Internal and External Labor Markets and Declining Dynamism

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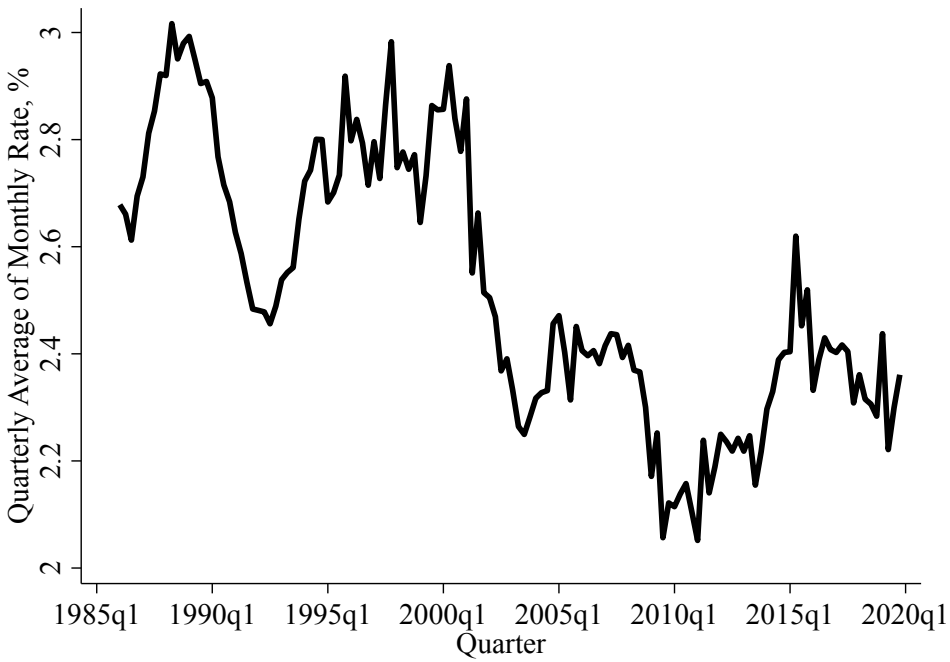
Background

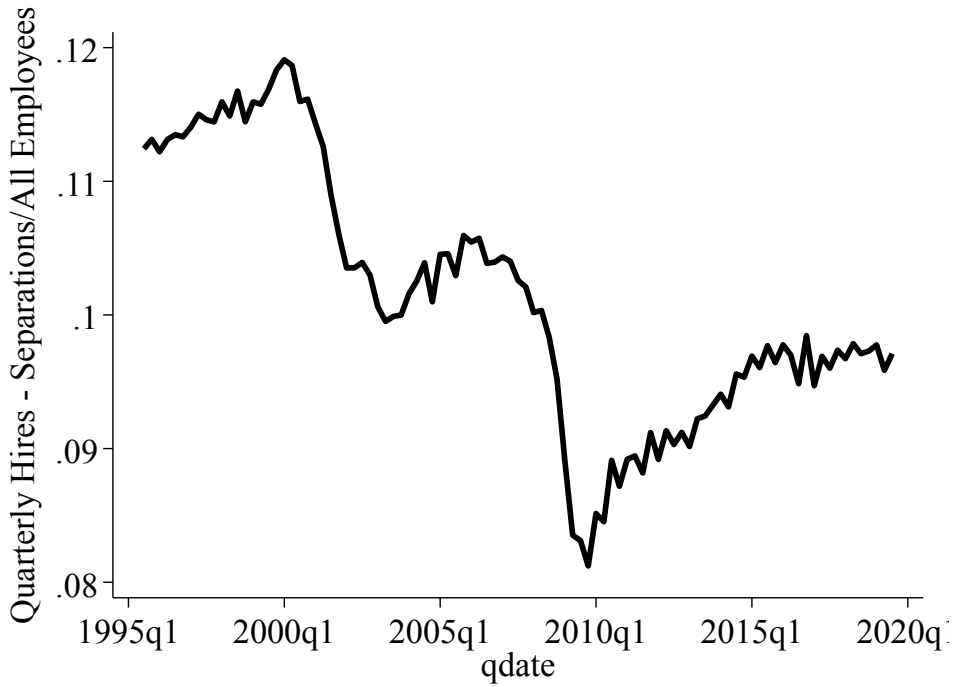
1. Declining employer-to-employer transitions rate and labor reallocation rates across firms

Declining Labor Market Dynamism

Employer-to-Employer Transitions Rate



Worker Turnover Rate



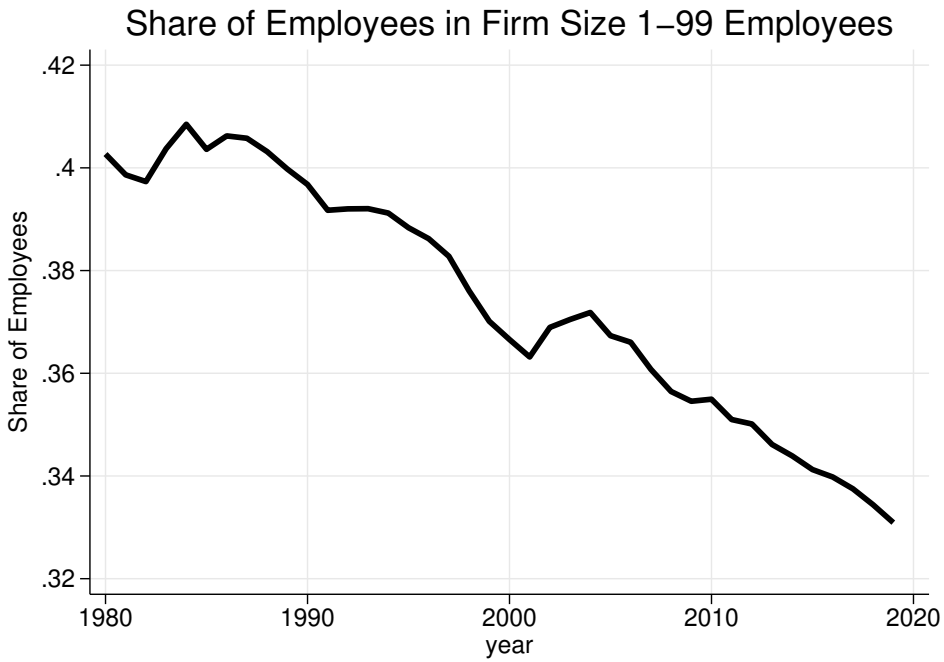
Source: Current Population Survey (Fujita, Moscarini and Postel-Vinay, 2022) and Quarterly Workforce Indicators

