Labor Market Policy, Worker Careers, and Aggregate Productivity

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The Static & Dynamic Effects of Labor Market Policy

- A large literature studies the impact of labor market policy on job flows & static misallocation
  - Hopenhayn & Rogerson (1993), Pries & Rogerson (2005), and many others
- Yet labor markets do more than allocate a fixed stock of skills across firms
- They also shape the experiences that workers accumulate over their careers
  - Herkenhoff et al (2024), Acabbi et al (2026), Gregory (2026), among others
- **This paper**: This dynamic career channel is at least as important as the static one
  - More than doubles the estimated productivity cost of policies that reduce worker flows

Three Steps

1. 3 motivating facts on poaching, policy and career outcomes across 15 advanced countries
   (a) Large cross-country differences in the share of workers who are **poached** from another firm
   (b) Poaching is negatively correlated with various labor & entry wedges
   (c) In high-poaching countries, workers experience more wage growth over their careers

2. Equilibrium search model with firms that differ in both **productivity** & **learning environment**
   - Lower policy wedges (regulations, costs, taxes, etc) raise job creation & poaching
   - Higher poaching leads young workers to sort more into good learning-environment jobs

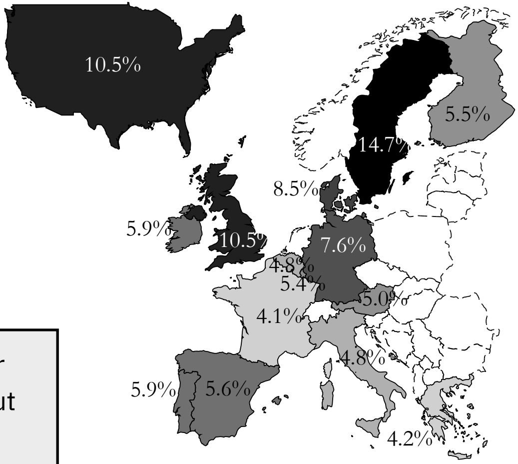
3. Lower policy wedges to raise poaching from the bottom to top quartile:
   - **Static gains**: 4.6% increase in output per worker as workers move into higher productivity jobs
   - **Dynamic gains**: 7.4% increase in output per worker as workers build more skills

Three Motivating Facts

Worker Poaching Differs Sharply Across Countries

- Data: Panel of 15 countries 1993–2024 (Sweden only 2005–2024)
  - ECHP, 1993–2001
  - EU-SILC, 2003–2024
  - PSID, 1993–2023
- Sample: workers aged 20–59

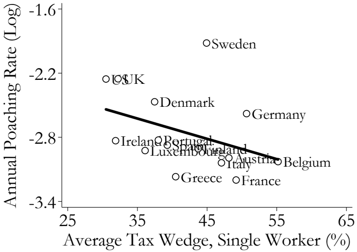
POACHING: Share who began working for their current employer in the past 12 months without an intervening month of nonemployment

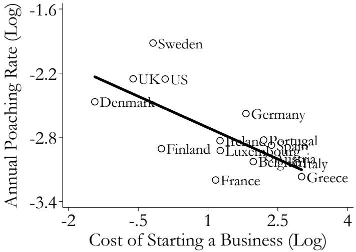


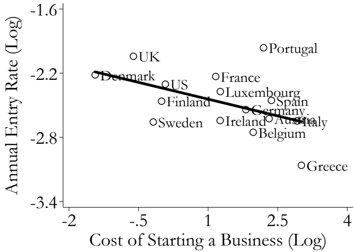
employment validation time series monthly rate

Poaching is Lower Where Labor and Entry Wedges Are Larger

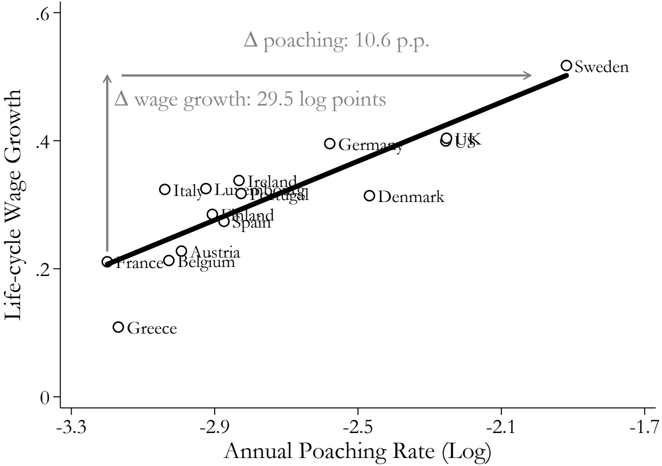
- Negatively correlated with taxes and the cost of starting a business
  - Higher startup costs deter entry and young firms poach a lot (Haltiwanger et al, 2018)
  - Also holds adding the time cost of starting a business
- Negatively correlated with UI generosity, uncorrelated with minimum wages & firing costs







Higher Poaching is Associated with Greater Career Wage Growth



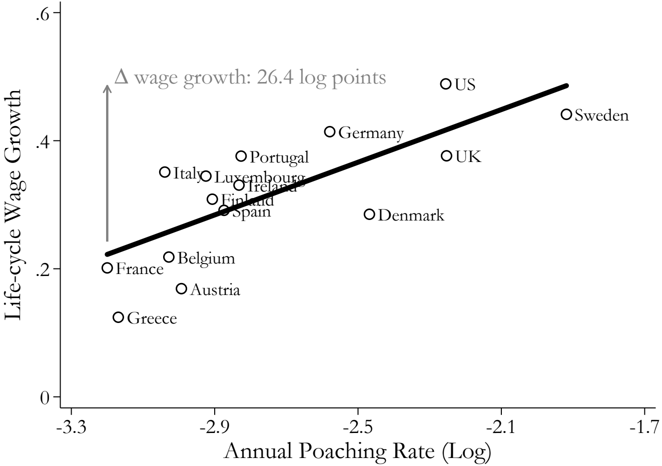
methodology | age | education | occupation | entry wages

Job Stayers Also Grow Their Wage More in High-Poaching Countries

	Baseline	With JJ control	By stayer status
Age 20–39 × poaching rate	0.019***	0.019***	
	(0.004)	(0.003)	
JJ transition in last 12 months		0.035***	
		(0.010)	
× job stayer			0.018***
			(0.004)
× job mover			0.014***
			(0.004)
Observations	1,201,049	1,201,049	1,201,049
Years	28	28	28
Countries	15	15	15

specifications

Wages at the Time of Re-Entry from Nonemployment Also Grow More



Summary & Next Steps

- Three motivating facts
  1. Large cross-country differences in poaching rates
  2. Correlated with policy and regulations
  3. Associated with greater life-cycle wage growth, also among job stayers and re-entrants

Next: Quantify the dynamic effect of policies such as entry barriers on workers' careers

- Building on Herkenhoff et al (2024), Acabbi et al (2026) and Gregory (2026)

Model

Set-Up

- Workers: Enter at age $a = 0$ with log human capital $h = 0$, exit at age A, discount at rate ρ
  - Learning ability $\psi(a) \in [0, 1]$
  - When a worker changes employer, her log human capital falls by ϵ

- Firms: M firms differ in **productivity** and **learning environment** $(y, x) \in \mathcal{E}$

$$\begin{aligned} \text{output} &= e^{y+h} \\ \dot{h}(a) &= \psi(a)x \end{aligned}$$

- Markets: Random search, CD matching with efficiency χ and elasticity w.r.t. vacancies α
  - Cahuc, Postel-Vinay & Robin (2006) counter-offer bargaining with worker bargaining power β
  - Bilaterally efficient outcomes: **focus on joint value of match**

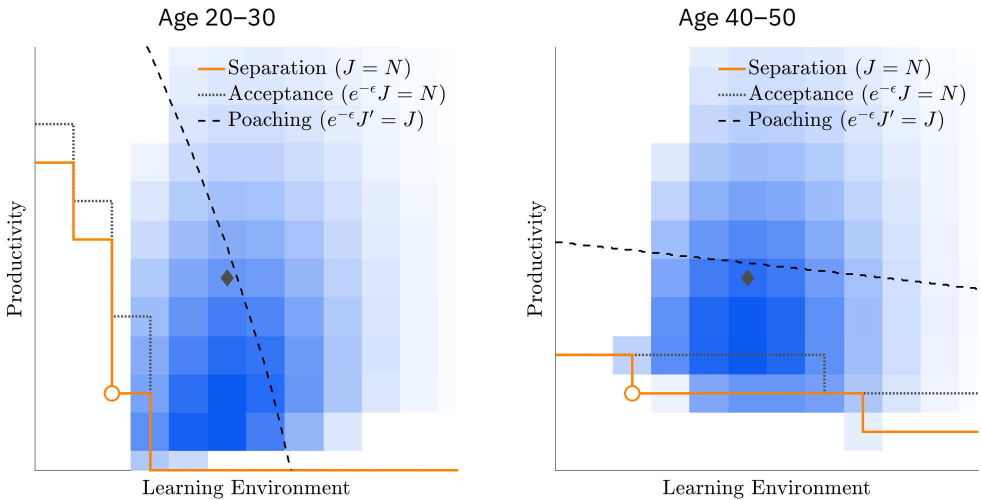
The Joint Value of a Match Combines Output, Learning and Outside Options

$$\underbrace{J(y,x,a)}_{\text{scaled joint value of match}} = e^{-h} \underbrace{\mathcal{J}(y,x,a,h)}_{\text{joint value of match between firm } (y,x) \text{ and worker } (a,h)}$$

$$\begin{aligned}\big(\rho+\delta(a)+\iota\big)J(y,x,a) &= \underbrace{e^{y}}_{\text{scaled output}} + \underbrace{\psi(a)xJ(y,x,a)}_{\text{learning}} \\ &+ \underbrace{J_a(y,x,a) + \big(\delta(a)+\iota\big)N(a)}_{\text{aging and job loss at } \delta(a) \text{ or firm exit at } \iota} \\ &+ \underbrace{\phi p \beta \int_{\mathcal{M}(y,x,a)} \Big(e^{-\epsilon}J(\tilde{y},\tilde{x},a) - J(y,x,a)\Big)dF(\tilde{y},\tilde{x})}_{\text{outside offer at rate } \phi p \text{ from offer distribution } F(y,x)}\end{aligned}$$

