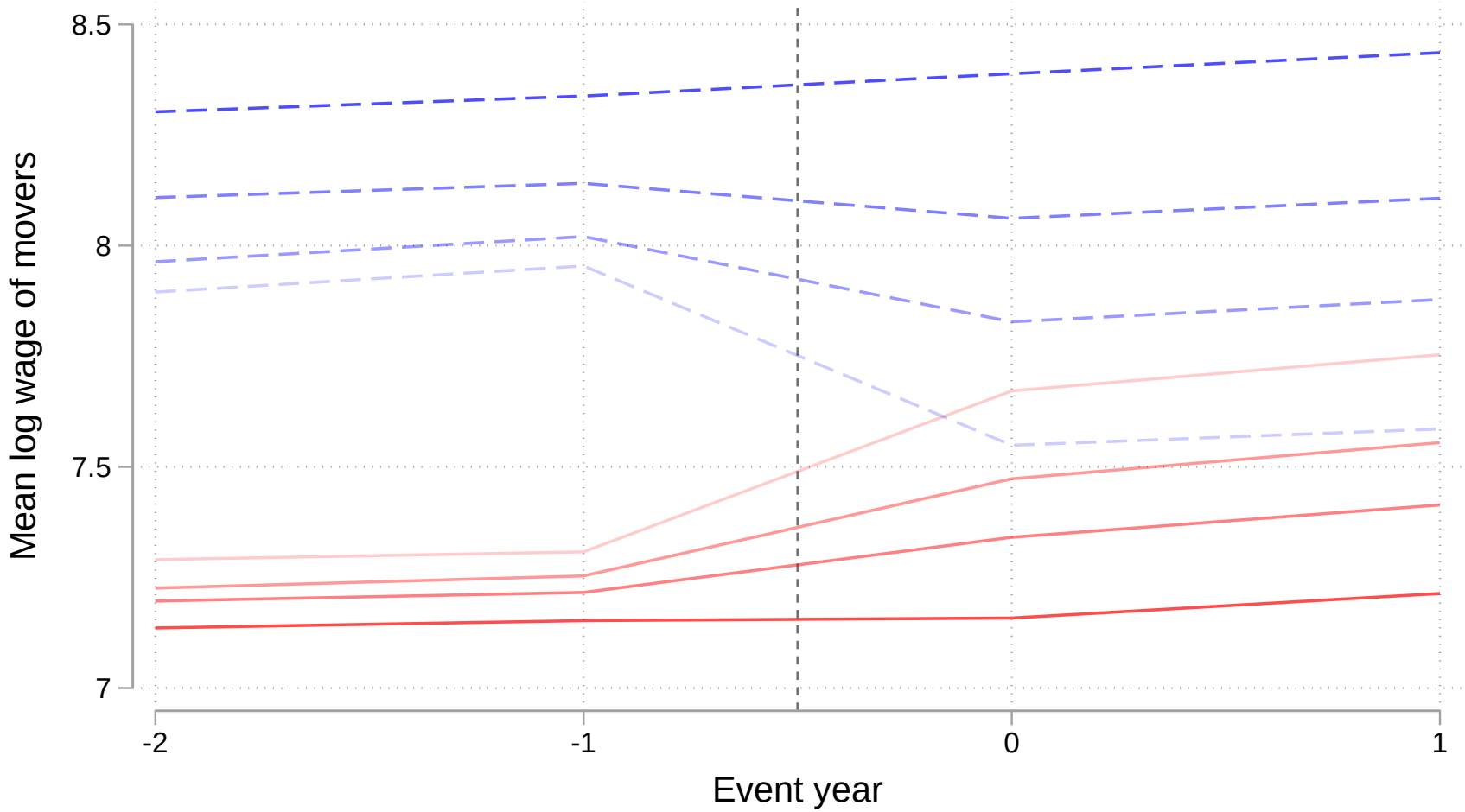


Separations and labor supply elasticities

All Seps elasticity	-1.448	(0.095)
EE Seps elasticity	-1.811	(0.141)
E-N seps elasticity	-1.303	(0.085)
EE recruit share elasticity	0.438	(0.064)
Pct EE-recruits	0.465	
Labor Supply Elasticity	**2.912**	**(0.221)**