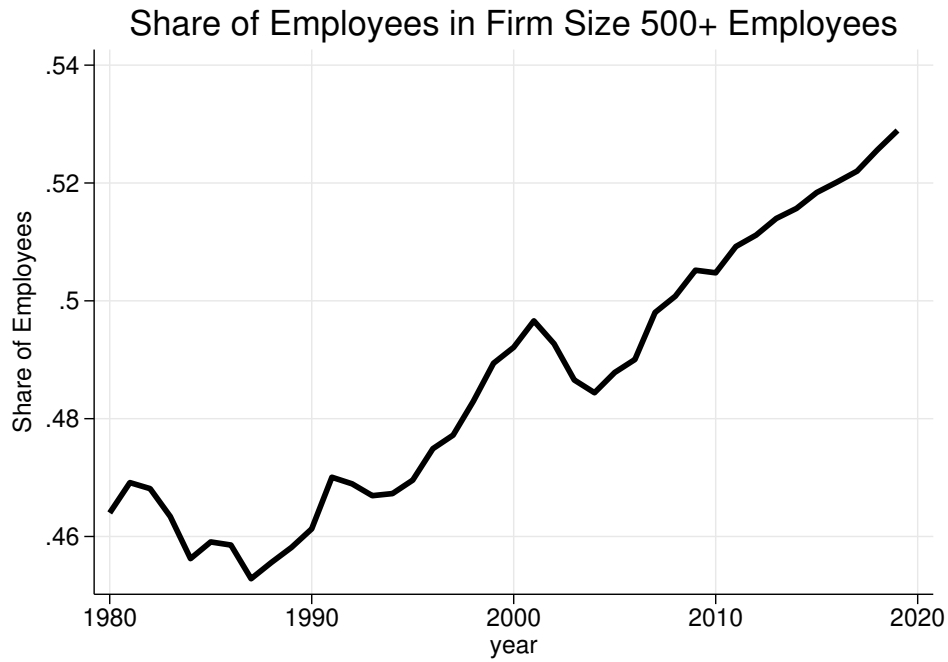
Background

1. Declining employer-to-employer transitions rate and labor reallocation rates across firms

2. Employment composition has shifted towards large firms

Shifting Worker Composition towards Large Firms





Source: Business Dynamics Statistics

Background

1. Declining employer-to-employer transitions rate and labor reallocation rates across firms
2. Employment composition has shifted towards large firms
3. Large firms have internal job ladders

Evidence of Internal Job Ladder in Large Firms

Show that job stayers in large firms realize:

- Increased likelihood of occupational switching
- Higher wage growth
- Higher wage growth, conditional on occupational switching
- Lower separation risk

Background

1. Declining employer-to-employer transitions rate and labor reallocation rates across firms
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To what extent can accounting for *internal* labor market transitions offset or amplify the decline in *external* labor market dynamism?

Outline

1. Evidence of Internal Job Ladders in Large Firms
2. Evolution of Internal Job Ladders
3. Decomposing True Dynamism to Internal and External Job Moves

Internal Job Ladders in Large Firms

Measuring Within-Firm Mobility of Job Stayers

- Need: Wages and occupations of job stayers at different firm sizes
- Data: CPS Basic Monthly Survey

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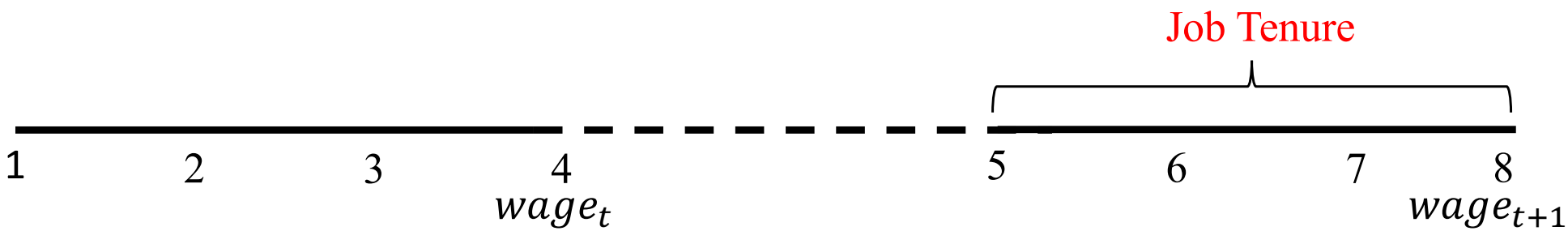

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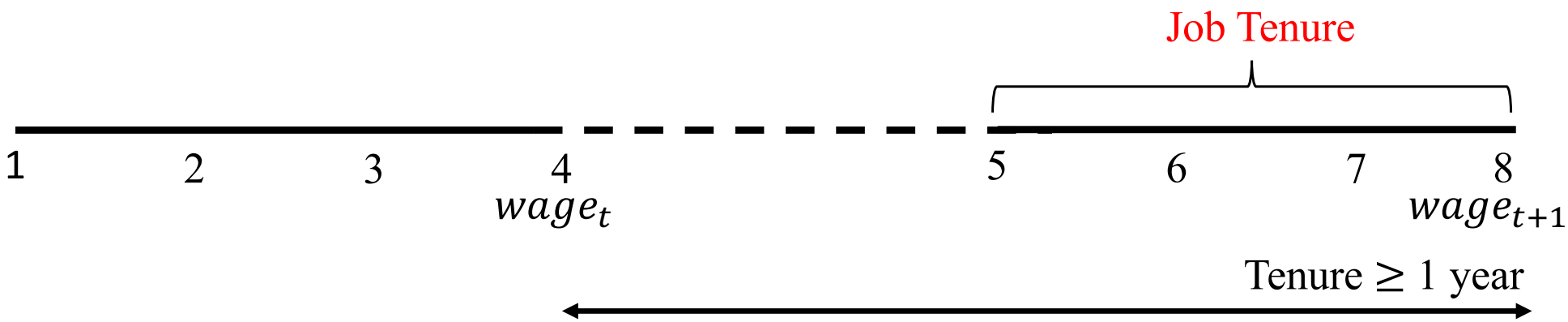

