The Minimum Wage and Occupational Mobility

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Motivation and Question

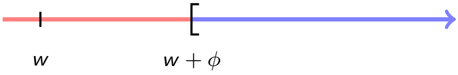
- Recent minimum wage hikes: state, county, and city-level
  - Federal: $7.25
  - California: $15
  - New York City, Seattle: $15
- This paper: identify a novel workers' response to the minimum wage
  - Occupational mobility
- What is the effect of minimum wage changes on occupational mobility?
- To what extent does the mobility response affect
  - Occupational mismatch?
  - Aggregate output?

What I Do

- A search-and-matching model with heterogeneous occupations and workers
- Minimum wages decrease occupational mobility by two channels
  1. Employment effect:
     - Decrease vacancy posting
  2. Wage compression effect:
     - Reduce the wage gap between mismatches and good matches

The Wage Compression Channel

- Switching cost ϕ
- Worker's wage: w
- Minimum wage: $m < w$
- A worker would switch if the other occupation pays $w + \phi$
- A minimum wage increase: $m \uparrow m' > w$
- The worker would switch if the other occupation pays $m' + \phi$
  - Do not switch to occupations paying $[w + \phi, m' + \phi)$ after the increase



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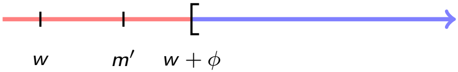

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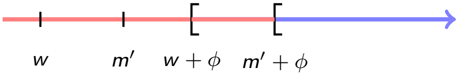

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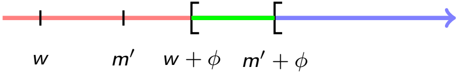

What I Do Cont.

- The implication of the wage compression channel:
  - Minimum wages increase mismatch
  - Decrease output
- Empirical evidence:
  - Minimum wages decrease mobility of younger, less-educated workers
    - 10% increase in minimum wage → 3% decrease in occupational mobility
  - Minimum wages associated with more mismatch
    - 10% increase in minimum wage → 0.1 standard deviation increase in mismatch
- Model: a $15 minimum wage increase from $7.25
  - Decrease occupational mobility by 44%
  - Reduce aggregate output by 0.4%
    - The wage compression channel accounts for 80%

Related Literature

- Price control and search behavior: Fershtman et al. (1994)
- Search-and-matching model: Moscarini (2005), Flinn (2006)
- Mismatch and occupational mobility: Guvenen et al. (2018)
- The minimum wage and job tenure: Dube et al. (2007), Dube et al. (2016), Jardim et al. (2018)

Overview

Model

Model

- Continuous time searching-and-matching model
- Model features:
  - Continuum of occupations defined by a vector of skill composition $\boldsymbol{j} \in [0,1]^n$
  - Heterogeneous workers defined by a vector of ability to learn those skills $\boldsymbol{a}$
  - Mismatch defined as $||\boldsymbol{a} - \boldsymbol{j}||$
- Example: Two dimensions
  - (Verbal, Social)
- Food Server: $(0.3, 0.6)$
- Office Clerk: $(0.7, 0.4)$
- A $(0.5, 0.9)$ worker has mismatch 0.36 and 0.54

Model Cont.

- Job arrival rate λ, on-the-job search $\alpha\lambda$, determined in equilibrium
- Switching cost ϕ
- Exogenous separation δ
- Wage setting: Nash bargaining
  - Worker's bargaining power β
  - Constrained by the minimum wage m
- Firm free entry with flow cost of vacancy κ

Model Cont.

- Worker's match-specific productivity:

$$\frac{dX_t}{X_t} = \tilde{a}dt + \sigma dZ_t$$

- $\tilde{a}$ determines the evolution of worker's productivity
  - Function of occupation's skill composition and worker's ability to learn
    - Decreases in mismatch $||\boldsymbol{a} - \boldsymbol{j}||$
    - Increases in ability $||\boldsymbol{a}||$
- Normalize productivity to map one-to-one to output

Equilibrium

Worker's Problem

- Fix $(\boldsymbol{a}, \boldsymbol{j})$
- Initial output at new occupation: x_p
- Value of unemployment U, wage payment $\widetilde{w} = \max\{w, \text{minimum wage}\}$
- Worker's value function:

$$rV(x) = \widetilde{w} + \tilde{a}xV'(x) + \frac{1}{2}\sigma^2 x^2 V''(x) - \delta[V(x) - U] + \alpha\lambda \max\left\{\int V(x_p, \boldsymbol{j})d\boldsymbol{j} - \phi - V(x), 0\right\}$$

- Unemployed worker:

$$rU = b + \lambda\left[\int V(x_p, \boldsymbol{j})d\boldsymbol{j} - U\right]$$

Worker's Problem Cont.

- Define $x_s : V(x_s) = \int V(x_p, \boldsymbol{j}) d\boldsymbol{j} - \phi$
  - On the job search cutoff
- Define $\underline{x} : V(\underline{x}) = U$
  - Endogenous separation cutoff
- Worker behavior:
  - Search on the job if $\underline{x} < X(t) < x_s$
  - Quit to unemployment if $X(t) \leqslant \underline{x}$

Worker's Problem Cont.