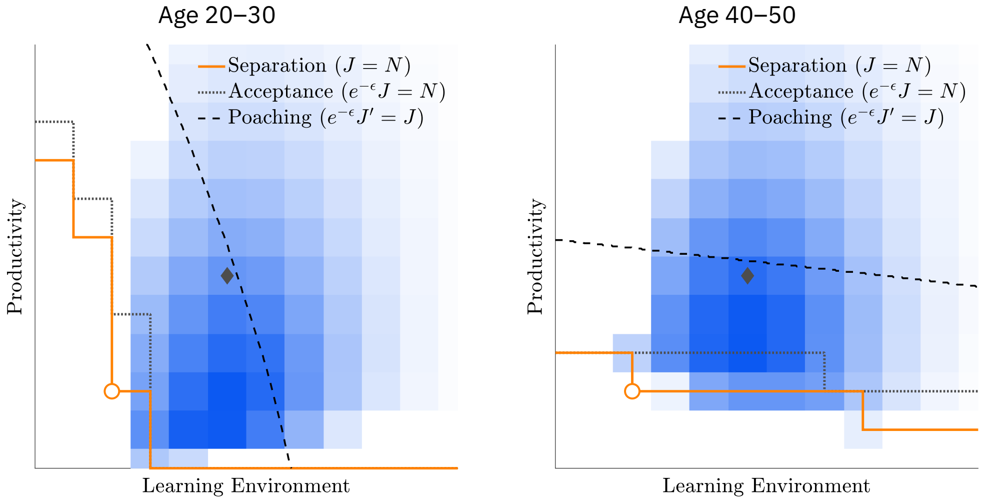
value of nonemployment

As Workers Age, They Place More Weight on Current Productivity



Question: How Does Policy Affect Worker Careers?

As Workers Age, They Place More Weight on Current Productivity



Question: **How Does Policy Affect Worker Careers?**

Job & Firm Creation

- **Incumbent firms**: Advertise v vacancies at cost $\frac{c_v}{1+\eta}v^{1+\eta}$ (with $\eta > 0$)

$$\underbrace{c_v v(y,x)^{\eta}}_{\text{marginal cost}} = \underbrace{q}_{\text{contact rate}} * \underbrace{Q(y,x)}_{\text{value of a worker contact to the firm}}$$

- **Entrant firms**: Pay c_e for a random draw from the entry distribution $\Gamma(y,x)$

$$\underbrace{c_e}_{\substack{\text{cost of starting} \\ \text{a business}}} = \mathbb{E}\left[\text{value of an entrant}\right]$$

Policy Equivalence

- Taxes, vacancy and entry costs affect the equilibrium only through

$$\underbrace{c}_{\text{cost composite}} \equiv (1-\underbrace{\tau}_{\text{tax on match output}})^{-\frac{1+\eta}{\eta}} \underbrace{c_v}_{\text{incumbent wedge}}^{\frac{1}{\eta}} \underbrace{c_e}_{\text{entry wedge}} \underbrace{\chi}_{\text{matching efficiency}}^{-\frac{1+\eta}{\alpha\eta}}$$

- Conditional on the same change in c, these policies have identical effects
  - Exception: firm size moments (later used to separate c_v and c_e)

Higher Poaching Leads Workers to Sort More into Learning Jobs

Locally along any stable eq. branch, **a lower** c

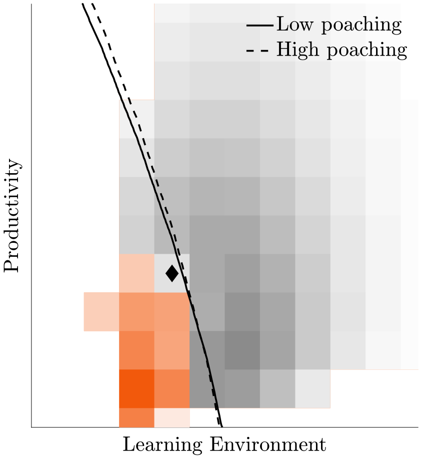
1. Raises poaching

$$\frac{dp}{dc} \quad < \quad 0$$

2. For ϵ small, increases the value workers attach to learning jobs—the reservation locus $y_r(x, a)$ defined by $J(y_r, x, a) = N(a)$ satisfies

$$y_r'(x, a) \; < \; 0, \qquad \frac{dy_r'(x, a)}{dc} \; > \; 0$$

3. Shifts job creation toward high-learning jobs



$f_{\text{high}} - f_{\text{low}}$, with gray (orange) denoting > 0 (< 0)

Calibration

9 Parameters to Fit a Hypothetical Average-Poaching Country

- Assumptions

$$\psi(a) = \left(\tfrac{A-a}{A}\right)^{\psi} \qquad y \sim \text{Exponential} \qquad \text{sd}(y) = \sigma_y$$

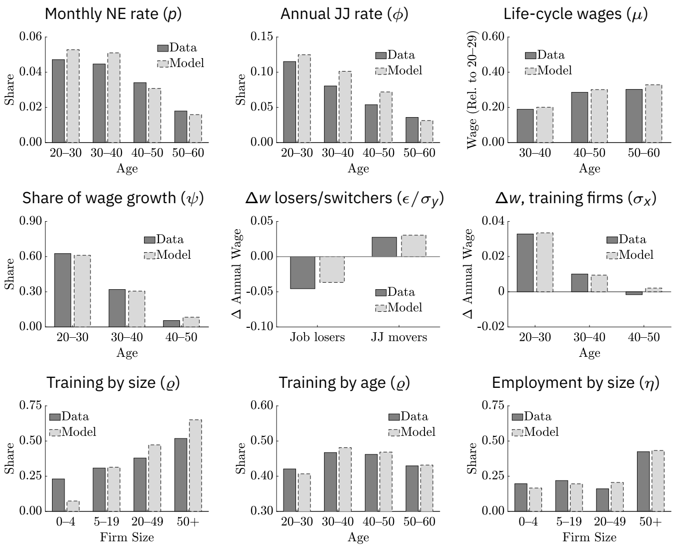
$$b(a):\ J(y_r, x_r, a) = N(a) \qquad x \sim \mathcal{N}(\mu, \sigma_x^2) \qquad \text{rank corr}(y, x) = \varrho$$

- 6 pre-set parameters, 4 calibrated externally $\Rightarrow$ 9 parameters to estimate internally

$$\mathbf{p} = \Big(\underbrace{p}_{\text{job finding rate}}, \underbrace{\phi}_{\text{OTJ search efficiency}}, \underbrace{\mu}_{\text{mean learning}}, \underbrace{\psi}_{\text{learning decay}}, \underbrace{\epsilon}_{\text{human capital specificity}}, \underbrace{\sigma_y}_{\text{productivity dispersion}}, \underbrace{\sigma_x}_{\text{learning dispersion}}, \underbrace{\varrho}_{y\text{–}x \text{ rank corr.}}, \underbrace{\eta}_{\text{vacancy curvature}} \Big)$$

- Chosen to minimize model-data distance in 31 dimensions

Moments

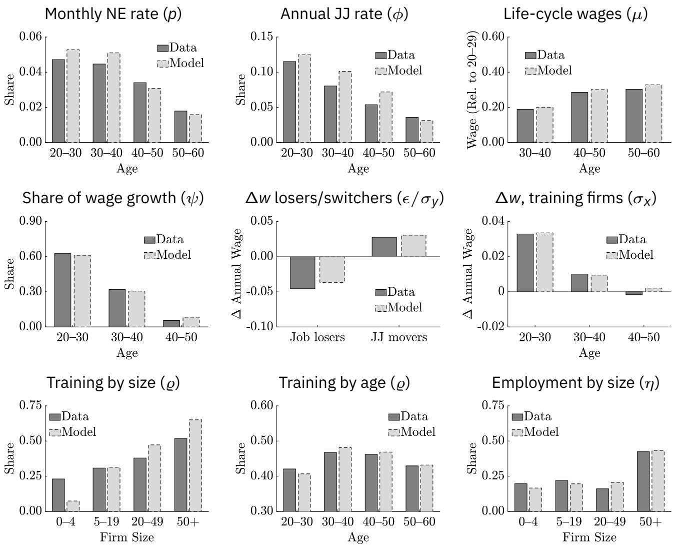


training dynamics

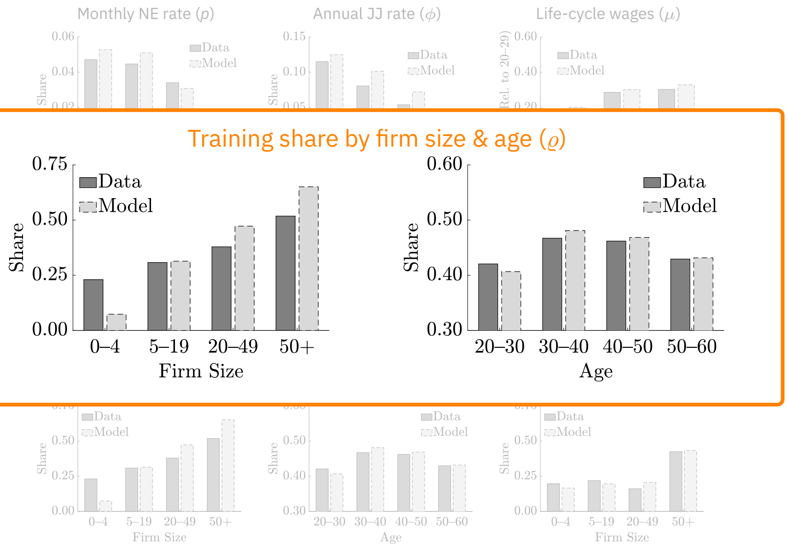
Moments

Monthly NE rate (p)
Annual JJ rate (ϕ)
Life-cycle wages (μ)
Δw, training firms (σ_x)
Δ Annual Wage
0.04
0.02
0
-0.02
Data
Model
20–30
30–40
40–50
Age
Share
0.00
0.30
0–4
5–19
20–49
50+
Firm Size
20–30
30–40
40–50
50–60
Age