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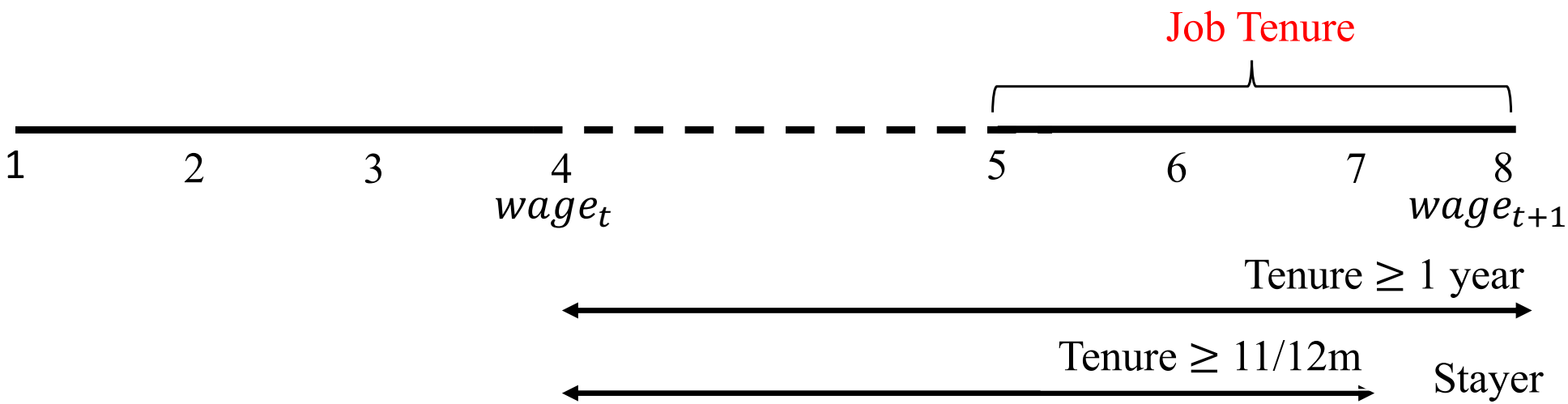

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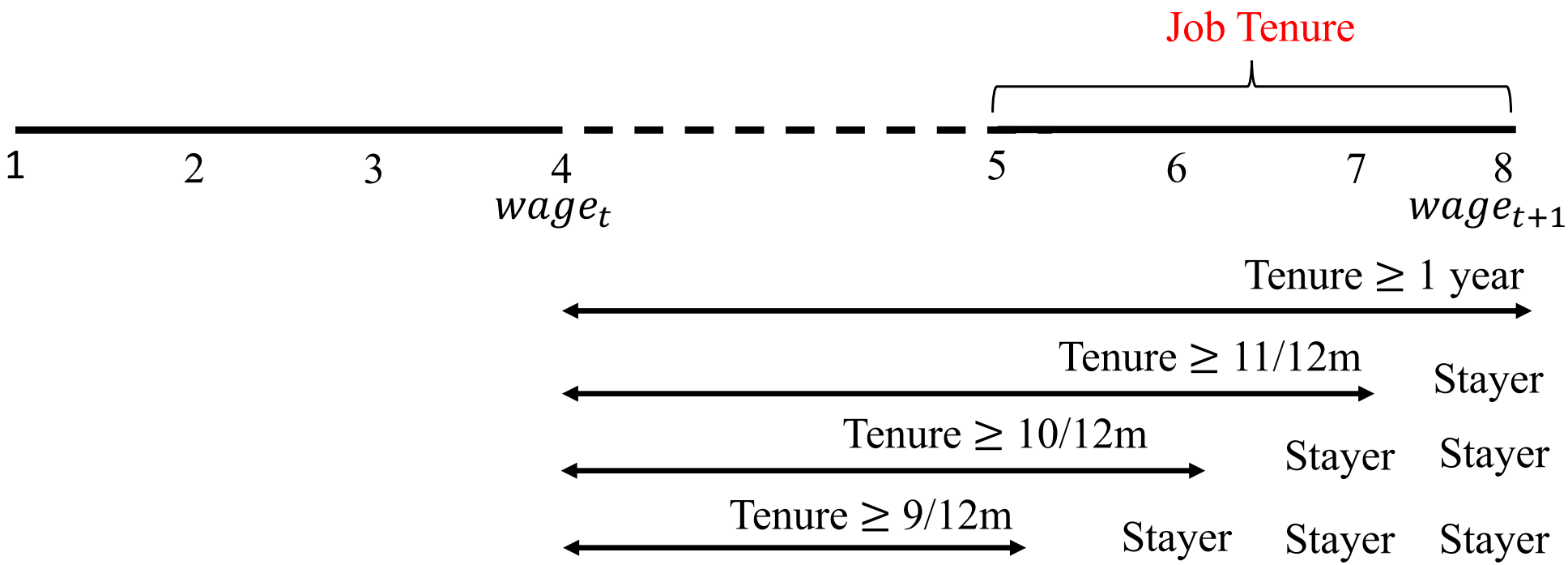
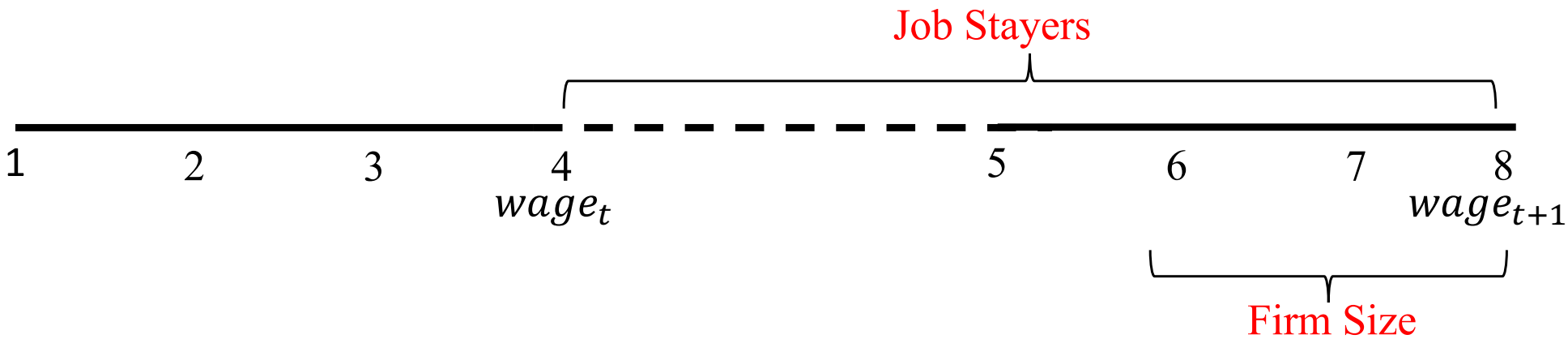


Measuring Within-Firm Mobility of Job Stayers

- Need: Wages and occupations of job stayers at different firm sizes
- Data: CPS Basic Monthly Survey
  - Job Tenure & Occupational Mobility Supplement (Jan/Feb, biennial)
  - Annual Social and Economic Supplement (March)



Sample

- Period: Biennial, 1998 - 2020.
- Individuals: Full-time, privately employed with tenure $\geq$ 1 year.
- Sample size:
  - Job Stayer $\cap$ Firm Size $\approx$ 120,000 individuals
  - Job Stayer $\cap$ Firm Size $\cap$ Wage Growth $\approx$ 25,000 individuals
  - Job Stayer $\cap$ Firm Size $\cap$ Wage Growth $\cap$ Occupation Transition $\approx$ 1200 individuals
- Controls:
  - age, age^2, log tenure, hours, married, male, marriedmale, three education categories, three race categories, whether Hispanic, whether paid hourly, state, unemployment rate.