Testing assumptions behind AKM based approach

- AKM may be wrong (e.g., match effects)
- Test 1: symmetry of wage gains - **passes**



Testing assumptions behind AKM based approach 2

- AKM may be wrong (e.g., match effects)
- Test 1: symmetry of wage gains - **passes**

Testing the assumptions behind AKM based approach 3

- AKM may be wrong (e.g., match effects)
- Test 2: match residuals uncorrelated with direction of future move - **fails**

	Future Firm FE		**Positive change**	
	(1)	(2)	(3)	(4)
Match effect	0.058	0.058	0.156	0.158
	(0.003)	(0.003)	(0.007)	(0.006)
Firm effect	0.513	0.43	-1.045	-1.202
	(0.011)	(0.011)	(0.029)	(0.031)
Obs (millions)	1.6	1.5	1.6	1.5
Controls		Y		Y

Testing the assumptions behind AKM based approach 4

- Even if AKM right for wages, sorting biases separation elasticity estimate

	(1)	(2)	
	Firm	Firm	Worker
Separations	-1.342	-0.739	-0.641
	(0.085)	(0.078)	(0.016)
Labor Supply Elasticity	2.69	1.38	1.496
	(0.199)	(0.185)	(0.038)

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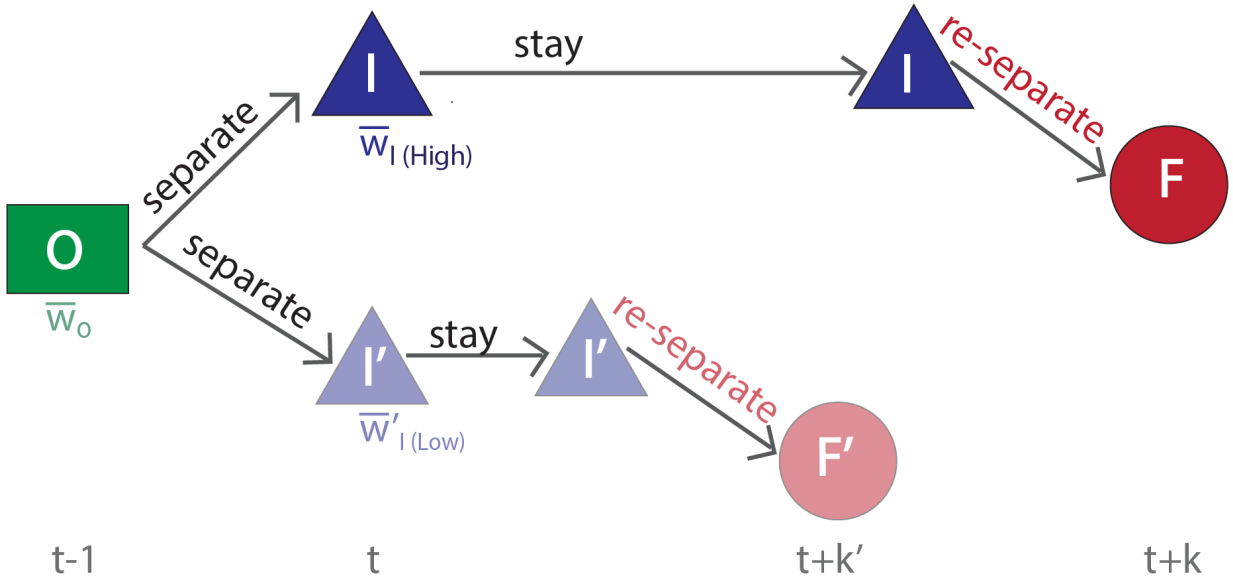
Alternative approach: matched event study

- Assignment rule (conditional on past matches):
  $f_{ijt} = G_{jt}(\{\bar{w}_k\}, \{w_{ir}, f_{ik'r}\}_{r<t})$
  - can additionally condition on $\hat{\alpha}_i$
  - allows for sorting
- Earnings equation: $w_{ijt} = \sum_j \phi_j \bar{w}_j f_{ijt} + \underbrace{L(\{w_{ir}, f_{ik'r}\}_{r<t})}_{L(History_{i,t})} + \epsilon_{ijt}$
- For movers at time t:
  - $w_{ijt} - w_{ijt-1} = \tilde{\phi}(\bar{w}_j - \bar{w}_{j'})(f^i_{jt} - f^i_{j't-1}) + L(history_{i,t}) + \nu_{ijt}$
  - $s_{it+k} = \eta \Delta w_{ijt} + L(history_{i,t}) + \epsilon_{ijt+k}$