Moments


Monthly NE rate (p)
Annual JJ rate (ϕ)
Life-cycle wages (μ)
Share of wage growth (ψ)
Δw losers/switchers (ϵ/σ_y)
Δw, training firms (σ_x)
Training by size (ϱ)
Training by age (ϱ)
Employment by size (η)
Data
Model
Share
Wage (Rel. to 20–29)
Δ Annual Wage
Age
Firm Size
20–30
30–40
40–50
50–60
Job losers
JJ movers
0–4
5–19
20–49
50+
0.00
0.02
0.04
0.06
0.05
0.10
0.15
0.20
0.40
0.60
0.30
0.90
-0.05
-0.10
0
-0.02
0.25
0.50
0.75
0.60

Moments



training dynamics

Parameter Estimates

Panel A. Calibrated parameters

p	Job finding rate	0.053
ϕ	On-the-job search efficiency	0.912
μ	Mean learning environment ($\times$100)	-0.299
ψ	Decline in learning ability	2.729
ϵ	HC loss on accepting a new job	0.001
σ_y	Std. dev. of productivity	0.037
σ_x	St.d. learning environment ($\times$100)	0.169
ϱ	Rank correlation of y and x	0.460
η	Vacancy cost curvature	1.192

Panel B. Implied parameters

c_v	Vacancy cost scale	38.48
c_e	Cost of starting a business	9.379
c	Cost composite	539.9
M	Mass of firms	0.306
$e^{b(a)}$	Flow value of leisure	
	Age 20–30	0.433
	Age 30–40	0.885
	Age 40–50	1.075
	Age 50–60	1.101

4 Wedges to Match Cross-Country Data

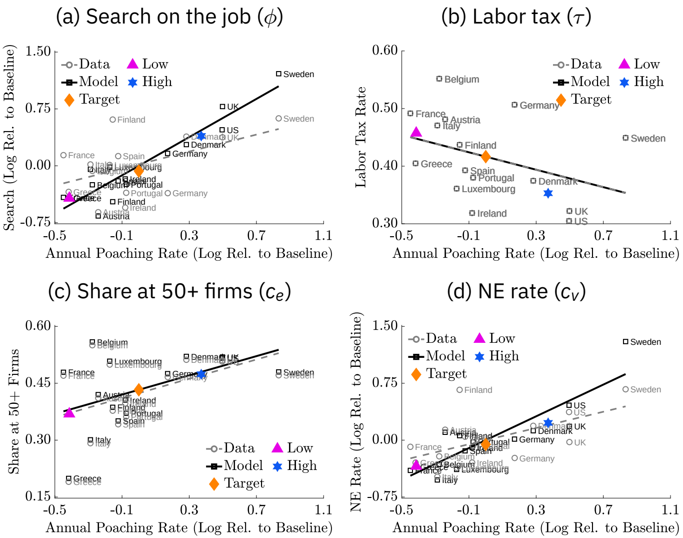
4 country-specific wedges:

1. ϕ: Rel. search efficiency
2. τ: Tax rate on match output
3. c_e: Entry wedge
4. c_v: Incumbent wedge

4 Wedges to Match Cross-Country Data

4 country-specific wedges to match aggregate poaching and:

1. ϕ: Search on-the-job
2. τ: Worker+empl. labor tax
3. c_e: Share at 50+ firms
4. c_v: NE rate



leisure

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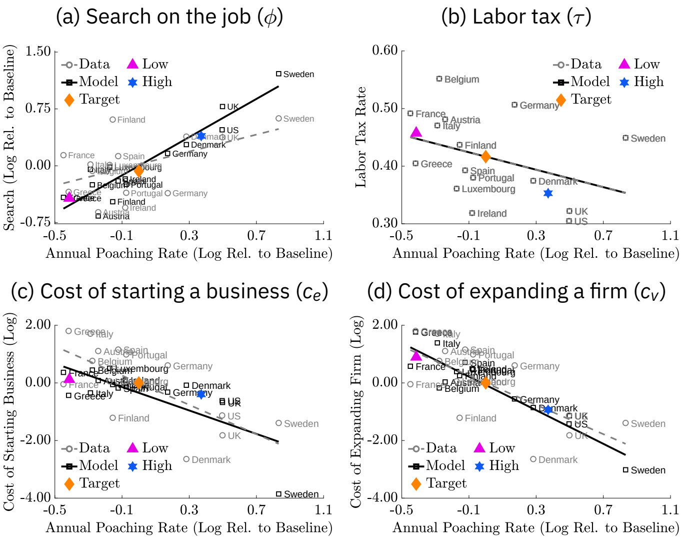
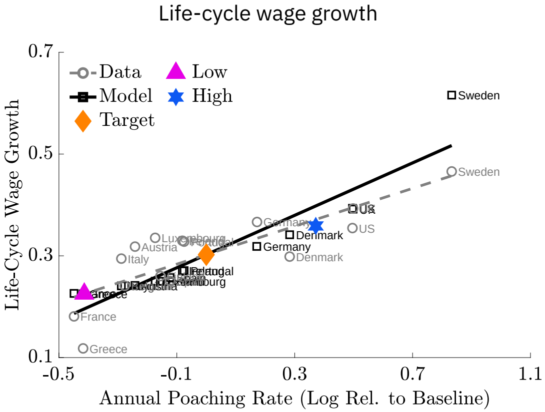
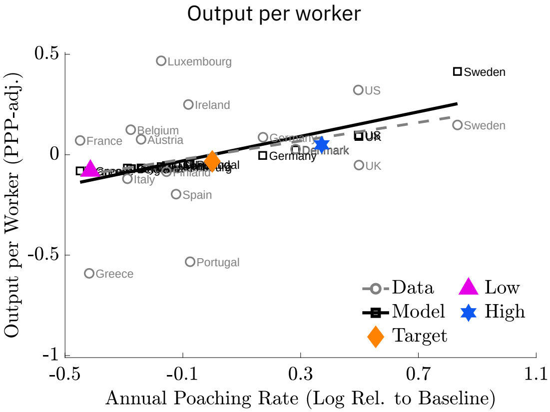


leisure

The Dynamic Consequences of Misallocation

Differences in 4 Policy Wedges Account for 36% of Variation in Wage Growth





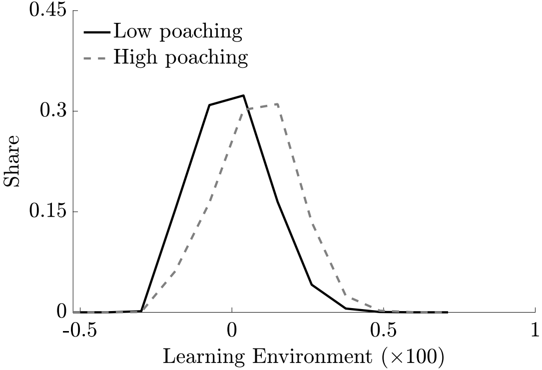
entry wages | decomposition | employment | in isolation

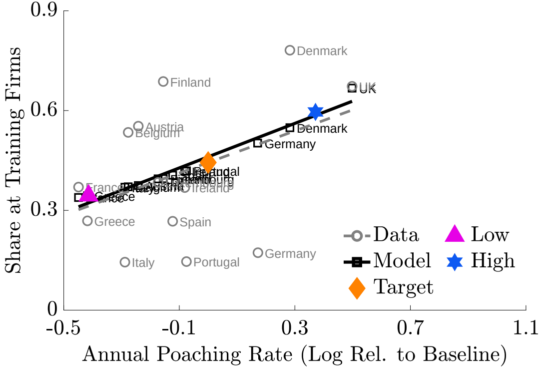
Dynamic Misallocation Doubles the Productivity Loss

- **Policy experiment**: bottom- to top-poaching-quartile wedges
- **Comparison**: model with unaffected skill accumulation
  - Estimated to the same targets

	Baseline	Policy-invariant skills
Job-finding rate (p.p.)	3.0	2.6
Employment rate (p.p.)	12.5	7.8
Life-cycle wage growth (log points)	13.3	3.5
Match productivity	3.6	2.7
Human capital	7.1	0.0
Piece rate	2.9	0.7
Output per worker (log points)	12.1	6.0
Match productivity	4.6	5.9
Human capital	7.4	0.0

