

Minimum Wage Increases and Vacancies

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Disclaimer: The views expressed in this paper are those of the authors' and they do not necessarily reflect the views of the Cleveland Fed, San Francisco Fed, Kansas City Fed, or the Federal Reserve System.

Motivation

- The existing vast literature has mainly focused on the question of whether a higher minimum wage reduces employment – the debate remains intense and unsettled.
- The employment effect depends on adjustments in both hirings and separations.
- In this paper, we are focusing on changes in firms' vacancy posting as they adjust hiring in response to minimum wage increases.
- A higher minimum wage increases the cost of labor and theory would predict a reduction in vacancies for jobs paying wages close to the minimum wage.
- Question: What is the relative effect of minimum wage increases on vacancies for “at-risk” occupations compared to others?

Relation to the Existing Empirical Literature

- Vacancies versus employment
- We are searching for a “causal” and “relative” effect of minimum wage increases on the vacancies for occupations that are most likely to be impacted.
 - The literature has mainly focused on the employment effects of minimum wage increases for specific narrow groups.
 - Teen employment: Card (1992), Neumark and Wascher (1992), Allegretto et al. (2017).
 - Employment in specific sectors: Katz and Krueger (1992), Card and Krueger (1994), Dube, Lester, and Reich (2010).

Summary of the Paper

- We use county-level vacancy data by two-digit occupations at a quarterly frequency to estimate the relative elasticity of vacancies for at-risk occupations with respect to minimum wage increases.
- Identification relies on the state-level variation in the minimum wage and occupational exposure to minimum wage hikes.
 - Policy change: minimum wage hike at the state level.
 - Outcome: vacancies at the county level.
 - Not all occupations have a large mass of employed workers earning at or near the minimum wage (i.e. food services versus management).
 - An increase in the binding minimum wage will affect vacancies for at-risk occupations differently from others.

Preview of Results

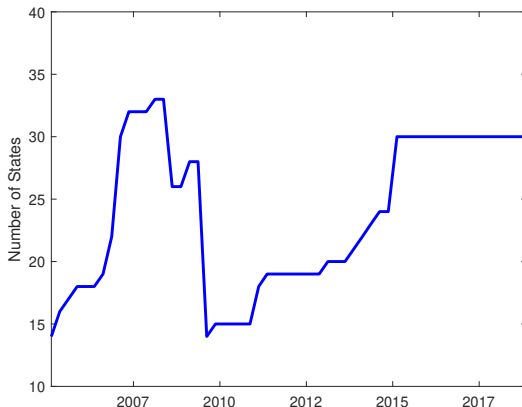
- We find statistically significant negative effects of minimum wage hikes on vacancies for at-risk occupations during 2005Q2-2018Q4.
- On average, a 10 percent increase in the binding minimum wage reduces vacancies for at-risk occupations by 2.4 percent compared to others.
- We find evidence for a preemptive pullback in vacancy posting.
- The negative effect emerges three quarters prior to the effective change.

Constructing the Dataset

State-Level Effective Minimum Wages and Minimum Wage Increases

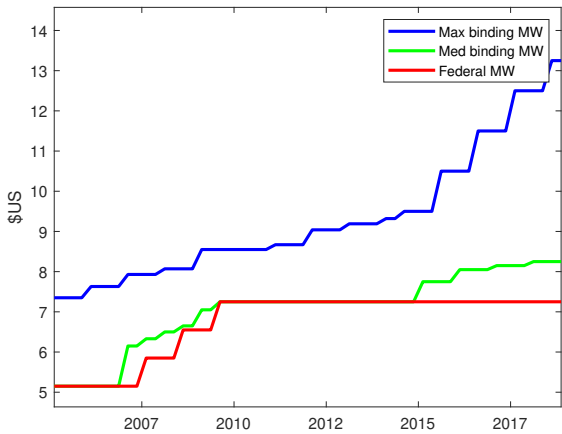
- We use a quarterly data set of state-level effective minimum wages - Vaghul and Zipperer (2016).
- The effective minimum wage for each state and date corresponds to the maximum of the state-level and federal minimum wage.
- The federal minimum wage was \$5.15 per hour in 2005. It rose gradually to \$5.85 in 2007, \$6.55 in 2008, and \$7.25 per hour in 2009.
- During 2005-2018, there were 291 minimum wage hikes, ranging from 0.5 percent to over 34 percent.