Matched event study design



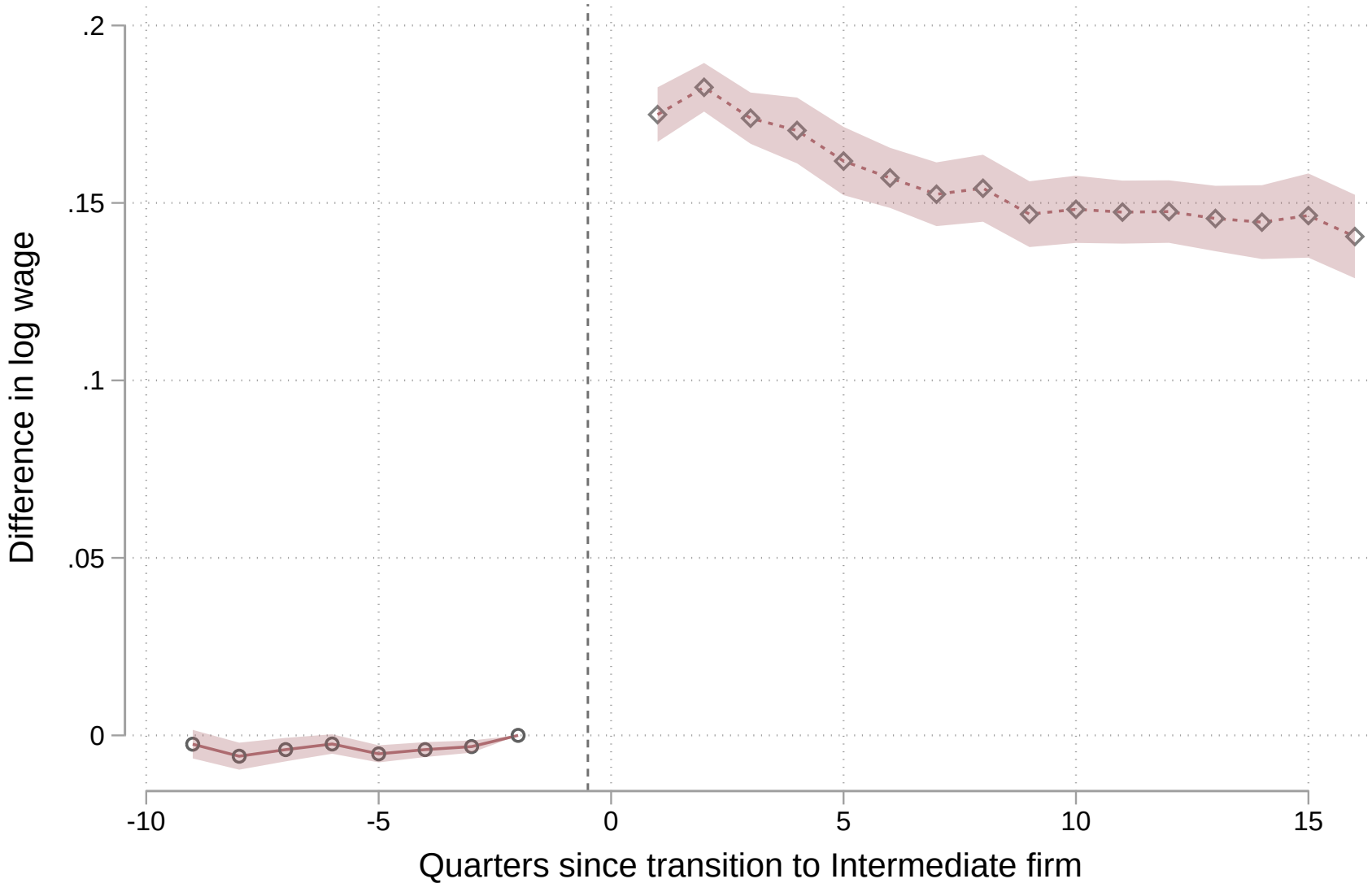
First Stage:

$$w_{i,I(i),t} - w_{i,O(i),t-1} = \phi(\bar{w}_{i,I(i),t} - \bar{w}_{i,O(i),t-1}) + L(History_{i,t,d}) + \epsilon_{i,t}$$