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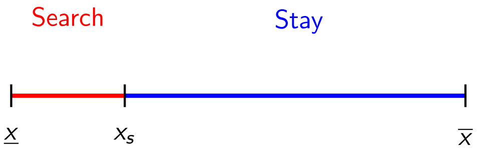


Firm's Problem

- Firms post vacancies at cost κ
- Occupation and worker type determined by joint distribution
- A matching function $m(s, v) = s^{\zeta} v^{1-\zeta}$, $\zeta \in (0, 1)$
  - Firms meet worker at rate $\lambda^{\frac{\zeta}{\zeta-1}}$
- Firm's value function J. Firm free entry implies:

$$\kappa = \int \int \lambda^{\frac{\zeta}{\zeta-1}} J(a, j, m) dadj$$

Equilibrium

Definition

A stationary equilibrium is

- A collection of value functions $\{V, J, U\}_{(\mathbf{a},\mathbf{j})}$ as a fixed point
- A collection of stationary wage distributions $\{f\}_{(\mathbf{a},\mathbf{j})}$
- A list of parameters $\{\delta, \lambda, \beta, \kappa, \alpha, \sigma, \zeta\}$

Proposition

A collection of value functions $\{V, J, U\}_{(\mathbf{a},\mathbf{j})}$ as a fixed point exists. proof

Proposition

A stationary equilibrium exists. proof

Stationary Wage Distribution

- The stationary wage distribution can be derived from a forward equation detail

$$f(x) = \begin{cases} C_0 x^{\eta_0}, & \underline{x} < x \leqslant x_s, \quad \eta_0 > 0 \\ C_1 x^{\eta_1}, & x_s < x < \overline{x}, \quad \eta_1 < 0 \end{cases}$$

- Right Pareto tail η_1 is increasing in ability $||\boldsymbol{a}||$

The Effect of Minimum Wage

Minimum Wage and Occupational Mobility

- Occupational mobility rate: $(\alpha\lambda) \bullet$ (measure of on-the-job search)

$$\mu = \alpha\lambda \int \int \int_{\underline{x}}^{x_s} f(x, a, j, m) dxdadj$$

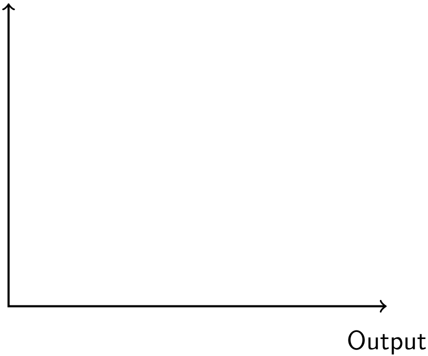
- Minimum wage decreases occupational mobility by two channels
  1. Employment effect:
     - Decrease vacancy posting hence job arrival rate

$$\kappa = \int \int \lambda^{\frac{\zeta}{\zeta-1}} J(a, j, m) dadj$$

     - Increase endogenous separation detail
- Affects all workers regardless of ability and mismatch

Minimum Wage and Occupational Mobility Cont.

2. Wage compression effect:
   - Narrow the wage gap between mismatch and better matched occupations
   - More relevant for low-ability, mismatched workers



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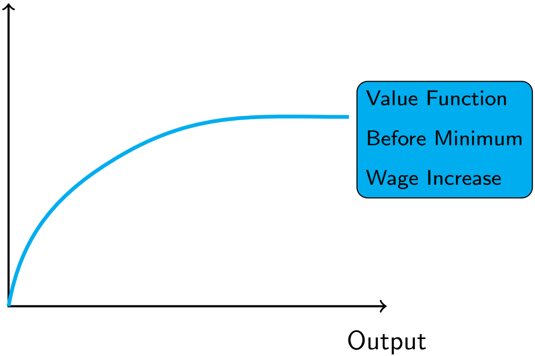

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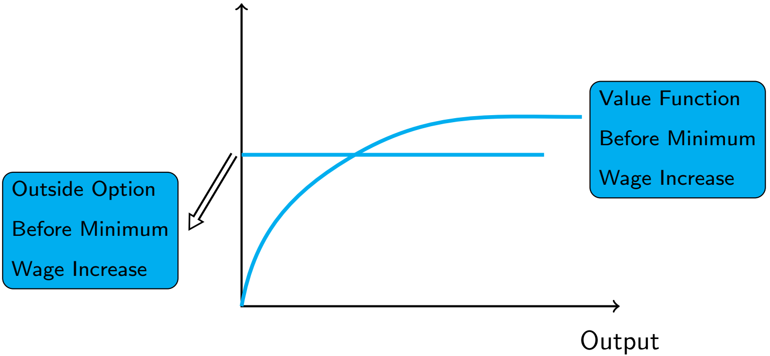

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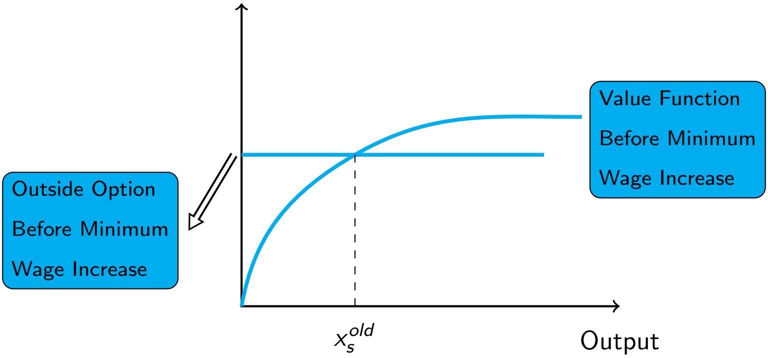