Young Workers Sort More into High-Training Firms in Both Data and Model

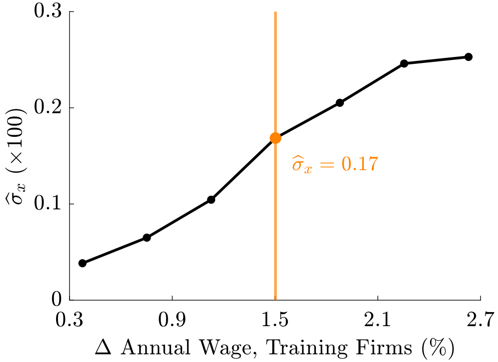




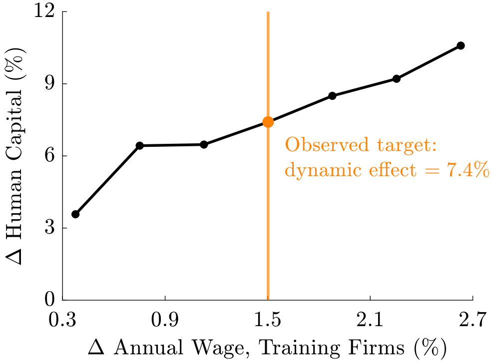
The Large Dynamic Effect Is Disciplined by Training-Wage Evidence

Vary the training-wage target $\Longrightarrow$ Re-estimate all parameters $\Longrightarrow$ apply the same policy change

(a) Estimated learning dispersion $\widehat{\sigma}_x$



(b) Human-capital effect of the Q1→Q4 policy



Smaller observed training gains would lead to smaller estimated dynamic effects of policy

Conclusion

Labor Market Policy, Worker Careers, and Aggregate Productivity

- Policies that reduce worker flows generate static misallocation of workers across firms

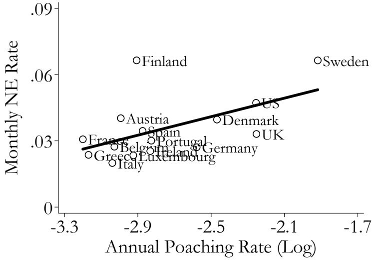
- But they also affect the experiences that workers accumulate over their careers
  - They shift young workers away from good learning environment jobs

- **Dynamic misallocation doubles the productivity loss** from policies that reduce flows

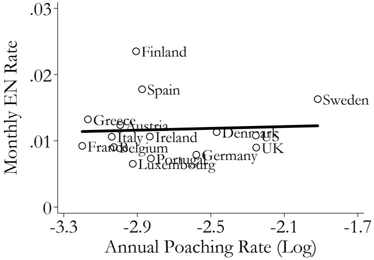
Appendix

Worker Flows by Poaching

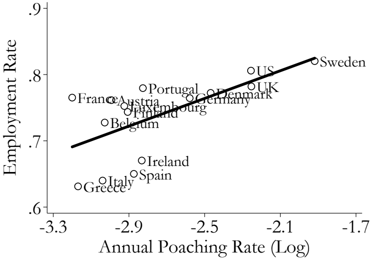
(a) Nonemployment to employment



(b) Employment to nonemployment



(c) Employment rate



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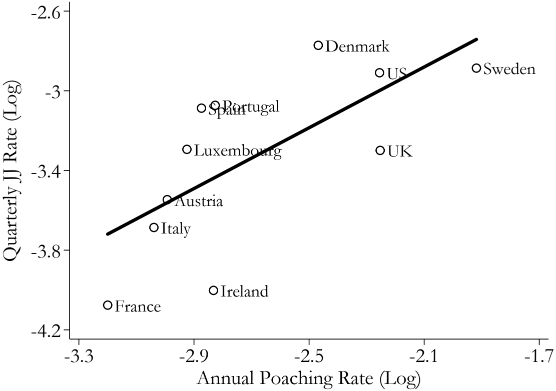
Validation against Donovan-Lu-Schoellman

Contrast with quarterly JJ rate of Donovan, Lu & Schoellman (2023)

- Different data source
- Different sample period
- Only some countries in both surveys

Yet matches well



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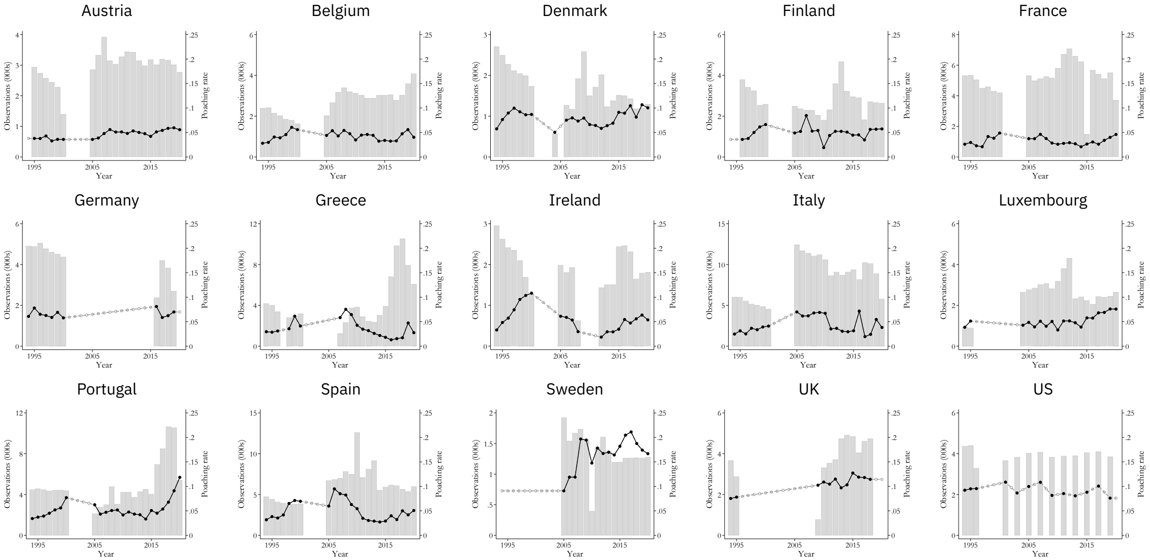
Poaching Rate & # of Observations with Valid Poaching by Country



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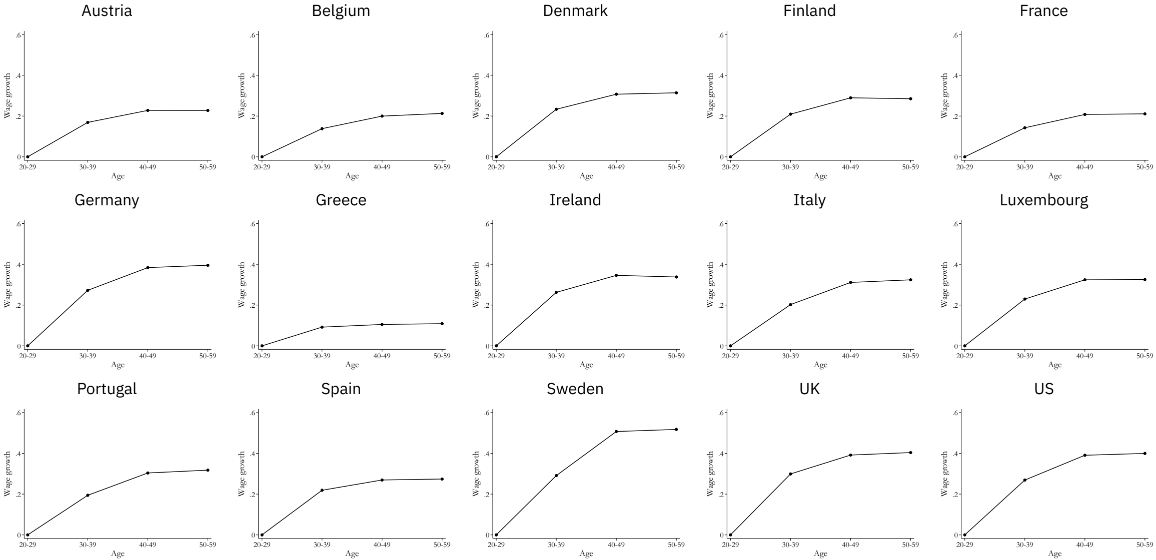
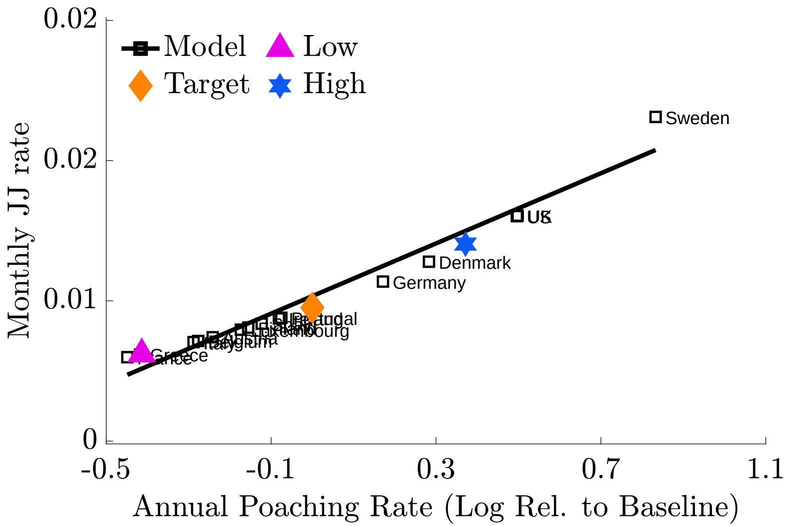
Estimated Life-Cycle Wage Profiles by Country