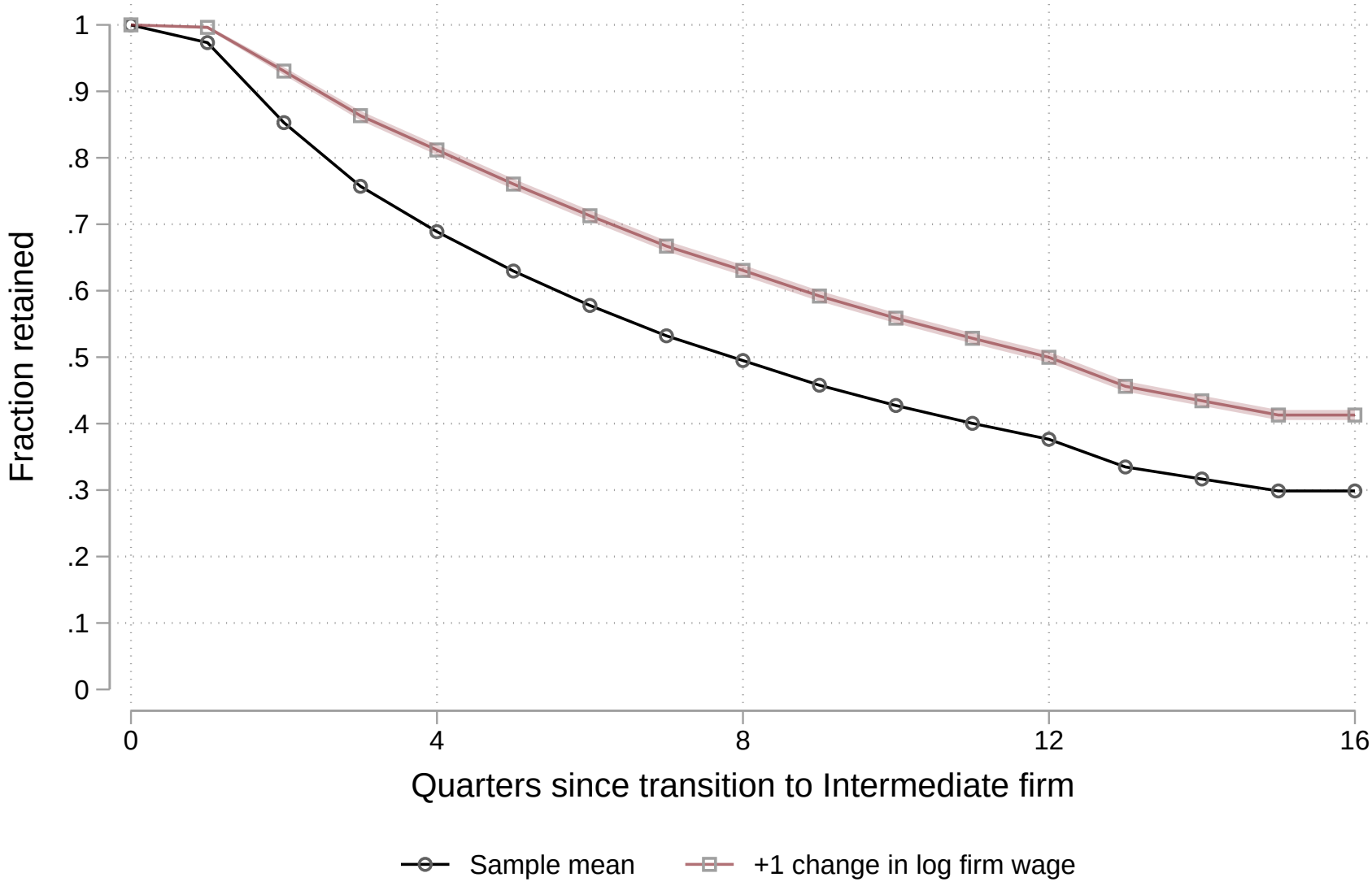
Reduced Form:

$$s^{I}_{i,t+k} = \delta(\bar{w}_{i,I(i),t} - \bar{w}_{i,O(i),t-1}) + L(History_{i,t,d}) \times \mathbf{1}_{t+k} + \epsilon_{i,t+k}$$