Higher Earnings Growth in Large Firms

	Growth in Real Weekly Earnings			Prob of Positive Weekly Earnings Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Size: 100+ employees	0.0160***	0.0158***	0.0148**	0.0318***	0.0312***	0.0303***
	(0.005)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)
Constant	0.0445***	0.0673***	0.0638***	0.5167***	0.5180***	0.5007***
	(0.014)	(0.018)	(0.022)	(0.018)	(0.023)	(0.029)
Controls	Y	Y	Y	Y	Y	Y
2-digit industry FE	N	Y	Y	N	Y	N
2-digit occupation FE	N	Y	N	N	Y	Y
4-digit occupation FE	N	N	Y	N	N	Y
N	25623	25623	25623	25623	25623	25623

- Job Stayers in large firms realize a 1.5 pp higher annual earnings growth, and are 3 pp more likely to realize an increase in earnings than job stayers in small firms.

Wage Growth | 4-digit Occupations

Higher Job-to-Job transitions within Large Firms

Dependent Variable: Whether the job stayer switched occupations over the year

	(1)	(2)	(3)
Firm Size: 100+ employees	0.0192***	0.0173***	0.0148***
	(0.001)	(0.001)	(0.001)
Constant	0.0302***	0.0368***	0.0677***
	(0.003)	(0.004)	(0.006)
Controls	Y	Y	Y
2-digit industry FE	N	Y	Y
2-digit occupation FE	N	Y	N
4-digit occupation FE	N	N	Y
N	120565	120565	120565

- Job Stayers in large firms are 1.5 - 2 pp more likely to change their occupation over a year. Q Text

Higher Earnings Growth | J-J trans. in Large Firms

Sample: Job stayers who switched occupations over the year

	Growth in Real Weekly Earnings		Prob of Positive Earnings Growth	
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0598**	0.0631**	0.0863**	0.0924**
	(0.030)	(0.030)	(0.038)	(0.040)
Constant	0.0181	0.1091*	0.5213***	0.5057***
	(0.041)	(0.060)	(0.054)	(0.081)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	N	Y	N	Y
N	1198	1198	1198	1198

- Job Stayers in large firms who switch occupations realize 6 pp higher earnings growth and are 9 pp more likely to receive an earnings increase.
- This accounts for about 15 percent of the overall wage growth of job stayers in large firms. Details Wage Growth

Lower Separations Risk in Large Firms

Dependent Variable: Tenure (in log years)

	(1)	(2)	(3)
Firm Size: 100+ employees	0.152***	0.132***	0.123***
	(0.005)	(0.005)	(0.005)
Constant	0.532***	0.434***	0.571***
	(0.012)	(0.015)	(0.018)
Controls	Y	Y	Y
2-digit occupation FE	N	Y	N
2-digit industry FE	N	Y	Y
4-digit occupation FE	N	N	Y
N	136172	136172	136172

- Job Stayers in large firms realize a tenure that is 1.14 years higher than their small firm counterparts.

Summary: Internal Job Ladder in Large Firms

Job stayers in large firms realize:

- Increased likelihood of occupational switching
- Higher pay growth, higher likelihood of realizing a pay increase
- Higher likelihood and realization of a pay growth, conditional on occupational switching
- Lower separation risk

How have these facts changed overtime?

Evolution of Internal Job Ladders

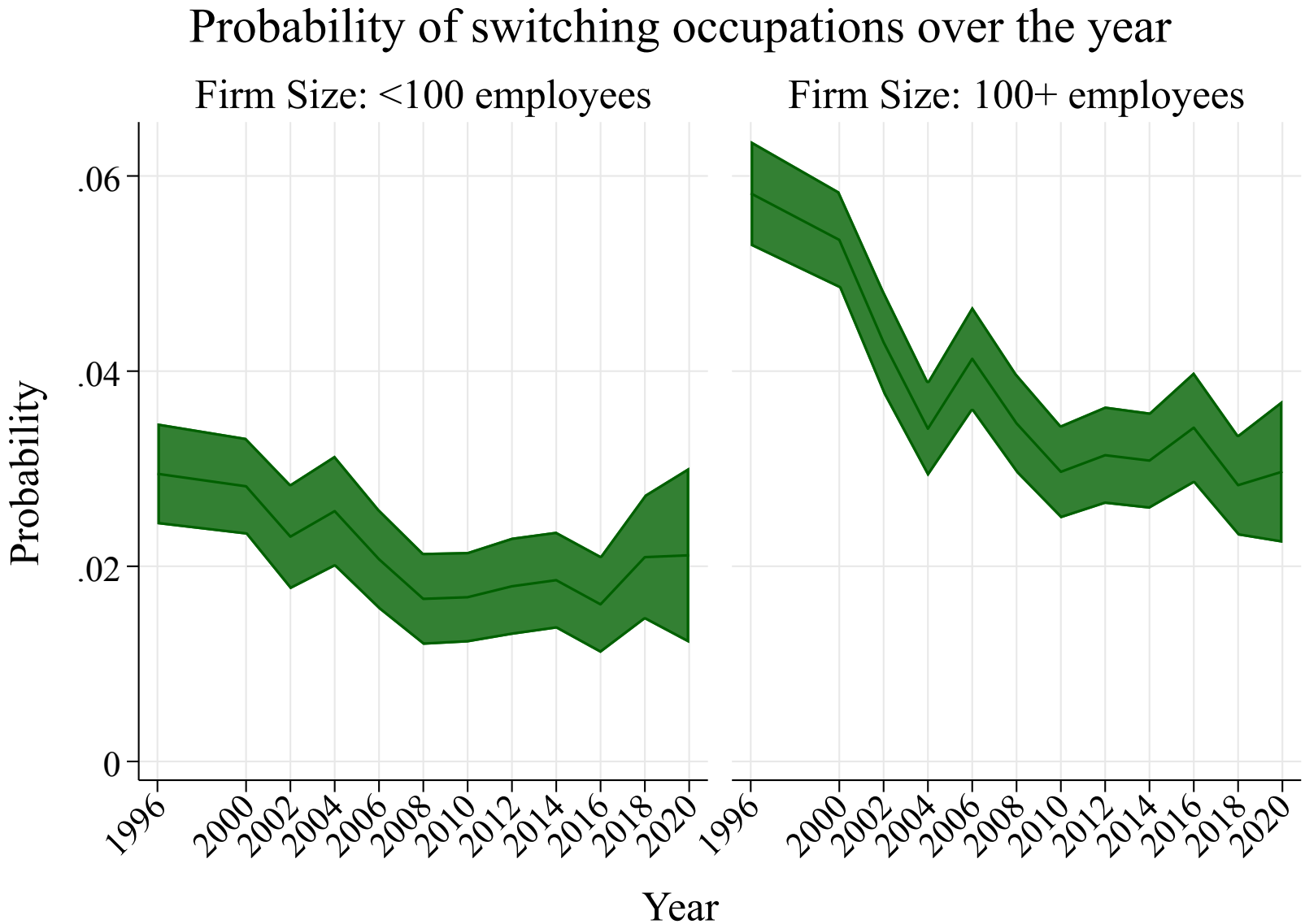
Evolution of Internal Ladders in Large & Small Firms