Monthly Poaching Rate across Countries



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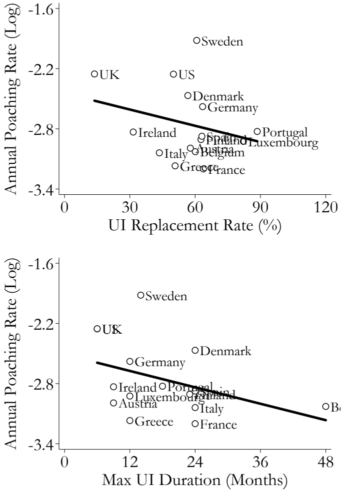
Unemployment Insurance: Replacement Rate & Potential Duration

- Replacement rate: UI benefits relative to prior earnings
- Potential duration: # months benefits can be drawn (max duration for a 40yo with a long contribution history)
  - Belgium effectively indefinite, capped at 48 for plotting
- Neither is strongly correlated with poaching



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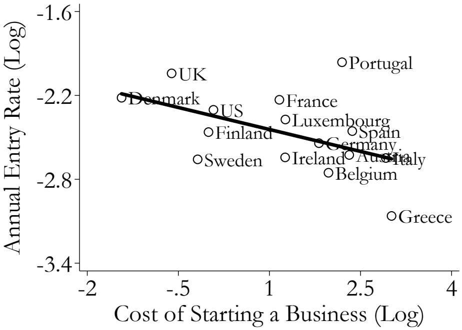
Firm Entry Rate vs. the Cost of Starting a Business

- The cost of starting a business is negatively correlated with the firm entry rate
- Consistent with young firms poaching a lot (Haltiwanger et al, 2018; Bilal et al, 2022)



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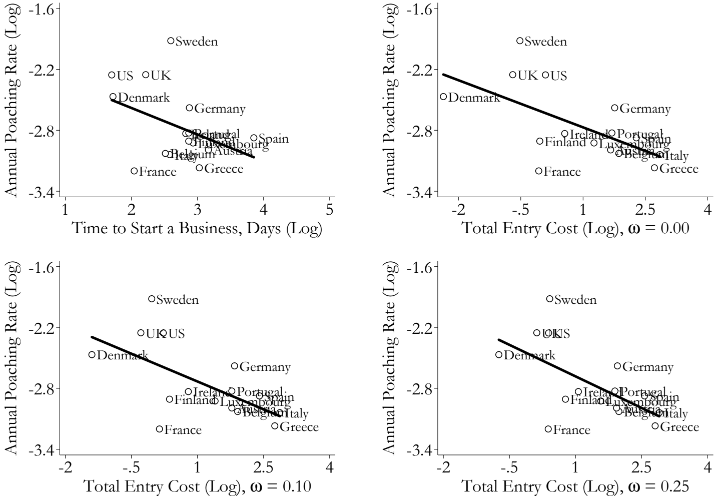
Poaching and the Time Cost of Starting a Business

World Bank IC.REG.DURS (2003–2019): days to register a business.

- Adds a **time** wedge to the fee wedge
- Total cost, in % of GNI p.c.:

$$\text{fees}_{ct} + 100\,\omega\,\frac{\text{days}_{ct}}{365}$$

- Days are **elapsed**, not worked—so $\omega < 1$
- Slope is negative for every ω: -0.16 to -0.21



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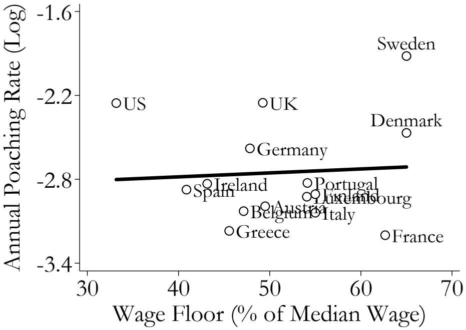
Poaching and Minimum Wages

- Minimum wage relative to the median—weakly correlated with poaching



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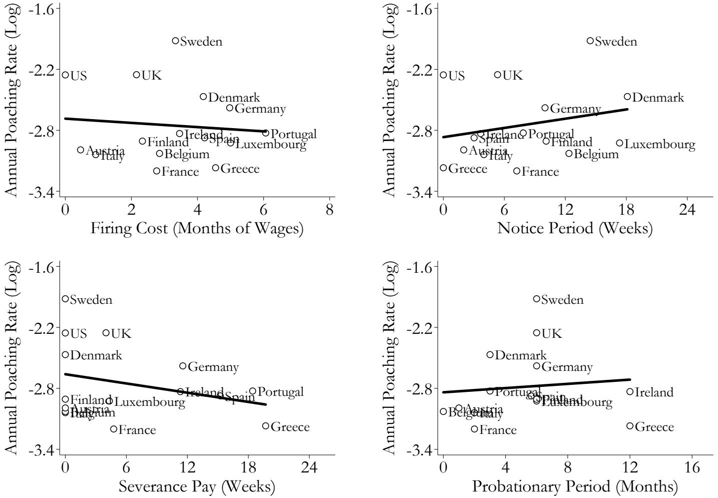
Poaching and Dismissal-Cost Components

World Bank Employing Workers (2003–2019), for a standard redundancy dismissal averaged over 1/5/10 years of tenure:

- **Redundancy cost** (months of pay): total statutory cost, $=$ notice $+$ severance
- **Notice period** (weeks): advance warning the employer must give
- **Severance pay** (weeks of pay): lump sum owed on dismissal
- **Probation** (max months): initial period of unrestricted dismissal — more probation means more flexibility



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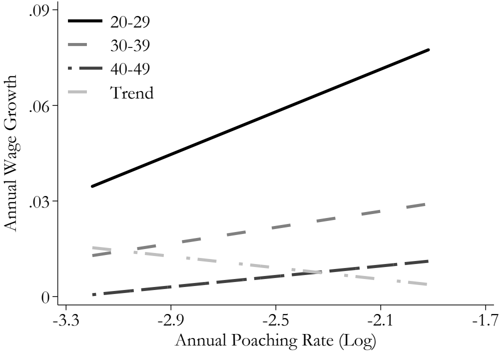
Wage Growth by Age

- Compute annual wage growth in age groups 20–29, 30–39, 40–49, 50–59
- Express relative to 50–59 (“Trend”)
- Wages grow faster in high-poaching countries, especially at young ages



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By Education & Gender

Table 1: Life-Cycle Wage Growth and the Poaching Rate

		College		Male	
Poaching × age	0.012***	0.012***	0.009***	0.013***	0.010***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
Control × age		0.016***	0.013***	0.005***	0.003***
		(0.001)	(0.001)	(0.001)	(0.001)
Poaching × age × control			0.006***		0.004***
			(0.002)		(0.001)
Observations	1,854,494	1,854,494	1,854,494	1,854,494	1,854,494
Years	30	30	30	30	30
Countries	15	15	15	15	15

Notes: OLS estimates of (1). Each column is a separate regression of log hourly wages on the log poaching rate interacted with age, absorbing individual, country×year, and restricted age fixed effects. Column (1) is the pooled specification. Columns (2)–(3) add the age slope interacted with college, and column (3) further adds its triple interaction with the poaching rate; columns (4)–(5) repeat this with an indicator for male. The "Control" rows therefore refer to college in columns (2)–(3) and to male in columns (4)–(5). Standard errors clustered by country in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Source: ECHP 1993–2001; EU-SILC 2003–2024; PSID 1993–2023.

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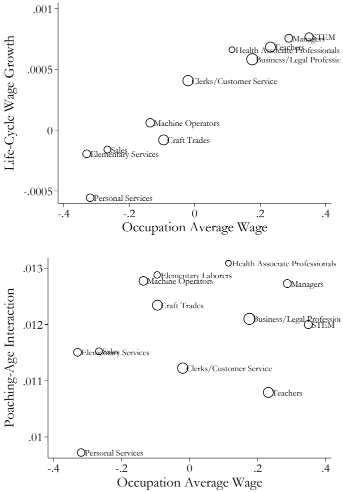
By Occupation

- Estimate occupation-specific age slopes and their interaction with poaching:

$$\log w_{it} = \sum_o \left[\alpha_o + \beta_o \ln(\text{poach}_c)\right] \mathbf{1}\{o_{it}=o\}\, a_{it} + \alpha_i + \gamma_{ct} + \xi_a + \varepsilon_{it}$$

- Plot α_o (life-cycle growth) and β_o (sensitivity to poaching) against the occupation's average wage
- High-wage occupations grow faster
- Their sensitivity to poaching does not vary with the occupation wage



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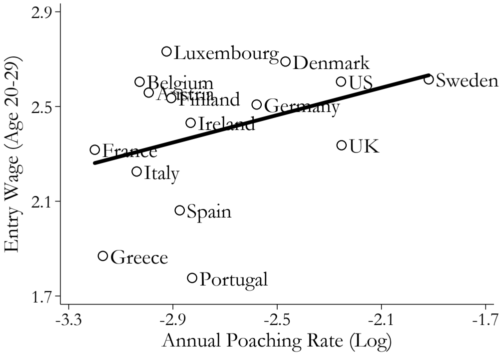
Entry Wages

- Mean hourly wage of young workers (ages 20–29) vs the log poaching rate
- Wages are PPP-adjusted
- Entry wages are higher in high-poaching countries—workers do not start from a lower base and catch up



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Estimating Life-Cycle Wage Profiles