Matched event study - wage effects



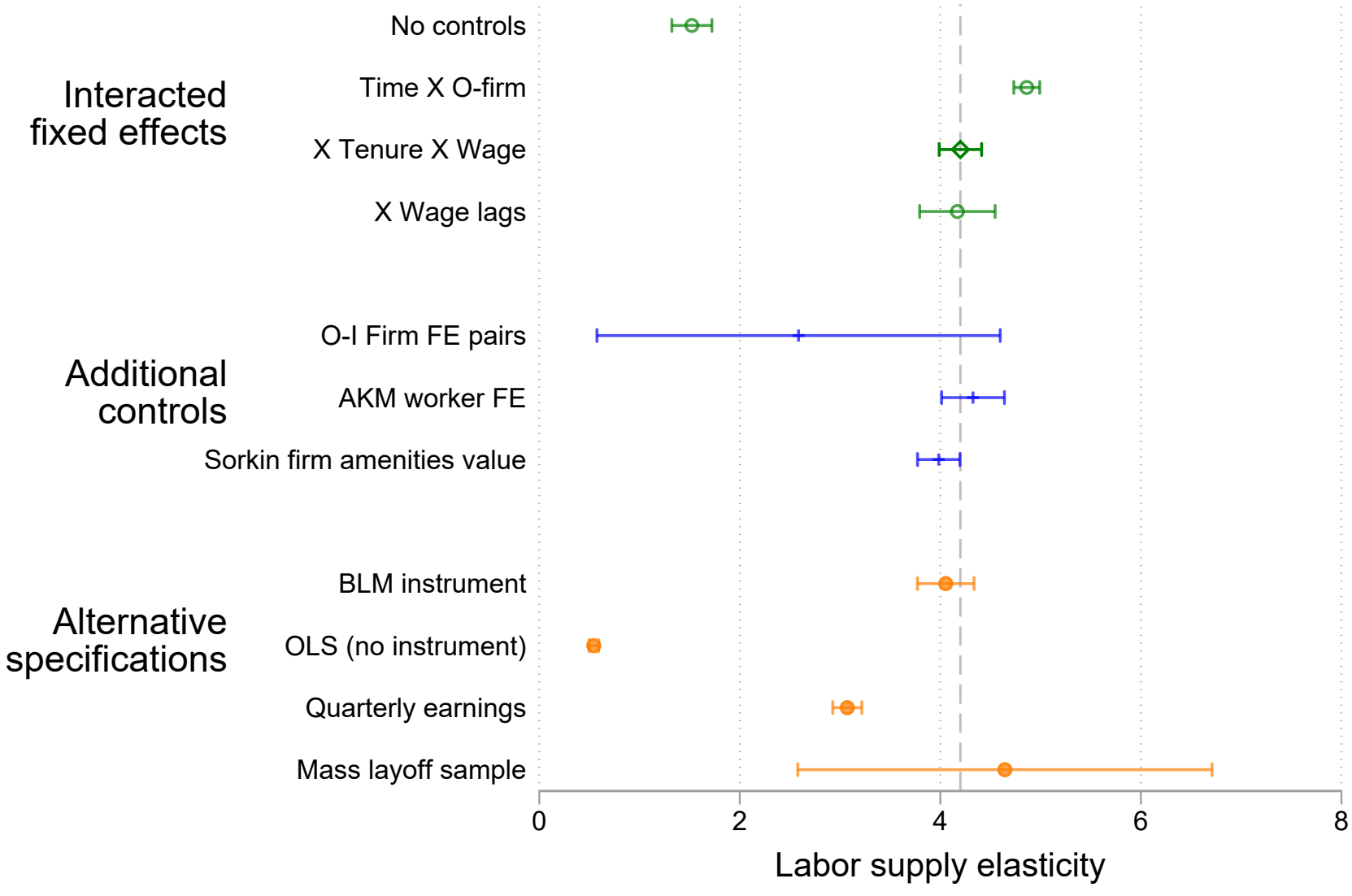
Matched event study - Reduced Form (Retention)