Dependent Variable: Whether the job stayer switched occupations over the year

	2000-2004		2014-18	
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0205***	0.0183***	0.0148***	0.0138***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	0.0208***	0.0332***	0.0263***	0.0315***
	(0.006)	(0.008)	(0.006)	(0.008)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	N	Y	N	Y
N	36833	36833	25386	25386

- The probability of making within-firm job-to-job transitions have declined overtime, more so for workers in large firms.

Evolution of Internal Ladders in Large & Small Firms



Difference

Evolution of Internal Ladders in Large & Small Firms

Dependent Variable: Probability of Positive Weekly Earnings or Hourly Wage Growth

	Prob of Positive Earnings Growth		Prob of Positive Wage Growth	
	2000-04	2014-18	2000-04	2014-18
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0273*	0.0242	0.0532***	0.0277
	(0.014)	(0.017)	(0.014)	(0.017)
Constant	0.4058***	0.8686***	0.3924***	0.9473***
	(0.048)	(0.214)	(0.048)	(0.215)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	Y	Y	Y	Y
N	7674	5349	7674	5349

- Large firm premium of probability of realizing a pay increase has vanished over time.

Evolution of Internal Ladders in Large & Small Firms

Dependent Variable: Growth in Real Weekly Earnings and Hourly Wages

	Growth in Weekly Earnings		Growth in Hourly Earnings	
	2000-04	2014-18	2000-04	2014-18
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0103	0.0121	0.0179*	0.0056
	(0.010)	(0.013)	(0.010)	(0.013)
Constant	0.0228	0.3444**	0.0009	0.3862**
	(0.036)	(0.167)	(0.035)	(0.162)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	Y	Y	Y	Y
N	7674	5349	7674	5349

- No evidence of changing large firm pay-growth premium in the CPS.
- Evidence of decreasing large firm pay-level premium relative to small firms by 7 pp between 2000-2013 (Bloom et. al., 2018 using data from US SSA).

Decomposing True Dynamism to Internal and External Job Moves

Decomposition Framework

- Let firm types be $j \in \{s, l\}$, and employment share of small firms be ω.
- Let p_j^k be the probability of making a k-type of job switch, where $k \in \{i, x\}$ denotes an internal (i) or external (x) job switch by an employee of a given firm type j.
- Let the true measure of dynamism, jj^*, be the sum of all internal (jj^i) and external (jj^x) job moves.

Static Decomposition

$$
\begin{aligned}
jj_t^* &= \omega_t(p_s^i + p_s^x) + (1-\omega_t)(p_l^i + p_l^x) \\
&= \underbrace{\omega_t p_s^i + (1-\omega_t)p_l^i}_{=jj_t^i} + \underbrace{\omega_t p_s^x + (1-\omega_t)p_l^x}_{=jj_t^x} \\
\frac{djj_t^*}{dt} &= \frac{djj_t^i}{dt} + \frac{djj_t^x}{dt} \\
&= \frac{d\omega_t}{dt}(p_s^i - p_l^i) + \frac{djj_t^x}{dt}
\end{aligned}
$$

Between 2000-2004 and 2014-18:

- $\frac{d\omega_t}{dt}$ = – 0.03
- $(p_s^i - p_l^i)$ ranges between – 0.0147 to – 0.0192
- $\frac{djj_t^x}{dt}$ = – 1.45 pp annual change
- Accounting for within-firm job switching *offsets* the decline in external job switching by about 0.06 pp.

Dynamic Decomposition

$$jj_t^* = \omega_t p_{st}^i + (1-\omega_t) p_{lt}^i + jj_t^x$$

$$\frac{djj_t^*}{dt} = \frac{d\omega_t}{dt}(p_{st}^i - p_{lt}^i) + \omega_t \frac{dp_{st}^i}{dt} + (1-\omega_t)\frac{dp_{lt}^i}{dt} + \frac{djj_t^x}{dt}$$

Between 2000-2004 and 2014-18:

- ω_t = 0.34
- $\frac{dp_{st}^i}{dt}$ = – 0.17 pp
- $\frac{dp_{lt}^i}{dt}$ = – 0.62 pp
- Accounting for the decline in within-firm job switching *amplifies* the decline in external job switching by 0.5 pp (28 percent).

Conclusion

- Job stayers in large firms relative to small firms realize:
  - Higher likelihood of occupational switching
  - Higher wage growth
  - Higher wage growth upon occupational switching
- Accounting for higher J2J transitions *within* firms partially offsets the decline in J2J transitions *across* firms
- However, J2J transitions *within* firms have declined over time
- Accounting for the declining nature of internal dynamism amplifies the overall decline in true dynamism
- Next: A model of internal and external job ladders to understand the determinants of declining internal dynamism

Thank You!

A Model of the Labor Market with External and Internal Job Ladders

Objective

As worker composition shifts towards larger firms:

1. External transitions decline.
    - Workers are employed at large, high productivity firms and have fewer better outside options.
2. Internal transitions increase.
    - As firms get larger, they can use their own employees to fill their vacancies.

Ingredients

1. Frictional labor market with random search.
2. Allow Bertrand competition + OJS (Cahuc, Postel-Vinay & Robin, 2006).
3. Firms are ex-ante heterogeneous in productivity (y).
4. Workers are ex-ante heterogeneous in skill/occupation (s).
5. Partial equilibrium model. Similar to Jarosch (2021).
6. Discrete time and continuum of infinitely lived workers and firms.

Assumptions

1. In each period a worker can either realize a skill shock (at rate χ) or sample an offer (at rate λ) but not both.

   $\Longrightarrow$ Workers sample offers from a distribution $F(y|s)$.