Estimate country-specific life-cycle wage profiles

$$\log w_{i,t} \quad = \quad \xi_i + \xi_{c,t} + \xi_{c,a} + \varepsilon_{i,t} \tag{1}$$

- α_i worker FE, γ_{ct} country-year FE, ξ_{ca} country-age profile
- Country-age effects flat after 45 to break collinearity of person, year & age FEs
- Profiles have similar concave shape in all countries

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Wage Growth & Poaching: Underlying Specifications

$y_{it} \equiv \mathbf{1}\{a_{it} < 40\} \ln(\text{poaching}_c)$; μ's are country×yr, age×yr, educ×yr, gender×yr, occ×yr FEs; weighted, clustered by country

1. **Baseline**

$$\Delta \log w_{it} \quad = \quad \gamma\, y_{it} \;+\; \mu_{ct} + \mu_{at} + \mu_{et} + \mu_{gt} + \mu_{ot} \;+\; \varepsilon_{it}$$

2. **With JJ control**—adds an indicator for a job-to-job move in the past 12 months

$$\Delta \log w_{it} \quad = \quad \gamma\, y_{it} \;+\; \alpha\, \mathrm{JJ}_{it} \;+\; \mu_{ct} + \mu_{at} + \mu_{et} + \mu_{gt} + \mu_{ot} \;+\; \varepsilon_{it}$$

3. **By stayer status**—$s_{it} = 1$ if no JJ move <u>and</u> no hire from nonemployment. The country×year effect differs by s_{it}, so stayers and movers are compared within country-year

$$\Delta \log w_{it} \quad = \quad \gamma_0\, y_{it}(1 - s_{it}) \;+\; \gamma_1\, y_{it} s_{it} \;+\; \mu_{cts} + \mu_{at} + \mu_{et} + \mu_{gt} + \mu_{ot} \;+\; \varepsilon_{it}$$

No main effect of y_{it}, so γ_1 and γ_0 are the gradients for stayers and movers

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The (Scaled) Value of Nonemployment

$$\underbrace{N(a)}_{\substack{\text{scaled}\\\text{value}}} = e^{-h} \underbrace{\mathcal{N}(h,a)}_{\substack{\text{value of nonemployment}\\\text{at age } a \text{ with skills } h}}$$

$$\rho N(a) = \underbrace{e^{b(a)}}_{\substack{\text{flow value of}\\\text{leisure: } e^{b(a)+h}}} + \underbrace{N'(a)}_{\text{aging}} + \underbrace{p\beta \int_{\mathcal{A}(a)} \left(e^{-\epsilon} J(y,x,a) - N(a)\right) dF(y,x)}_{\text{job offer at rate } p \text{ from offer distribution } F(y,x)}$$

$$\mathcal{A}(a) = \left\{(y,x) : e^{-\epsilon} J(y,x,a) > N(a)\right\}$$

back

Existence & Uniqueness

1. **Existence.** Under standard regularity assumptions, an equilibrium exists
2. **Uniqueness.** A sufficient weak-complementarity condition that ensures uniqueness is

$$\underbrace{\frac{(1+\phi)\,\overline{p}(c)}{\eta(\rho+\iota+\underline{\delta}-\overline{x})}}_{\substack{\text{search/vacancy}\\ \text{feedback}}}\underbrace{\left(1+\frac{\overline{x}-\underline{x}}{\rho+\iota+\underline{\delta}-\overline{x}}\right)}_{\substack{\text{learning}\\ \text{amplification}}} \quad < \quad 1$$

   - Easier when mobility is lower (lower $\overline{p}(c)(1+\phi)$) or vacancy creation is less responsive (larger η)
   - Easier when learning heterogeneity is weaker (smaller $\overline{x}-\underline{x}$)

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Equilibrium

Equilibrium is a fixed point $Q = \mathcal{T}(Q)$, where the $\mathcal{T}$ consists of

1. Given Q: the job finding rate and offer distribution are

$$p = \left(\frac{\eta}{1+\eta} \frac{1}{\rho+\iota} \frac{1}{c} \int_{\mathcal{E}} Q^{\frac{1+\eta}{\eta}} d\Gamma \right)^{\frac{\eta\alpha}{(1-\alpha)(1+\eta)}}, \qquad f = \frac{Q^{\frac{1}{\eta}} d\Gamma}{\int_{\mathcal{E}} Q^{\frac{1}{\eta}} d\Gamma}$$

2. Given (p, f): J, N, $\mathcal{A}$, $\mathcal{M}$, $\mathcal{P}$ and $\mathcal{C}$ solve the HJBs
3. Given $(p, f, \mathcal{A}, \mathcal{M}, \mathcal{P}, \mathcal{C})$: the efficiency-weighted $\hat{n}$, $\hat{g}$ solve the KFEs, and S is total search
4. Given $(J, N, \mathcal{A}, \mathcal{P}, \hat{n}, \hat{g}, S)$: the value of a worker contact to a firm is

$$\mathcal{T}(Q)(y,x) = (1-\beta) \int_0^A \left(\frac{\hat{n}}{S} \mathbb{1}_{\mathcal{A}} (e^{-\epsilon} J - N) + \frac{\phi}{S} \int_{\mathcal{P}} (e^{-\epsilon} J - J(\tilde{y}, \tilde{x})) \hat{g}(\tilde{y}, \tilde{x}, a) d\tilde{y} d\tilde{x} \right) da$$

back

The Efficiency-Weighted Measures of Workers

- Define the efficiency-weighted measures

$$\begin{aligned}\hat{n}(a) &= \int e^h \tilde{n}(a,h)dh \\ \hat{g}(y,x,a) &= \int e^h \tilde{g}(y,x,a,h)dh\end{aligned}$$

- Since workers enter nonemployed with $h = 0$, $\hat{n}(0) = 1$ and $\hat{g}(y,x,0) = 0$

- They evolve according to

$$\begin{aligned}\hat{n}_a &= -pF(\mathcal{A})\,\hat{n} + \int_{\mathcal{C}(a)} (\delta+\iota)\,\hat{g}\,dydx + \oint_{\partial\mathcal{C}(a)} \hat{g}\,v_n\,d\ell \\ \hat{g}_a &= \psi(a)x\,\hat{g} - (\delta+\iota)\,\hat{g} - \phi pF(\mathcal{M})\,\hat{g} + e^{-\epsilon}\left(pf\mathbb{1}_{\mathcal{A}}\,\hat{n} + \phi pf\int_{\mathcal{P}} \hat{g}\,d\tilde{y}d\tilde{x}\right)\end{aligned}$$

back

The Integrated Measures of Workers

- Let $n(a) = \int \tilde{n}(a,h)dh$ and $g(y,x,a) = \int \tilde{g}(y,x,a,h)dh$
- Since workers enter nonemployed, $n(0) = 1$ and $g(y,x,0) = 0$
- Since mobility is independent of human capital, they evolve according to

$$
\begin{aligned}
n_a &= -pF(\mathcal{A})\,n + \int_{\mathcal{C}(a)} (\delta+\iota)\,g\,dydx + \oint_{\partial\mathcal{C}(a)} g\,v_n\,d\ell \\
g_a &= -(\delta+\iota)\,g - \phi pF(\mathcal{M})\,g + \left(pf\mathbb{1}_{\mathcal{A}}\,n + \phi pf \int_{\mathcal{P}} g\,d\tilde{y}d\tilde{x} \right)
\end{aligned}
$$

- Total search efficiency is $S = \int n(a)da + \phi\left(1 - \int n(a)da\right)$

back

The Value of a Worker Contact to the Firm

The value of a worker contact to a firm (y, x) is

$$Q(y,x) \quad = \quad (1-\beta)\int_0^A \int e^h \left(\frac{\tilde{n}}{S} \mathbb{1}_{\mathcal{A}}(e^{-\epsilon}J - N) + \frac{\phi}{S} \int_{\mathcal{P}} (e^{-\epsilon}J - J(\tilde{y},\tilde{x}))\tilde{g} \right) dhda$$

where $\tilde{n}(a,h)$ and $\tilde{g}(y,x,a,h)$ are the measures of nonemployed and employed

distributions of firms and vacancies back

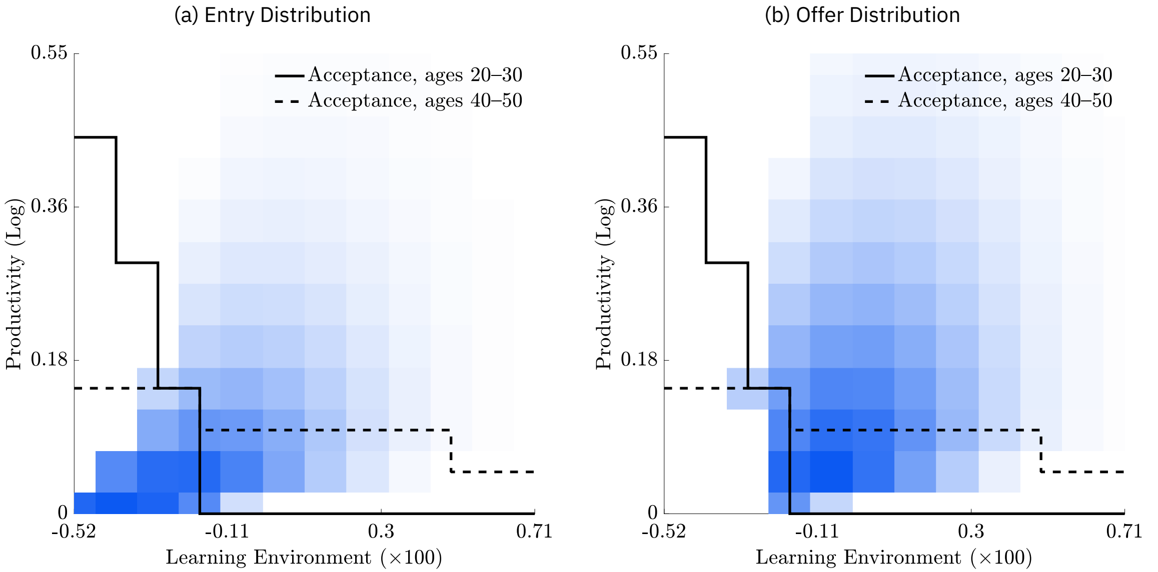
The Value of an Entrant

An entrant pays c_e for a random draw from $\Gamma(y, x)$ and then hires optimally over its life-time