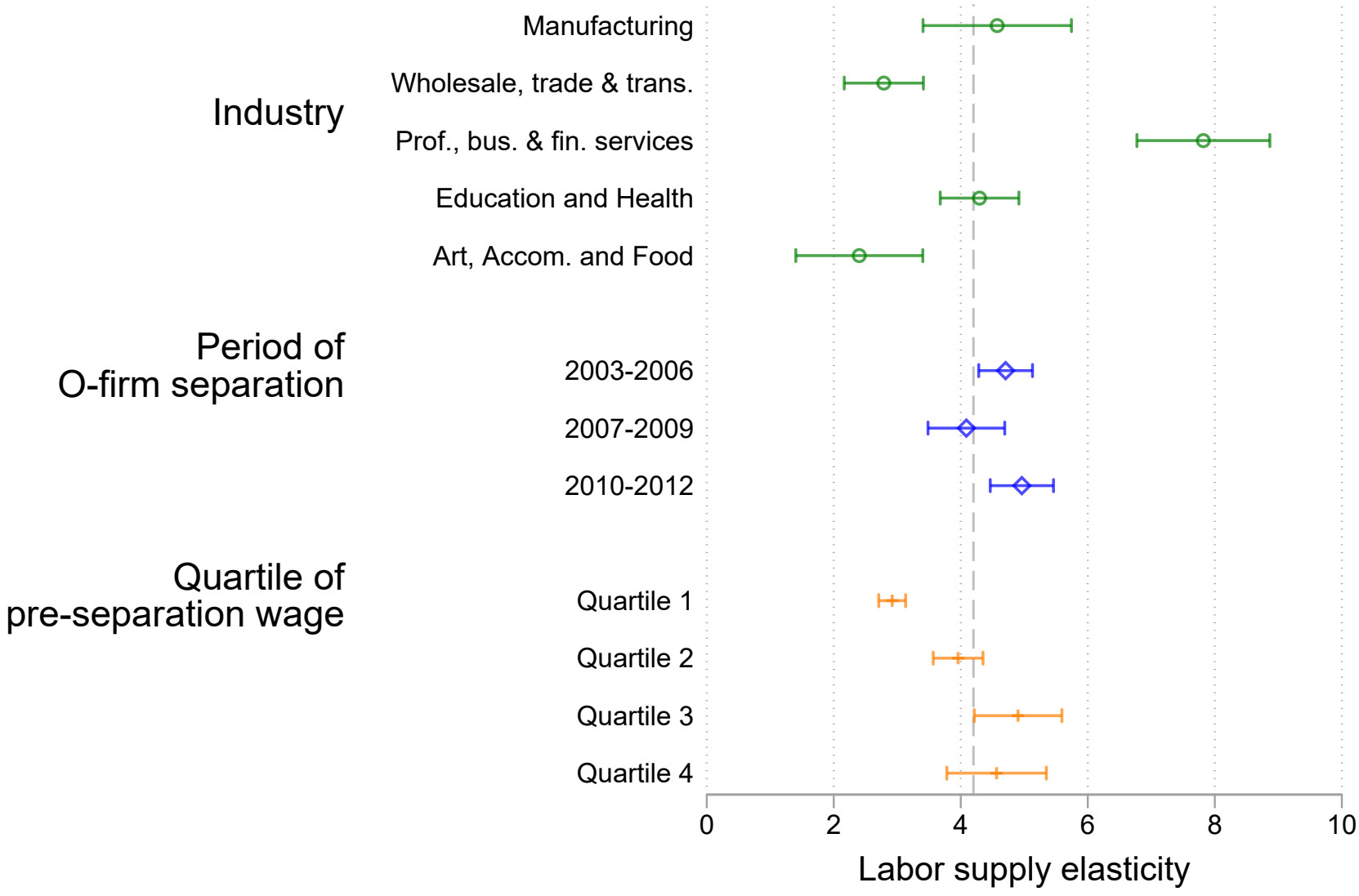
Matched event study - main findings

First stage:	
Own wage on firm wage	0.176
	(0.004)
IV estimate:	
Separations elasticity	-2.1
	(0.054)
Labor supply elasticity	4.2
	(0.108)