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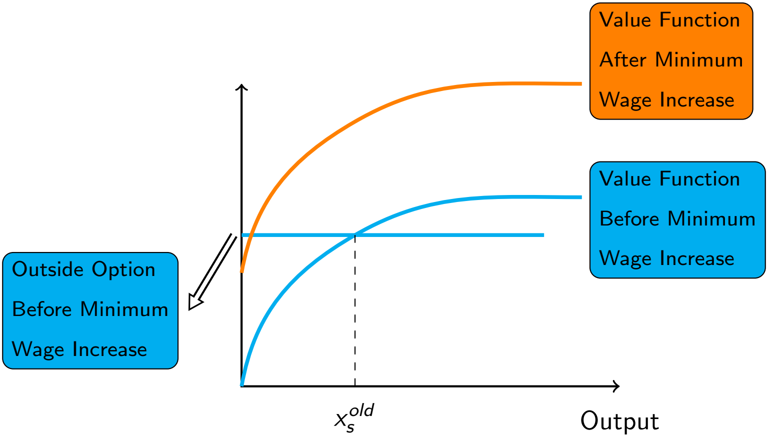

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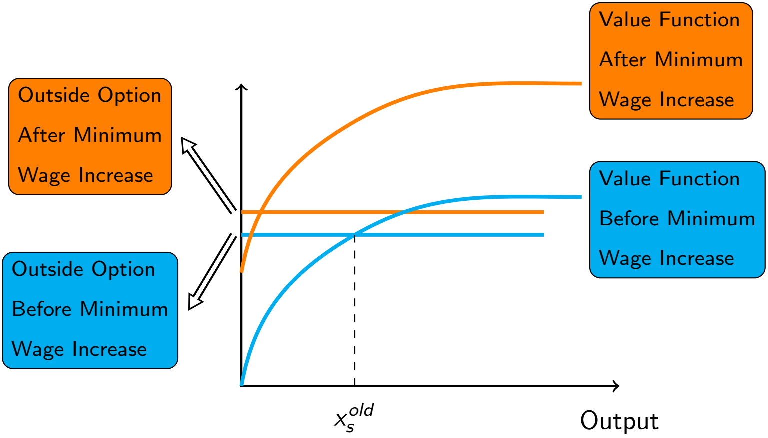

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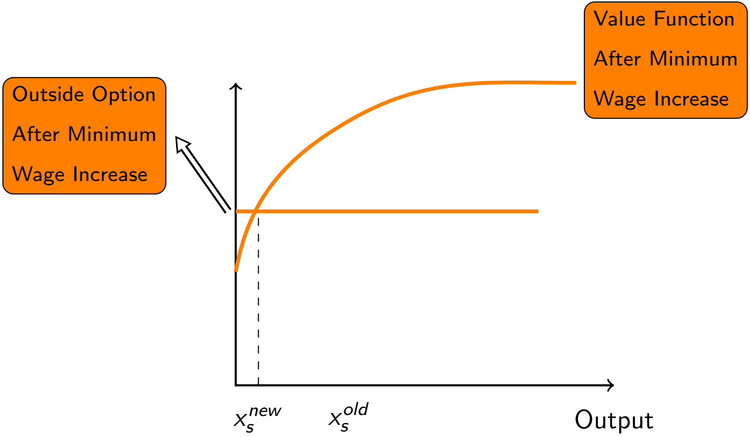

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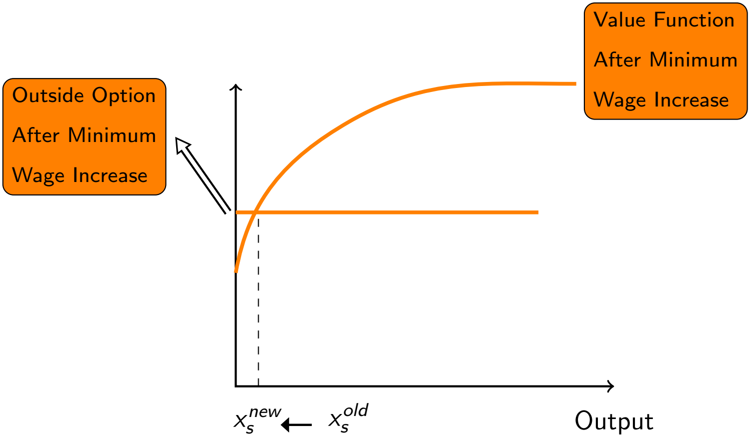


Minimum Wage and Low Ability, Mismatched Workers

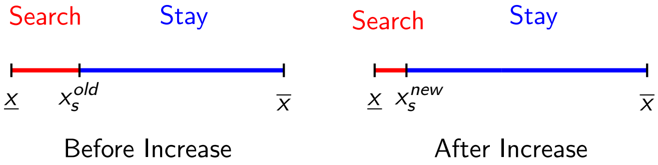


Figure: Low Ability, Mismatched Workers' Search Decision

- Workers between x_s^{new} and x_s^{old} stop searching on the job
- Implication: minimum wages lead to more mismatch