2. If s and y are ranked, then a worker can go from (y_i, s_j) to $(y_{i'>i}, s_j)$, but not to $(y_{i'>i}, s_{j'<j})$.

3. Assume s-shocks for employed are positive and for unemployed are negative.

4. The number of tiers in the occupation ladder is the same for all y-types.

Value Functions

- $W(y, q, s)$: Worker's value at firm y with an occupation level s, with the last offer from firm-type q (with an occupation level s).
- $J(y, q, s)$: Firm's value from the match with worker in 1.
- $P(y, s)$: Match value of the worker and firm pair.
- $V(y)$: Firm's value from being vacant. Equal to zero.
- $U(s)$: Worker's value from being unemployed and at a skill level s.
- Match Value: $W(y, q, s) + J(y, q, s) = P(y, s)$, $\forall q \leq y$, $\forall s$.
- Wage Setting:

$$W(y, q, s) = (1 - \alpha)P(q, s) + \alpha P(y, s)$$

- Reservation firm type y_u is one that ensures $U(s) = P(y_u, s)$.
- Job offer distribution well defined: $\sum_{P(x,s)>P(y_u,s)} dF(x|s) = 1$

Unemployed Worker

$$U(s) = z + \beta\Bigg\{U(s) + \underbrace{\chi_u \sum_{U(s')<U(s)} \big(U(s') - U(s)\big) dG_u(s'|s)}_{\text{Skill depreciates in unemployment}}$$

$$\underbrace{+ (1-\chi_u)\lambda_u \sum_{P(x,s)>P(y_u,s)} \big(W(x, y_u, s) - U(s)\big) dF(x|s)}_{\text{Worker finds acceptable job and moves to employment}} \Bigg\}$$

where $g_u(s'|s)$ is such that $s' < s$.

Employed Worker

$$W(y,q,s) = w(y,q,s) + \beta\Big\{ W(y,q,s) + \underbrace{\delta\big(U(s) - W(y,q,s)\big)}_{\text{Match breaks up}}$$

$$\underbrace{+ (1-\delta)\chi_e \sum_{P(y,s')>P(y,s)} \big(W(y,q,s') - W(y,q,s)\big) dG_e(s'|s)}_{\text{Skill upgrade: Occupational switch within firm}}$$

$$+ (1-\delta)(1-\chi_e)\Big[\underbrace{\lambda_e \sum_{P(y,s)>P(x,s)} \big(W(y,x,s) - W(y,q,s)\big) dF(x|s)}_{\text{Outside Offer: Wage increase within firm}}$$

$$\underbrace{+ \lambda_e \sum_{P(x,s)>P(y,s)} \big(W(x,y,s) - W(y,q,s)\big) dF(x|s)}_{\text{Outside Offer: Job switch across firms}} \Big] \Big\}$$

Matched Firm

$$J(y,q,s) = p(y,s) - w(y,q,s) + \beta\Big\{ J(y,q,s) + \underbrace{\delta\big(0 - J(y,q,s)\big)}_{\text{Match breaks up}}$$

$$+ \underbrace{(1-\delta)\chi_e \sum_{P(y,s')>P(y,s)} \big(J(y,q,s') - J(y,q,s)\big) dG_e(s'|s)}_{\text{Worker makes occupational switch within firm}}$$

$$+ (1-\delta)(1-\chi_e)\Big[\underbrace{\lambda_e \sum_{P(y,s)>P(x,s)} \big(J(y,x,s) - J(y,q,s)\big) dF(x|s)}_{\text{Worker gets wage increase within firm}}$$

$$+ \underbrace{\lambda_e \sum_{P(x,s)>P(y,s)} \big(0 - J(y,q,s)\big) dF(x|s)}_{\text{Worker quits and match breaks up}} \Big] \Big\}$$

Joint Value

$$P(y,s) = p(y,s) + \beta\Big\{ P(y,s) + \underbrace{\delta\big(P(y_u,s) - P(y,s)\big)}_{\text{Match breaks up}}$$

$$\underbrace{+ (1-\delta)\chi_e \sum_{P(y,s')>P(y,s)} \big(P(y,s') - P(y,s)\big) dG_e(s'|s)}_{\text{Worker climbs occupation ladder within firm}}$$

$$\underbrace{+ (1-\delta)(1-\chi_e)\lambda_e \alpha \sum_{P(x,s)>P(y,s)} \big(P(x,s) - P(y,s)\big) dF(x|s) \Big\}}_{\text{Worker climbs job ladder across firms}} \quad (1)$$

Deriving the reservation firm type

Unemployed worker value:

$$P(y_u,s) = z + \beta\Big\{ P(y_u,s) + \chi_u \sum_{\mathcal{S}} min\big\{U(s') - U(s), 0\big\} dG_u(s'|s)$$

$$+ (1-\chi_u)\lambda_u \sum_{P(x,s)>P(y_u,s)} \big(\underbrace{W(x,y_u,s)}_{=(1-\alpha)P(y_u,s)+\alpha P(x,s)} - \underbrace{U(s)}_{=P(y_u,s)} \big) dF(x|s) \Big\}$$

$$P(y_u,s) = z + \beta\Big\{ P(y_u,s) + \chi_u \sum_{\mathcal{S}} min\big\{P(y_u,s') - P(y_u,s), 0\big\} dG_u(s'|s)$$

$$+ (1-\chi_u)\lambda_u \alpha \sum_{P(x,s)>P(y_u,s)} \big(P(x,s) - P(y_u,s)\big) dF(x|s) \Big\}$$