$$\underbrace{c_e}_{\text{cost of starting a business}} = \int_{\mathcal{E}} \underbrace{\frac{1}{\rho+\iota}\frac{\eta}{1+\eta}\left(\frac{1}{c_v}\right)^{\frac{1}{\eta}}\left(\chi^{\frac{1}{\alpha}} p^{\frac{\alpha-1}{\alpha}} Q(y, x)\right)^{\frac{1+\eta}{\eta}}}_{\text{discounted net return from optimal hiring over firm's life-time}} \, d\Gamma(y, x)$$

distributions of firms and vacancies back

Entry & Offer Distributions



The Full Measures of Workers

- Let $\tilde{n}(a,h)$ be the measure of nonemployed workers over age and human capital

$$\tilde{n}_a = \underbrace{-\,p\,F\big(\mathcal{A}(a)\big)\,\tilde{n}}_{\text{accept a job}} + \underbrace{\int_{\mathcal{C}(a)} \big(\delta(a)+\iota\big)\,\tilde{g}\,dydx}_{\substack{\text{job loss}\\ \text{or firm exit}}} + \underbrace{\oint_{\partial\mathcal{C}(a)} \tilde{g}\,v_n\,d\ell}_{\substack{\text{match dissolves}\\ J=N}}, \qquad \tilde{n}(0,h) = \delta_{\{h=0\}}$$

- Let $\tilde{g}(y,x,a,h)$ be the measure of employed workers over firms, age and human capital

$$\tilde{g}_a + \underbrace{\psi(a)\,x\,\tilde{g}_h}_{\text{learning}} = \underbrace{-\big(\delta(a)+\iota\big)\tilde{g}}_{\substack{\text{job loss}\\ \text{or firm exit}}} \underbrace{-\,\phi p\,F\big(\mathcal{M}(y,x,a)\big)\tilde{g}}_{\text{poached away}} + \underbrace{p\,f(y,x)\,\mathbb{1}_{\mathcal{A}(a)}\,\tilde{n}(a,h+\epsilon)}_{\text{hired from nonemployment}}$$

$$+ \underbrace{\phi p\,f(y,x) \int_{\mathcal{P}(y,x,a)} \tilde{g}(\tilde{y},\tilde{x},a,h+\epsilon)\,d\tilde{y}d\tilde{x}}_{\text{poached from a dominated match}}$$

subject to $\tilde{g}(y,x,0,h) = 0$

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Externally Calibrated Parameters

Parameter	Description	Value	Source
ρ	Discount rate	0.003	4% annual real rate
β	Worker share	0.500	Imposed
χ	Matching efficiency	1.000	Normalized
α	Matching elasticity	0.630	Moscarini and Postel-Vinay (2025)
τ	Labor tax wedge	0.417	OECD Taxing Wages, 2000–2020
ι	Firm exit hazard	0.004	5% annual, employment-weighted

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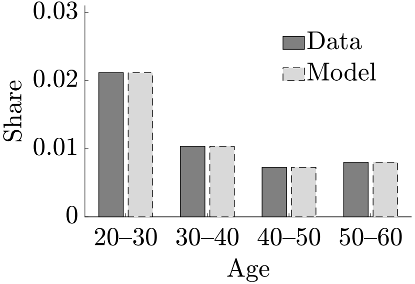
EN Rate by Age

- Take the EN rate by age from the data
- Maps (almost) directly to $\delta(a) + \iota$
  - The model has some endogenous separations
- The model matches closely the data



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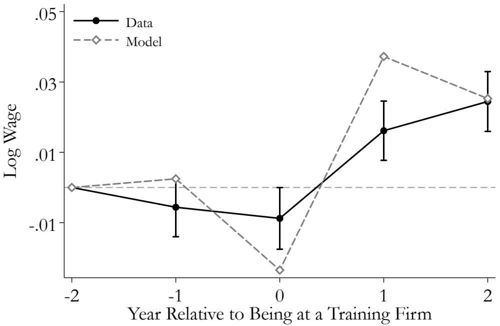
Wage Dynamics Around a Spell at a Training Firm

- “Training firms”: top 45% of learning environment firms by employment
- Wages rise after time at a training firm
- Especially for those who later switch jobs



gain vs. poaching
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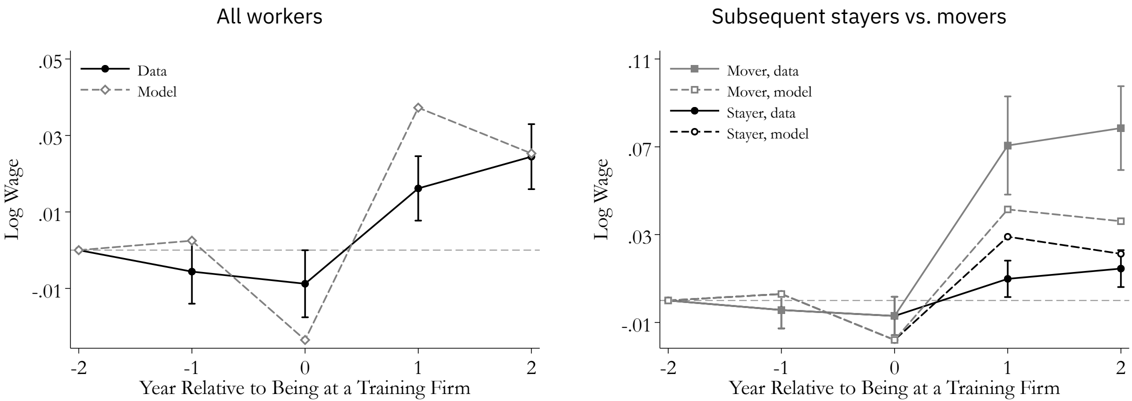
Wage Dynamics Around a Spell at a Training Firm



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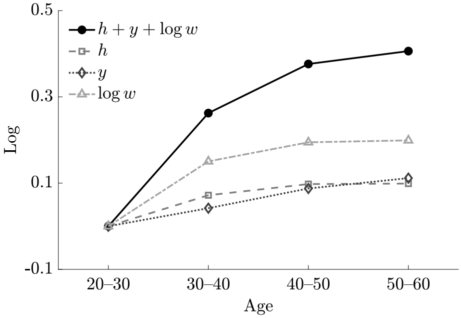
Life-Cycle Decomposition

- Wages are log additive

$$\log W \quad = \quad y + h + \log w$$

- Rising piece rate largest contributor

- Then human capital & productivity



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Identification: Elasticity of Moments to Parameters

Moment	p	ϕ	μ	ψ	ϵ	σ_y	η	σ_x	ϱ
NE mobility rate	**1.01**	0.01	-0.01	0.01	0.00	0.08	-0.15	-0.08	0.12
JJ mobility rate	0.59	**0.55**	-0.00	0.17	-0.00	0.12	-0.10	0.09	0.05
Life-cycle wage growth	0.24	0.22	**0.70**	0.02	-0.02	-0.02	-0.44	1.09	0.06
$(w_{30-40} - w_{20-30}) / (w_{50-60} - w_{20-30})$	0.13	0.12	0.09	**0.24**	0.03	0.07	-0.06	-0.11	0.08
Wage loss of job losers	1.06	0.56	0.23	-0.05	**0.03**	0.70	-0.57	0.42	0.29
Wage gain of JJ movers	0.09	0.24	0.25	0.34	0.27	**1.73**	-0.40	0.36	0.30
Employment share of 50+ firms	0.51	0.53	-0.02	0.05	0.01	0.24	**-0.71**	-0.17	0.08
Δw at training to non-training firms	-0.71	-0.67	-0.25	-0.30	-0.05	0.05	0.10	**0.46**	-0.30
Training at 50+ firms relative to 0–4 firms	-0.06	-0.07	0.03	-0.23	-0.00	-0.39	0.00	0.44	**0.37**

Bold marks the moment most informative about each parameter

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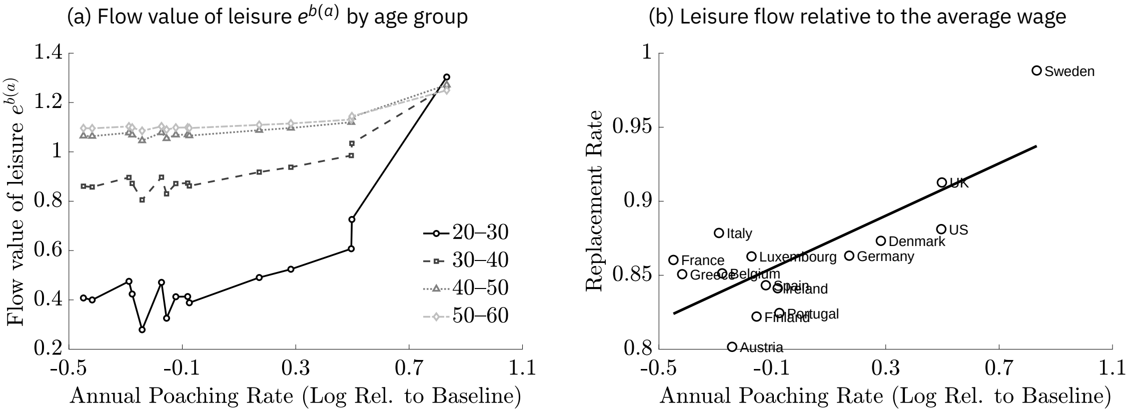
The Flow Value of Leisure across Countries