Empirical Evidence

Occupational Mobility Measure

- Data: CPS 2008 to 2016
- An occupational switch is identified if a worker
  1. Employed in both months
  2. Different 4-digit level occupational code across months
  3. Employer switch in the second month
- An occupational stayer is identified if a worker
  1. Employed in both months
  2. Same 4-digit level occupational code across months
  3. Non-empty employer switching response in the second month
- State-level monthly occupational mobility rate $\left(\frac{\text{switcher}}{\text{switcher}+\text{stayer}}\right)_{st}$

Empirical Specification

- Two-way fixed effect regression:

$$\left(\frac{\text{switcher}}{\text{switcher} + \text{stayer}}\right)_{st} = \alpha + \beta log(MW)_{st} + \delta_t + \lambda_s + \Gamma X_{st} + \epsilon_{st}$$

  - $log(MW)_{st}$: log real minimum wage in state s, year-month t
  - δ_t: year-month fixed effect
  - λ_s: state fixed effect
  - X_{st}: manufacturing and retail employment share in state s, year-month t

- Identification:
  - State minimum wages exogenous conditional on fixed effects and covariates

$$\mathbb{E}(\epsilon_{st} | log(MW)_{st}, \delta_t, \lambda_s, X_{st}) = 0$$

  - Conditional expectation is linear

$$\mathbb{E}(Y_{st} | log(MW)_{st}, \delta_t, \lambda_s, X_{st}) = \alpha + \beta log(MW)_{st} + \delta_t + \lambda_s + \Gamma X_{st}$$

Result

	(1) Age 16-30	(2) Age 30-45	(3) High School	(4) College	(5) 5 Lowest-Wage Occupations	(6) 5 Highest-Wage Occupations	(7) Age 16-30 × High School
$lnMW_t$	-0.015***	-0.0015	-0.0077**	0.0014	-0.009***	0.001	-0.019**
	(0.0040)	(0.0031)	(0.0038)	(0.0035)	(0.0031)	(0.0041)	(0.0071)
N	5508	5508	5508	5508	5508	5508	5508
Outcome Mean	2.1%	1.0%	1.3%	1.0%	1.4%	0.9%	2.2%
R-square	0.12	0.07	0.12	0.06	0.10	0.05	0.09

- A 10% minimum wage increase
  - Decreases younger, less-educated workers' occupational mobility by 3%
  - No significant effect on older, more-educated workers

Robustness

1. Placebo test
2. Add state-specific time trend
3. Alternative control groups using GSC
4. Use different sample period
5. Measurement
    5.1 Regression on employer-only switchers
    5.2 Different measure independent of employer switching
6. Regression on controls

detail

Detail Transition Matrix

- Which occupational transitions are most affected?
- Aggregate occupations into four categories detail
  - Non-routine cognitive (e.g. lawyer)
  - Non-routine manual (e.g. food server)
  - Routine cognitive (e.g. office clerk)
  - Routine manual (e.g. maintenance)
- Construct transition rates at state-level, annual frequency
- Two-way fixed effect regression:

$$\left(\frac{\text{switcher}}{\text{switcher} + \text{stayer}}\right)_{st} = \alpha + \beta log(MW)_{st} + \delta_t + \lambda_s + \epsilon_{st}$$

- Negative impact:

  non-routine manual (e.g. food server)

  $\rightarrow$ routine cognitive (e.g. office clerk)
  - A 10% increase in minimum wage $\rightarrow$ 4% decrease in the transition rate

Minimum Wage and Mismatch

- Use data from Guvenen et al. (2018)
  - Occupation skill composition from O*NET detail
  - Ability to learn from NLSY79 ASVAB test scores
  - Mismatch: Euclidean distance

Minimum Wage and Mismatch Cont.

- Two-way fixed effect regression:

$$Mismatch_{irt} = \alpha + \beta lnMW_{rt} + X'_{irt}\gamma + \delta_t + \lambda_r + \epsilon_{irt}$$

  - $lnMW_{rt}$: log real average minimum wage in region r, year t
  - X_{irt}: age, race, education, gender, ability
  - δ_t: year fixed effect
  - λ_r: regional fixed effect
- Restrict sample to white and Hispanic workers
- Identification:
  - Regional average minimum wages exogenous conditional on covariates

$$\mathbb{E}(\epsilon_{irt}|log(MW)_{rt}, \delta_t, \lambda_r, X_{irt}) = 0$$

  - Conditional expectation is linear

$$\mathbb{E}(Y_{irt}|log(MW)_{rt}, \delta_t, \lambda_r, X_{irt}) = \alpha + \beta log(MW)_{rt} + \delta_t + \lambda_s + \Gamma X_{irt}$$

Results

	(1) Age 16-30 × High School	(2) Age 30-45
$lnMW_{rt}$	1.06*	0.21
	(0.37)	(0.41)
Ability	1.10***	-0.01
	(0.12)	(0.18)
Region FE	Y	Y
Year FE	Y	Y
N	13723	21356
R-squared	0.07	0.02

- A 10% increase in minimum wage → 0.1 std increase in mismatch

Quantitative Analysis

Quantitative Analysis

- Estimate the model using Generalized Method of Moments (GMM)
  - Moment targets based on empirical results
- Simplify ability and occupational skill composition to one dimension
- Discretize ability and occupational skill composition into ten grids
- Worker ability distribution $Beta(k_1, k_2)$
- Ability:
  - Low ability: grids 1 to 4 $\implies$ high school (42.3%)
  - Medium ability: grids 5 to 7 $\implies$ associate and some college (28.6%)
  - High ability: grids 8 to 10 $\implies$ college (29.1%)
- k_1 and k_2 is set to match the education composition

Quantitative Analysis Cont.