Matched event study - robustness

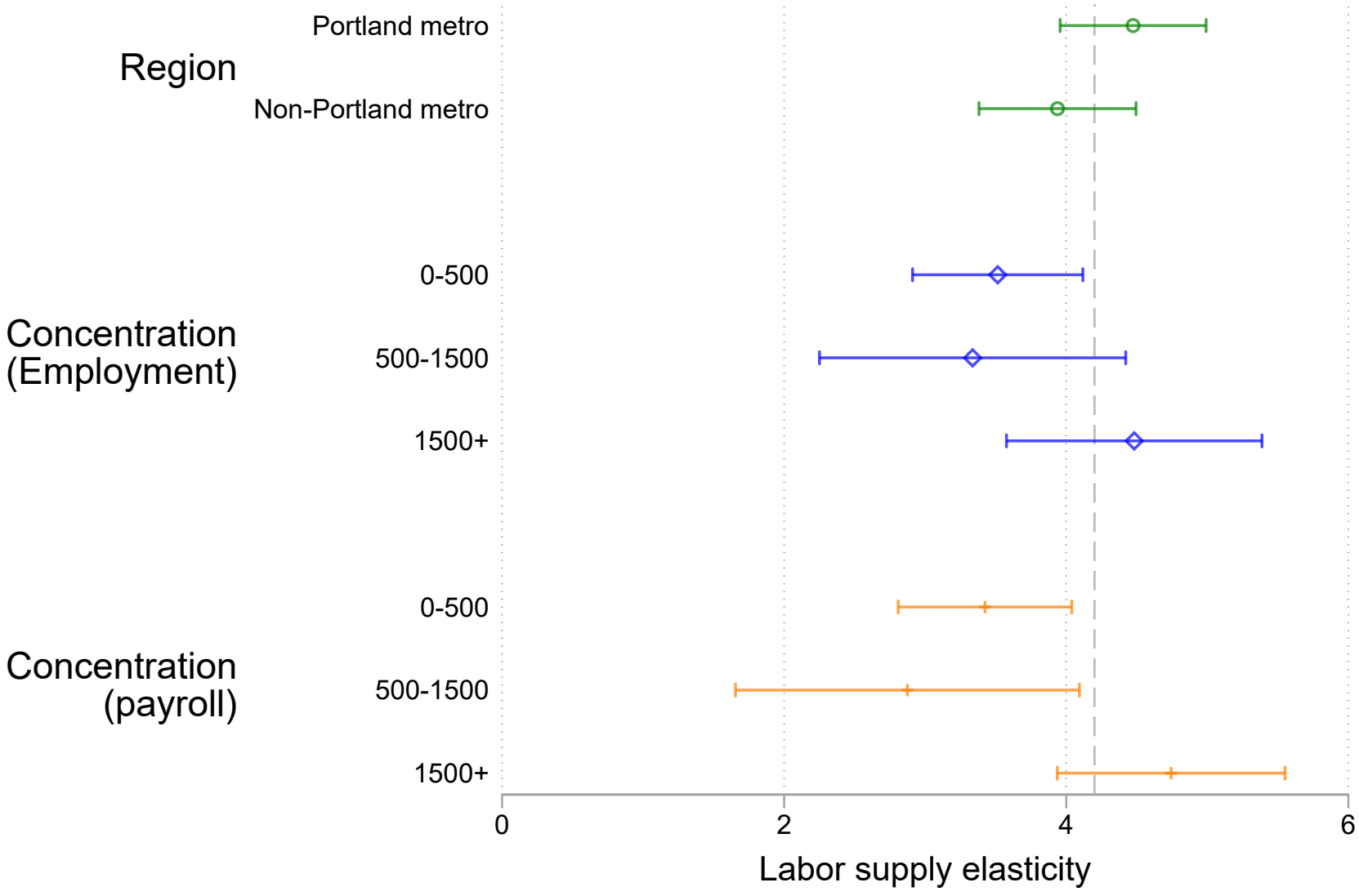


Heterogeneity



Monopsony power, and firm component of wages

Over-concentration on concentration?



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Conclusions

- Monopsony is pervasive
  - moderate sized LS elasticites (around 3-4) consistent with new quasi-exp literature
  - **contrary to received wisdom**: not very different in "concentrated" versus "not-concentrated" segments
- However, mis-measuring firm wage policies can suggest implausibly high monopsony power
- Monopsony power is high in low-wage industries and for low-wage workers
  - **contary to received wisdom**: high turnover in a low-wage industry doesn't imply it's a fluid, competitive, market.