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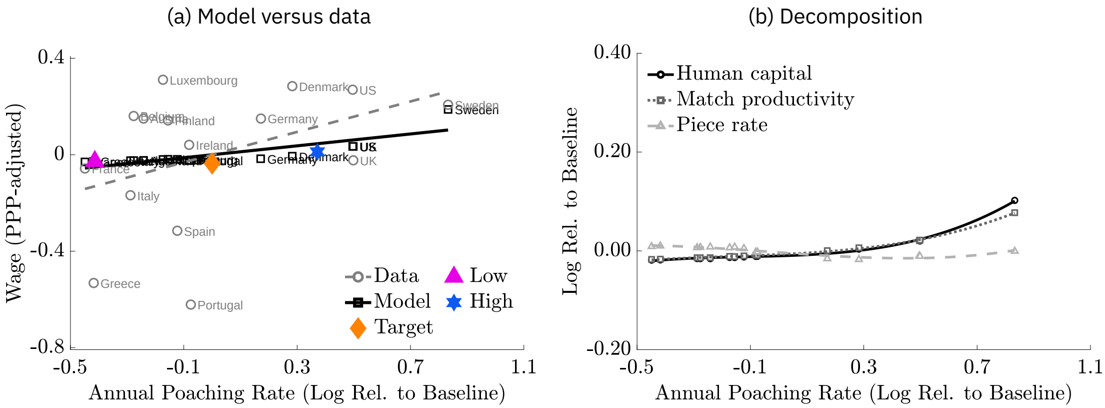
The Combined Impact of Wedges on Wages at Age 20–29



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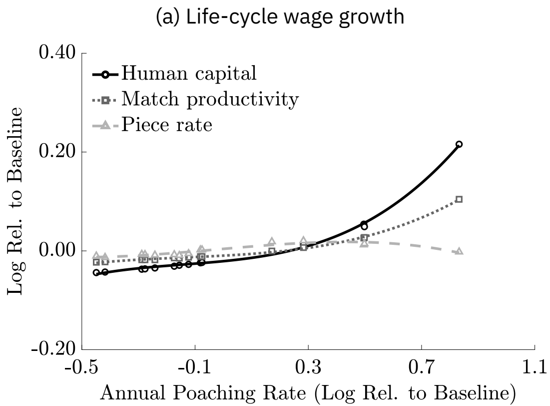
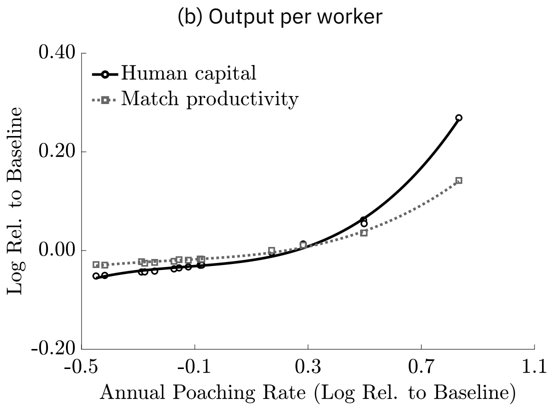
Decomposing Wage Growth & Output: Human Capital vs. Match





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The Wedges in Isolation

	ϕ	τ	c_e	c_v	Combined
Panel A: Share of empirical gradient (slope ratio)					
Poaching rate	0.27	0.06	0.38	0.58	1.00
Wage growth	0.26	0.08	0.51	0.56	1.38
Output per worker	0.17	0.05	0.48	0.49	1.33
Panel B: Pattern correlation (ρ^2)					
Poaching rate	0.86	0.14	0.58	0.78	1.00
Wage growth	0.49	0.06	0.34	0.56	0.57
Output per worker	0.10	0.00	0.00	0.17	0.06
Panel C: Prediction R^2					
Poaching rate	0.45	0.10	0.48	0.73	1.00
Wage growth	0.30	0.05	0.33	0.49	0.36
Output per worker	0.03	0.00	-0.03	0.11	0.00

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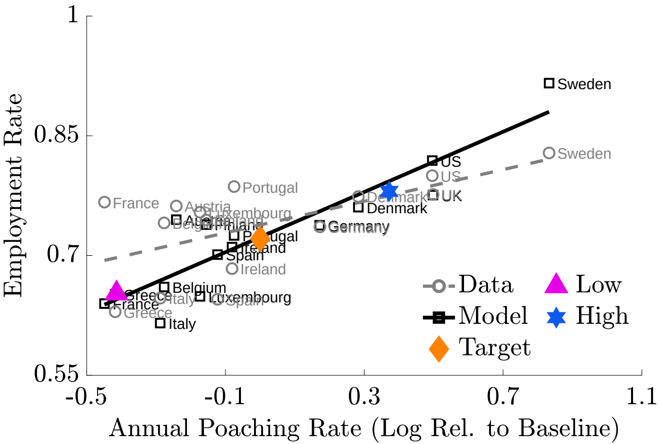
Employment Rate across Countries, Model vs. Data



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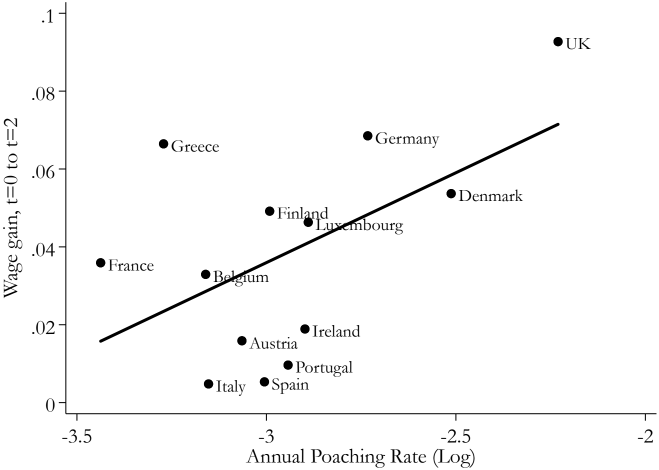
Wage Gain After a Training Spell vs. Poaching



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30% of Total from Changes in Behavior

- Hold all decision rules fixed at baseline, vary only the mechanical effect of p and ϕ
- Alternatively, vary $\lambda^u = p$ holding $\lambda^e = \phi p$ fixed to isolate role of nonemployment

	Baseline	Fixed Policies	Non-employment	Poaching
$\lambda_u \equiv p$	3.0	3.0	3.0	0.0
$\lambda_e \equiv \phi p$	7.5	7.5	0.0	7.5
Output per worker	12.1	8.7	0.5	11.6
Match productivity	4.6	3.4	0.0	4.6
Human capital	7.4	5.2	0.5	7.0

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Policy Wedges: Baseline vs. Exogenous Skills

	Baseline	Policy-invariant skills
$\log \phi$	0.82	0.82
τ	-10.4	-10.4
c_e	-0.52	-0.52
c_v	-1.83	-1.83

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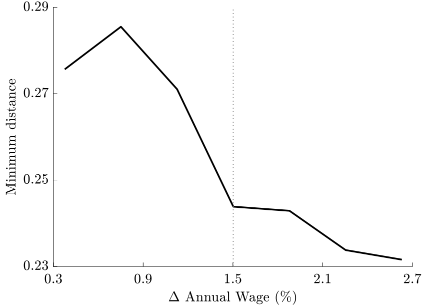
Re-Estimation under the Scaled Training Moment

(a) Estimated σ_y

(b) Minimum distance



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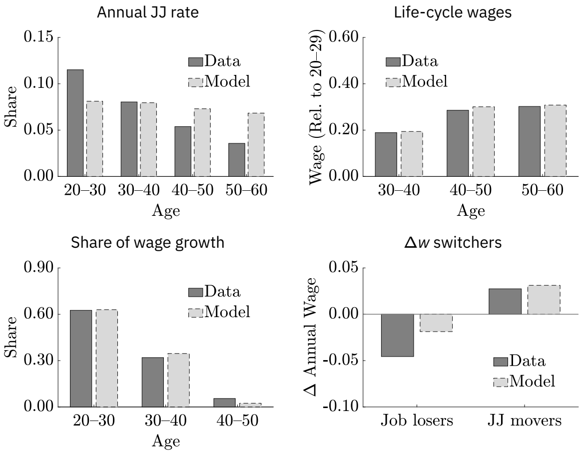
Exogenous Skills: Model Fit & Estimated Parameters



	Description	Value
ϕ	On-the-job search efficiency	0.533
μ	Mean learning environment ($\times$100)	0.216
ψ	Decline in learning ability	0.939
σ_y	Std. dev. of productivity	0.040
η	Vacancy cost curvature	1.192

Moment	ϕ	μ	ψ	σ_y
JJ rate	**0.64**	-0.00	0.00	-0.00
Wage growth	0.04	**0.92**	-0.54	0.06
Concavity	0.01	0.01	**0.20**	-0.01
Δw, movers	0.05	0.01	0.03	**0.97**

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