- Worker can target their search:
  - Match to optimal occupation w.p. ρ
  - Equal probability to match to other occupations $\frac{1-\rho}{9}$
  - Implicitly determines joint distribution of ability and occupation
- Taylor expansion on the job search threshold:

$$x_s(a, m) = s_0 + s_1 a + s_2 m \mathbb{I}_{(a<qm)}$$

- Taylor expansion on the endogenous separation threshold:

$$\underline{x}(a, m) = p_0 + p_1 a + p_2 m$$

Quantitative Analysis Cont.

- Discretize output process using the Euler-Maruyama approximation:

$$X_{t+1} = X_t + \tilde{a} X_t \Delta_t + \sigma X_t \mathbb{N} \sqrt{\Delta_t}$$

- Functional form of the drift:

$$\tilde{a} = \frac{a}{1 + |a - j|}$$

Moment Targets and Results

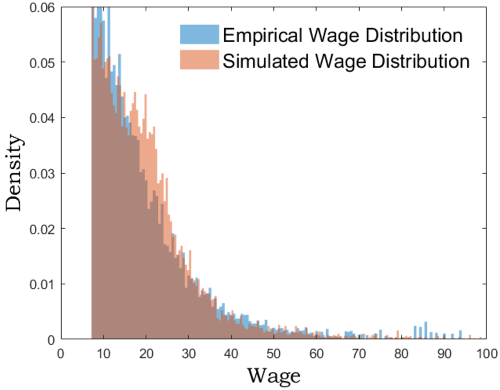
- 20 moment targets and 10 parameters
- Parameter estimation results:

Parameters							
ρ	0.498**	s_0	1.05**	s_1	-0.2**	s_2	-0.009**
	(0.235)		(0.031)		(0.041)		(0.001)
σ	0.72**	p_0	0.65	p_1	-0.55	p_2	0.008**
	(0.262)		(1.347)		(0.363)		(0.001)
λ'	0.355**	q	0.028**				
	(0.006)		(0.001)				

Model Fit

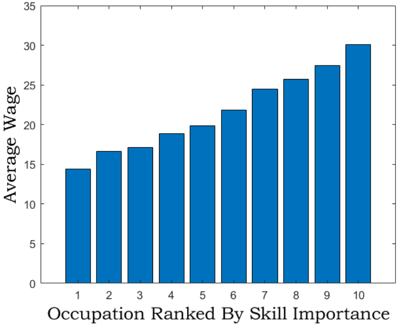
Targets	Data	Model Estimates
Wage gain (Guvenen et al. (2018))	1%	1.6%
Separation rate, low ability workers (CPS)	7.5%	5.3%
Separation rate, mid ability workers (CPS)	6.2%	5%
Separation rate, high ability workers (CPS)	3.6%	3.6%
Fraction of workers earning less than $7.25 (CPS)	5%	4.6%
Fraction of workers earning less than $15 (CPS)	40%	41%
Occupational mobility, low ability workers (CPS)	2.6%	3.8%
Occupational mobility, mid ability workers (CPS)	1.5%	1.9%
Occupational mobility, high ability workers (CPS)	1.1%	1%
Elasticity of occupational mobility, low ability workers (This paper)	-0.3	-0.3
Elasticity of occupational mobility, mid ability workers (This paper)	0	-0.1
Elasticity of occupational mobility, high ability workers (This paper)	0	0
Elasticity of employment, low ability workers (Neumark et al. (2004))	-0.1	-0.1
Elasticity of employment, mid ability workers (Neumark et al. (2004))	0	0
Elasticity of employment, high ability workers (Neumark et al. (2004))	0	0
P20/P10 (CPS)	1.21	1.24
P30/P10 (CPS)	1.46	1.47
P40/P10 (CPS)	1.75	1.73
P50/P10 (CPS)	2.06	2.02
Variance to mean ratio (CPS)	13	13