Deriving the reservation firm type

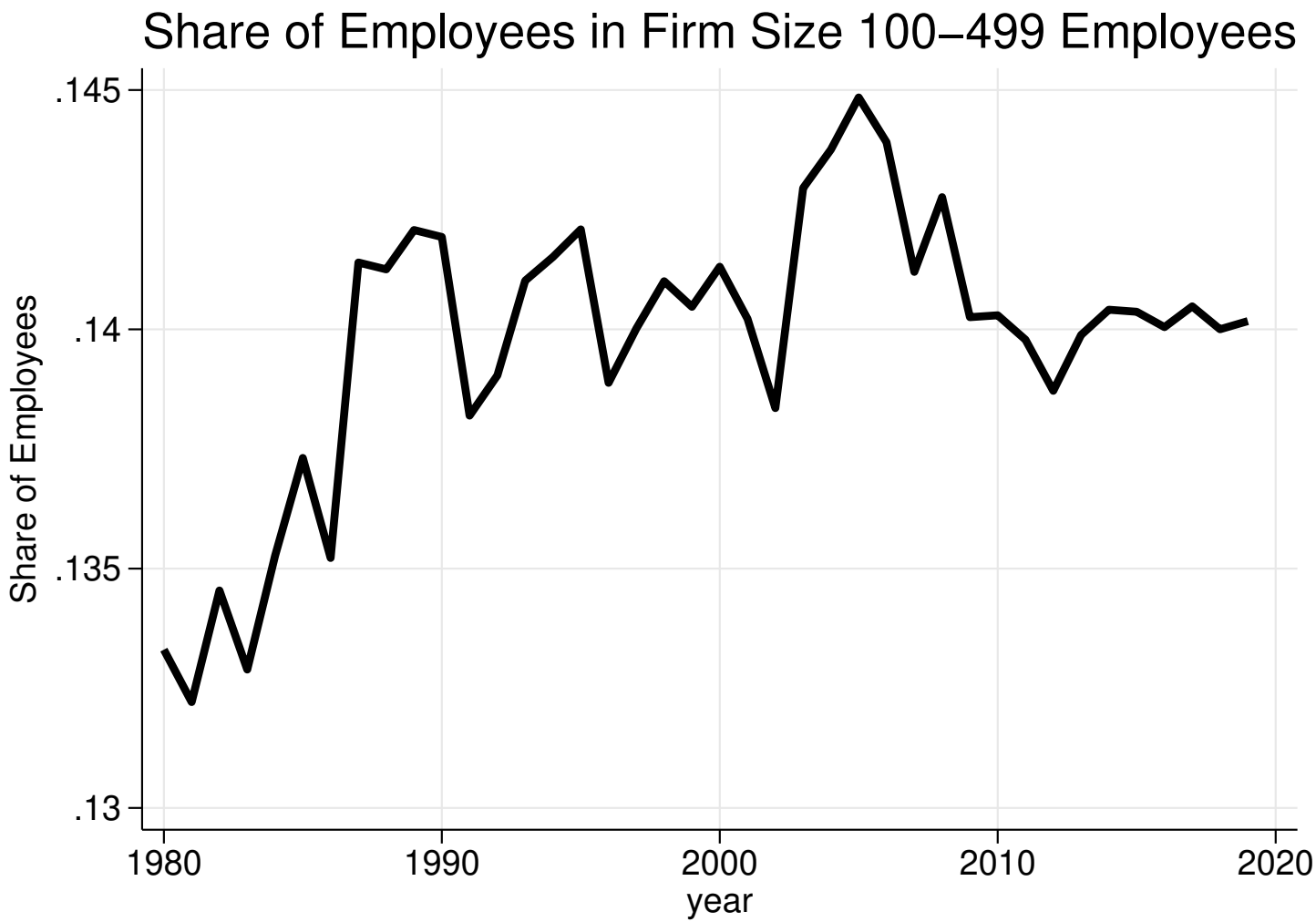
Employed worker value:

$$P(y_u, s) = p(y_u, s) + \beta \Big\{ P(y_u, s)$$
$$+ (1-\delta)\chi_e \sum_{\mathcal{S}} max\big\{P(y_u, s') - P(y_u, s), 0\big\} dG_e(s'|s)$$
$$+ (1-\delta)(1-\chi_e)\lambda_e \alpha \sum_{P(x,s)>P(y_u,s)} \big(P(x, s) - P(y_u, s)\big) dF(x|s) \Big\}$$

Deriving the reservation firm type

$$
\begin{aligned}
p(y_u, s) = z + \beta \Bigg\{ & \chi_u \sum_{\mathcal{S}} min\big\{P(y_u, s') - P(y_u, s), 0\big\} dG_u(s'|s) \\
& - (1-\delta)\chi_e \sum_{\mathcal{S}} max\big\{P(y_u, s') - P(y_u, s), 0\big\} dG_e(s'|s) \\
& + \Bigg((1-\chi_u)\lambda_u - (1-\delta)(1-\chi_e)\lambda_e \Bigg) \\
& \cdot \Bigg(\alpha \sum_{P(x,s) > P(y_u,s)} \big(P(x,s) - P(y_u,s)\big) dF(x|s) \Bigg) \Bigg\}
\end{aligned}
\tag{2}
$$

The model can be solved by solving equations (1) and (2)