Simulated Wage Distribution



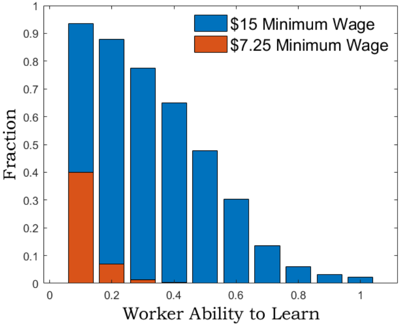
Average Wage

(a) By Ability



(b) By Occupation

Workers with a Binding Minimum Wage



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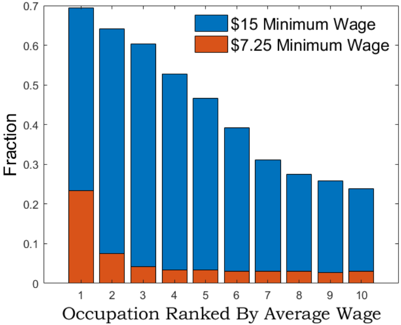
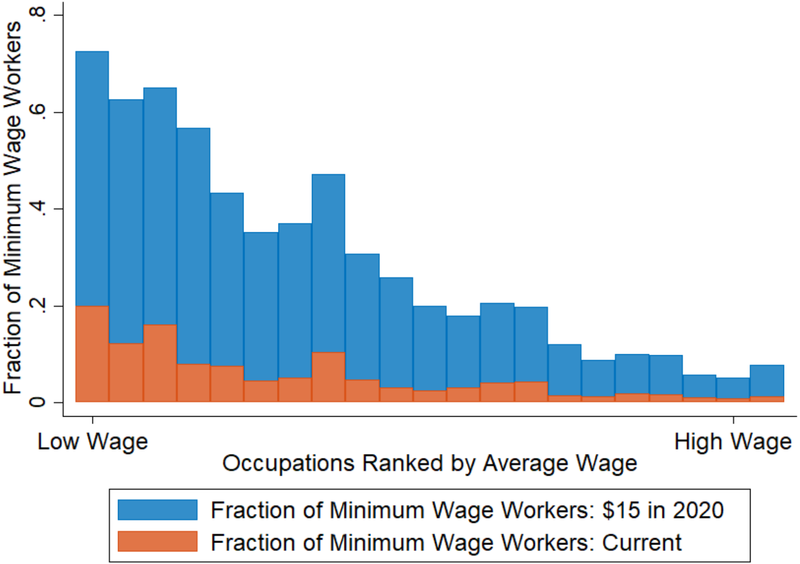


(b) By Occupation

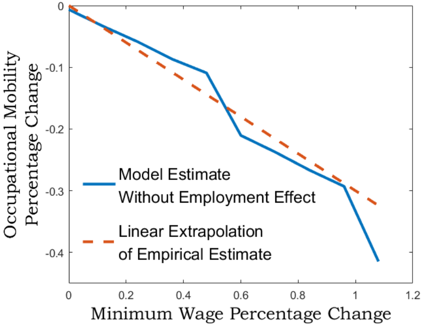
Workers with a Binding Minimum Wage Cont.



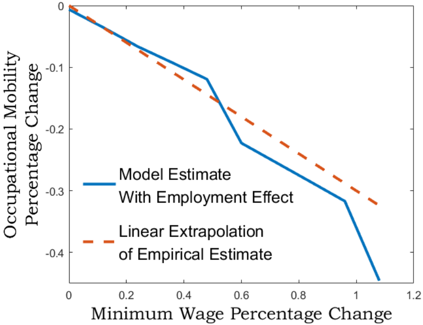
Effect of Minimum Wage on Occupational Mobility

- Increase minimum wage from \$7.25 to \$15:
  - Occupational mobility of low ability workers decreases by 44%
  - No significant effect on high ability workers
- Effect displays non-linearity
  - Intuition: fraction of workers affected by minimum wage highly non-linear

Effect of Minimum Wage on Occupational Mobility Cont.



(a) No Employment Effect



(b) With Employment Effect

Mismatch and Aggregate Output

- The minimum wage increase leads to more mismatch
  - Low ability workers are 2% more likely to be in mismatch
- Aggregate output reduction
  - Overall: 0.4% decrease
  - Low ability workers: 1.3% decrease
- The wage compression channel accounts for 80%

Conclusion

Conclusion

- A search-and-matching model with heterogeneous occupations and workers:
  - Minimum wage decreases occupational mobility by
    - Employment effect channel
    - Wage compression channel
- Empirical evidence:
  - Minimum wages decrease mobility of younger, less-educated workers
  - Minimum wages associated with more mismatch
- Quantitative results:
  - $15 minimum wage decreases aggregate output by 0.4%
  - 80% comes from the wage compression channel
- Policy implication of a large minimum wage increase:
  - Can damp aggregate output by increasing mismatch

Appendix

Placebo Test

- Dube et al. (2010)
  - Assign state minimum wage to neighbor state with federal minimum wage
  - Without spatial correlation, should see no effect using two-way FE
- We follow the idea:
  - Separate states into two groups
    - Frequent minimum wage changers (change $\geqslant 5$): 18 states
    - Infrequent minimum wage changers: other states
  - Assign minimum wage policy of frequent changers to infrequent changers
  - Regress outcomes only in infrequent changers
- Only 6% out of 500 permutations significant using two-way FE
- Conclusion:
  - Infrequent changers are valid control groups in this context

back

State-Specific Time Trend

- Adding state-specific time trends:

	(1) Age 16-30	(2) Age 30-45	(3) High School	(4) College	(5) 5 Lowest-Wage Occupations	(6) 5 Highest-Wage Occupations	(7) Young × High School
				With State-Specific Time Trends			
$lnMW_t$	-0.013***	-0.0007	-0.0061	0.0020	-0.011***	0.0001	-0.016**
	(0.0046)	(0.0030)	(0.0045)	(0.0030)	(0.0037)	(0.005)	(0.0080)
N	5508	5508	5508	5508	5508	5508	5508
R-square	0.13	0.08	0.13	0.07	0.11	0.06	0.10

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Different Sample Periods

- Different sample periods

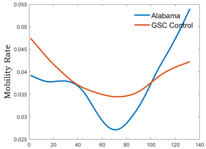
	(1) Age 16-30	(2) Age 30-45	(3) High School	(4) College	(5) 5 Lowest-Wage Occupations	(6) 5 Highest-Wage Occupations	(7) Young × High School
				2004 to 2016 (N = 7956)			
$lnMW_t$	-0.009***	0.0003	-0.002	0.0004	-0.0030	-0.0007	-0.0070
	(0.0032)	(0.002)	(0.0025)	(0.0019)	(0.0021)	(0.0023)	(0.0046)
				2006 to 2016 (N = 6732)			
$lnMW_t$	-0.011***	-0.001	0.0047*	0.0009	-0.006**	0.0003	-0.011**
	(0.003)	(0.002)	(0.0025)	(0.0022)	(0.0023)	(0.0028)	(0.0046)
				2010 to 2016 (N = 4284)			
$lnMW_t$	-0.017***	-0.0028	-0.0096*	0.0006	-0.010***	-0.0007	-0.023**
	(0.005)	(0.0034)	(0.0048)	(0.0039)	(0.003)	(0.0044)	(0.0095)
				2012 to 2016 (N = 3060)			
$lnMW_t$	-0.017***	-0.001	-0.0060	0.0012	-0.0073*	0.0020	-0.020*
	(0.006)	(0.0044)	(0.0053)	(0.0040)	(0.0037)	(0.0053)	(0.0107)
State&Year FE	Y	Y	Y	Y	Y	Y	Y

Alternative Control Groups

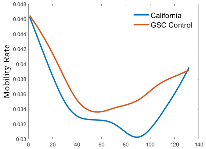
- Time fixed effect
  - Subtract off mean value of all variables
  - Give *equal* weight to each state
- An alternative method:
  - Generalized synthetic control (GSC) by Powell (2016)
- Compared to two-way FE model
  - Average correlation increases from 0.5 to 0.75
- Same result for younger, less-educated workers

back

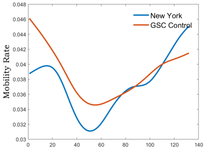
GSC Correlation Plots



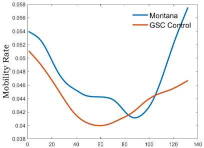
(a) Alabama



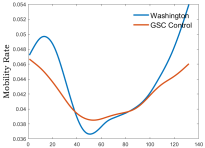
(b) California



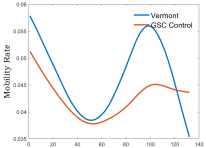
(c) New York



(d) Montana



(e) Washington



(f) Vermont

Figure: GSC Fit: Frequent Minimum Change States

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Measurement

- Focus on employer-only switch
  - Employer switch without occupational switch
  - If effect only on job switching, expect the result to be negative

	(1) Age 16-30	(2) High School	(3) 5 Lowest Wage Occupations	(4) Age 16-30 × High School
	Employer Switching without Occupational Switching			
$lnMW_t$	0.0125	0.0119	0.0327	-0.0105
	(0.0215)	(0.0098)	(0.0226)	(0.0095)
N	5508	5508	5508	5508
R-square	0.61	0.69	0.69	0.33

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Micro-level Data Analysis

- Use micro-level data and identify occupational switch by two criterion
  - Employer switch
  - Usual occupational activity change
- The second criterion independent of employer switch
- Regression specification:

$$\text{Occupational Switch}_{ist} = \alpha + \beta \log(\text{Minwage})_{st} + \delta_t + \lambda_s + \tau_s * t + \Gamma X_i + \Omega Y_{st} + \epsilon_{ist}$$

- Result

	(1) Employer Switch	(2) Usual Activity Change
	No State-Specific Time Trends	
$lnMW_t$	-0.038**	-0.014*
	(0.016)	(0.008)
	With State-Specific Time Trends	
$lnMW_t$	-0.021	-0.014
	(0.019)	(0.0092)
Observations	N = 59632	N = 58917

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Regression on Controls

	(1) Manufacturing Employment	(2) Retail Employment
$lmMW_t$	0.0009	0.0014
	(0.005)	(0.004)
Observations	5508	5508
R-squared	0.9889	0.9867
State FE	Y	Y
Year FE	Y	Y

back

Detail Transition Matrix Construction

- Occupational mobility defined as in the main regression
- Aggregate transition rates: four categories at state-level, annual frequency
  - Food server → office clerk: non-routine manual → routine cognitive
  - Food server → food server: stayer
  - Food server → bartender: non-routine manual → non-routine manual