Source: Business Dynamics Statistics back

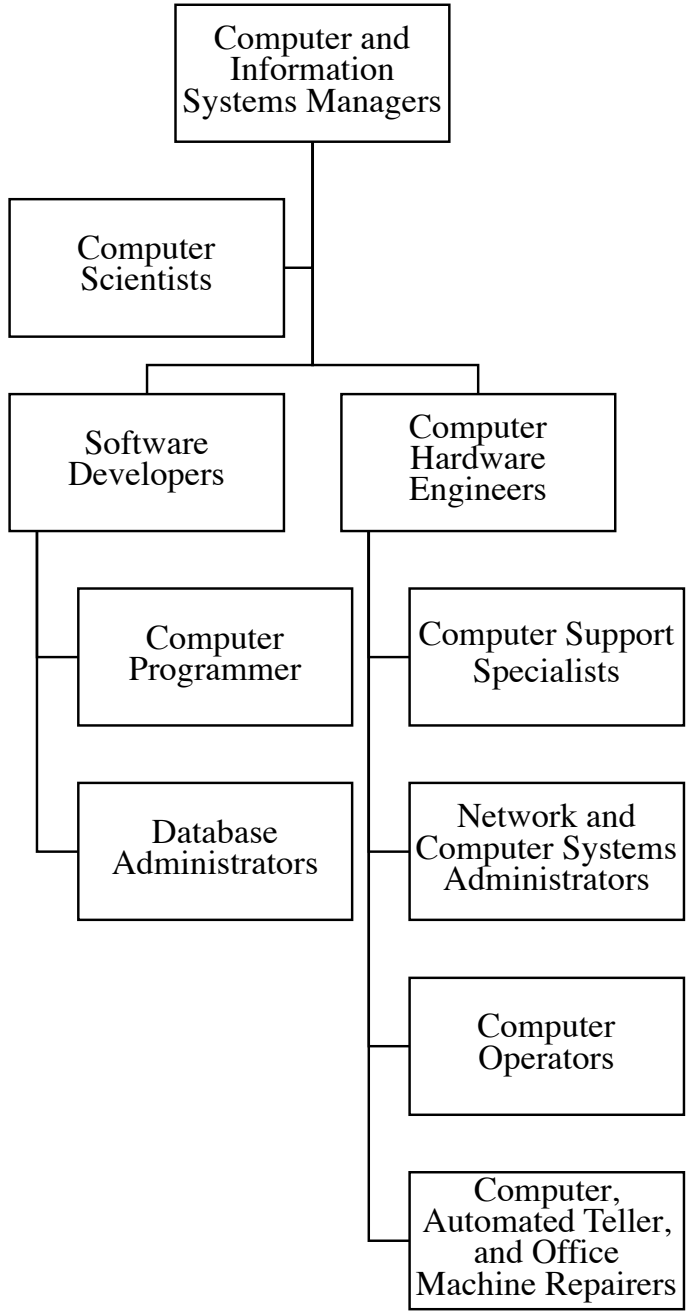
Higher Wage Growth in Large Firms

	Growth in Real Hourly Wages			Prob of Positive Hourly Wage Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Size: 100+ employees	0.0125**	0.0138**	0.0130**	0.0378***	0.0378***	0.0351***
	(0.005)	(0.005)	(0.006)	(0.008)	(0.008)	(0.008)
Constant	0.0369***	0.0554***	0.0512**	0.5062***	0.4953***	0.4940***
	(0.013)	(0.018)	(0.021)	(0.018)	(0.023)	(0.029)
Controls	Y	Y	Y	Y	Y	Y
2-digit industry FE	N	Y	N	N	Y	N
2-digit occupation FE	N	Y	Y	N	Y	Y
4-digit occupation FE	N	N	Y	N	N	Y
N	25623	25623	25623	25623	25623	25623

Back: Earnings Growth

- About 450 codes based on Census' 2010 classification scheme.

back



Questionnaire Text

Earlier you told me that you are now working as (fill: occupation from basic CPS). Were you doing the same kind of work a year ago, in January of (previous) year?

- Yes
- No
- Don't Know
- Refused
- No Response

back

Higher Wage Growth | J-J trans. in Large Firms

Sample: Job stayers who switched occupations over the year

	Growth in Real Hourly Wages		Prob of Positive Wage Growth	
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0494*	0.0574*	0.0929**	0.1028**
	(0.029)	(0.029)	(0.039)	(0.041)
Constant	-0.0200	0.0315	0.4755***	0.4109***
	(0.040)	(0.062)	(0.054)	(0.080)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	N	Y	N	Y
N	1196	1196	1196	1196

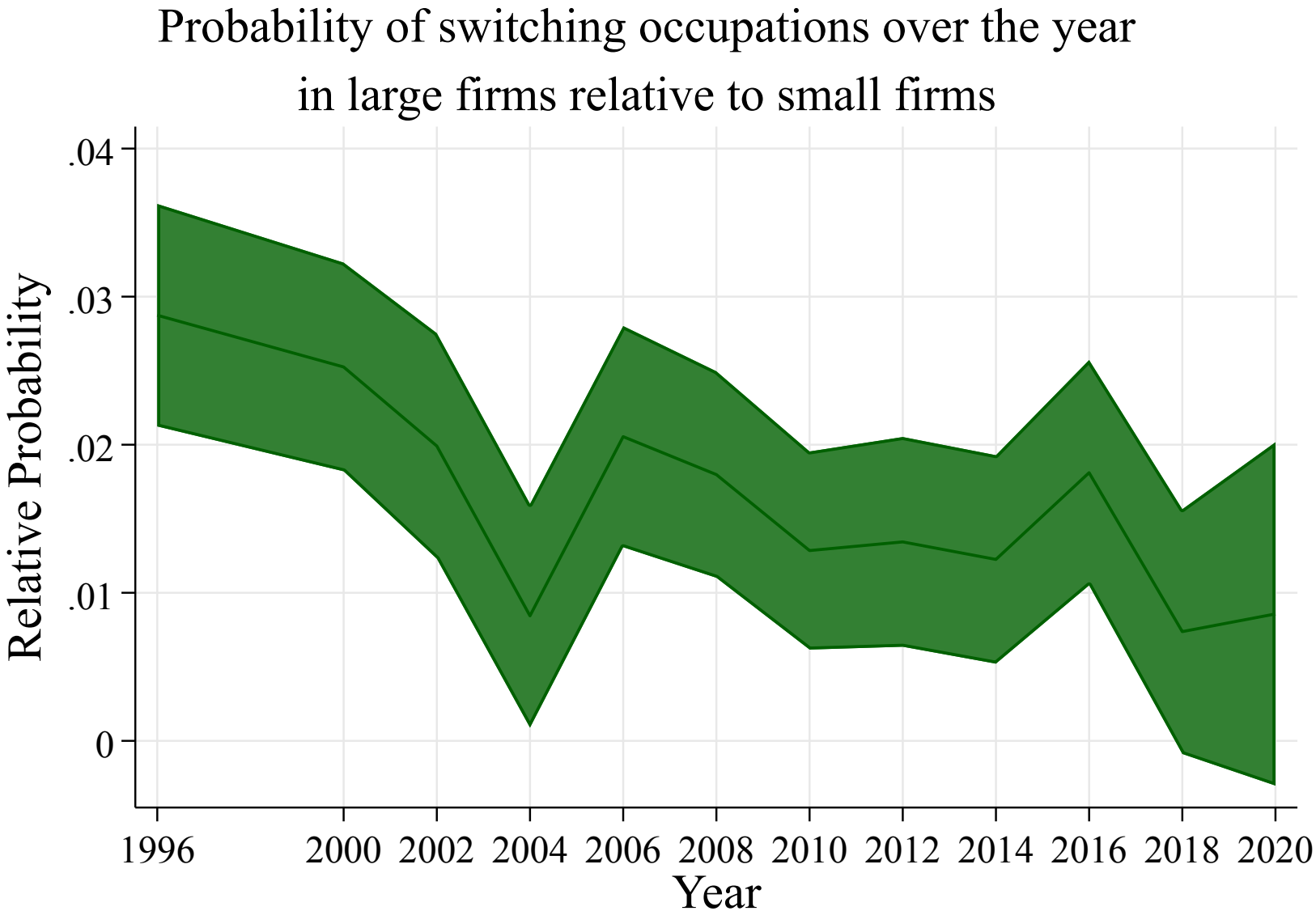
back

Decomposing Growth in Real Weekly Earnings

	Earnings Growth (1)	Job Switch (2)	Earnings Growth|Switch (3)
Firm Size: 100+ employees	0.0107**	0.0137***	0.0548*
	(0.00469)	(0.00196)	(0.0306)
Constant	0.302***	0.114***	0.117
	(0.102)	(0.0412)	(0.560)
Controls	Y	Y	Y
2-digit Ind, Occ FE	Y	Y	Y
N	46082	40070	1198
R^2	0.00997	0.0186	0.125

- Fraction of Wage Growth account by Occupation Switching = (Earnings Growth | Switch) $\times \frac{\text{Sample of Switchers}}{\text{Total Sample}} \times \frac{1}{\text{Overall Earnings Growth}}$ back

Evolution of Internal Ladders in Large & Small Firms



back