From \ To	Non-Routine Cognitive	Non-Routine Manual	Routine Cognitive	Routine Manual
Non-Routine Cognitive	-0.007	0.005	-0.001	0.009
	(0.006)	(0.008)	(0.012)	(0.007)
Non-Routine Manual	0.002	0.006	-0.011*	-0.003
	(0.003)	(0.006)	(0.006)	(0.005)
Routine Cognitive	-0.003	0.004	-0.004	-0.004
	(0.003)	(0.004)	(0.005)	(0.005)
Routine Manual	0.001	0.005	0.002	-0.011
	(0.003)	(0.003)	(0.005)	(0.009)
Observations	663	663	663	663
State FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

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Existence of a System of Equations as a Fixed Point

- **Assumption:** The joint CDF $N(\boldsymbol{a}, \boldsymbol{j})$ has a continuous pdf $n(\boldsymbol{a}, \boldsymbol{j})$.
- Under this assumption, we can show that
  - The system can be formulated as a linear operator
  - This operator is compact
  - There exist eigen-functions which serve as the fixed point of the system
  - Conclusion: the system of equations has a solution

back

Existence of Stationary Equilibrium

- Define matching function: $m(s, v) = s^{\zeta} v^{1-\zeta}$
- $\lambda = m(s, v)/s = \theta^{1-\zeta}$ is the job finding rate
- Free entry of firm with vacancy cost κ:

$$\kappa = \int \int \lambda^{\frac{\zeta}{\zeta-1}} J(x_a, a, j) dadj \tag{1}$$

- A stationary general equilibrium: $\{\lambda, s, v, \{\underline{x}\}, \{x_a\}\}$ and $\{\{J\}, \{V\}, \{f\}\}$
- J is bounded in $[J(\underline{x}, 0, 1), J(\overline{x}, 1, 1)]$. This means $\exists \lambda$ such that equation (1) holds

back to proposition

Stationary Distribution

- Stationary output distribution Fokker-Planck equation:

$$\frac{\sigma^2}{2}x^2 f''(x) + (2\sigma^2 - \tilde{a}^2)xf'(x) + (\sigma^2 - \tilde{a})f(x) - (\delta + \alpha\lambda\mathbb{I}_{\{x<x_a\}})f(x) = 0$$

- Boundary conditions
  - $f(\underline{x}+) = 0$: endogenous separation
  - $(\tilde{a} - \sigma^2)f(\overline{x}) = \frac{1}{2}\sigma^2\overline{x}f'(\overline{x})$: reflection at upper-bound
  - Total flow in and out of unemployment constant
  - Total flow in and out of employment (a, j) constant

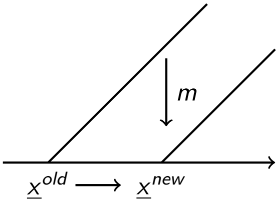
back

Firm's Value Function

- The value function $J(x)$ is log concave and has the form:

$$J(x) = \begin{cases} C_0^0 x^{\gamma_0^0} + C_1^0 x^{\gamma_1^0} - A(x,m), & \text{if } \underline{x} \leqslant x \leqslant x_s \\ C_0^1 x^{\gamma_0^1} + C_1^1 x^{\gamma_1^1} - B(x,m), & \text{if } x > x_s \end{cases}$$

- Endogenous separation cutoff is determined by $J(\underline{x}) = 0$.
- Since J is decreasing in minimum wage, $\underline{x}$ is increasing in m



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O*Net Data Detail

- Office Clerk:

Skills Save Table (XLS/CSV)

10 of 35 displayed (9 important)

Importance	Skill
69	**Active Listening** — Giving fu questions as appropriate, and
69	**Reading Comprehension** —
66	**Speaking** — Talking to others
53	**Writing** — Communicating eff
50	**Coordination** — Adjusting ac
50	**Critical Thinking** — Using log approaches to problems.
50	**Service Orientation** — Active
50	**Social Perceptiveness** — Be
50	**Time Management** — Manag
47	**Monitoring** — Monitoring/Ass action.

O*Net Data Detail

- Food Server:

Skills Save Table (XLS/CSV)

10 of 35 displayed (6 important)

Importance	Skill
56	**Active Listening** — Giving full atten questions as appropriate, and not int
56	**Service Orientation** — Actively look
53	**Speaking** — Talking to others to cor
50	**Coordination** — Adjusting actions ir
50	**Monitoring** — Monitoring/Assessing action.
50	**Social Perceptiveness** — Being aw
47	**Judgment and Decision Making** —
44	**Critical Thinking** — Using logic and approaches to problems.
44	**Instructing** — Teaching others how
41	**Learning Strategies** — Selecting ar teaching new things.

back

4-Digit Census 02 Occupation Codes

General and operations managers	Advertising and promotions managers
Credit analysts	Financial analysts
Computer programmers	Computer software engineers
Biomedical engineers	Chemical engineers
Economists	Market and survey researchers
Elementary and middle school teachers	Secondary school teachers
Technical writers	Writers and authors
Chefs and head cooks	Cooks
Advertising sales agents	Retail sales agents
Bus drivers	Taxi drivers and chauffeurs

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Details of Occupational Mobility Construction

- An occupation switcher is identified if
  - employed in both months
  - occupational code differs in two months
  - dependent coding
    1. employer change? (preferred measure)
    2. job usual activity and duty change?
    3. occupation and usual activity change?
- Collapse to obtain the mobility rate with final weight

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