Many States Have Binding State-Level Minimum Wages

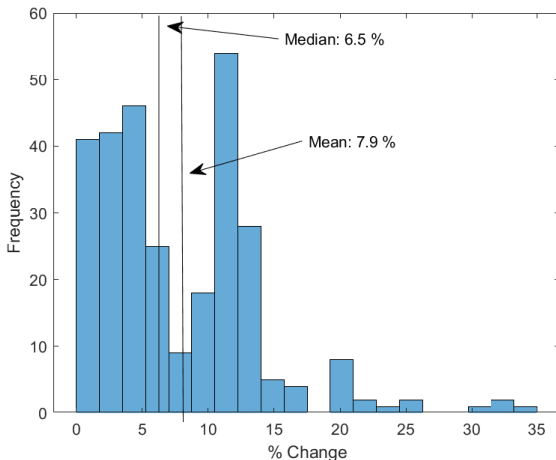


While 14 states had a binding state-level minimum wage in 2005, that number rose to 30 by 2015.

Dispersion in the Effective State-Level Minimum Wages Has Increased Over the Years



Most of the Minimum Wage Increases were below 10%



Distribution of State-Level Minimum Wage Changes: 2005-2018

Vacancies

- We use county-level vacancy data reported by the Conference Board as part of its Help Wanted OnLine (HWOL) data series.
- The HWOL provides data at detailed geographical and occupational levels.
- The HWOL data include the stock of vacancies, as well as flows as new job postings that are less than 30 days-old.
- Sample: 2005Q2-2018Q4 period, covering 3142 counties.

At-Risk Occupations

We define an occupation as “at-risk” if at least 5 percent of the employment share for the occupation earns an hourly wage at or below the 110 percent of the prevailing minimum wage.

- We use the Current Population Survey “outgoing rotation groups” to get wage information by occupation within each state.
- Working individuals of age 16 and above, no self-employed, or working without pay. We use hourly wages when available, otherwise we compute hourly rate using weekly information.
- The designation of an occupation to the at-risk group does not change over time.
- Same occupations are designated as at-risk in all states.

At-Risk Occupations - Summary

Six occupations are in the at-risk group:

- Food Preparation and Servicing Occupations
- Building and Grounds Cleaning and Maintenance Occupations
- Personal Care and Serving Related Occupations
- Transportation and Material Moving Occupations
- Office and Administrative Support Occupations
- Sales and Related Occupations

Empirical Analysis

Empirical Setup

- We run the following panel regression to identify the relative elasticity of vacancies for at-risk occupations to minimum wage hikes at the level of local labor markets :

$$\ln(V_{i,o,t}) = \alpha_{i,o} + \mu_{o,t} + \gamma_{i,t} + \beta \ln(MW_{i,t}) * AtRisk_o + \epsilon_{i,o,t}$$

where, the coefficient of interest is β .

- $\alpha_{i,o}$: county-occupation fixed effects
- $\mu_{o,t}$: occupation-time fixed effects
- $\gamma_{i,t}$: county-time fixed effects

Baseline Estimates

	ln (Total Vacancies)	ln (New Vacancies)
$\ln(\text{MW}_t) * \text{At-Risk}$	-0.241** (0.083)	-0.215** (0.080)
Fixed Effects:		
County x Time	Yes	Yes
County x Occupation	Yes	Yes
Occupation x Time	Yes	Yes
Clusters	51	51
Observations	2,930,908	2,752,397
R-squared	0.921	0.922

Why Do We Use Granular Fixed Effects?

	ln (Total Vacancies)			
	(1)	(2)	(3)	(4)
ln(MW _t)*At-Risk	-0.241*** (0.083)	0.642*** (0.073)	0.226* (0.120)	-0.103 (0.212)
Fixed Effects:				
County x Time	Yes	Yes	Yes	
County x Occupation	Yes	Yes		Yes
Occupation x Time	Yes		Yes	Yes
Clusters	51	51	51	51
Observations	2,930,908	2,930,908	2,931,708	2,932,275
R-squared	0.921	0.913	0.840	0.898

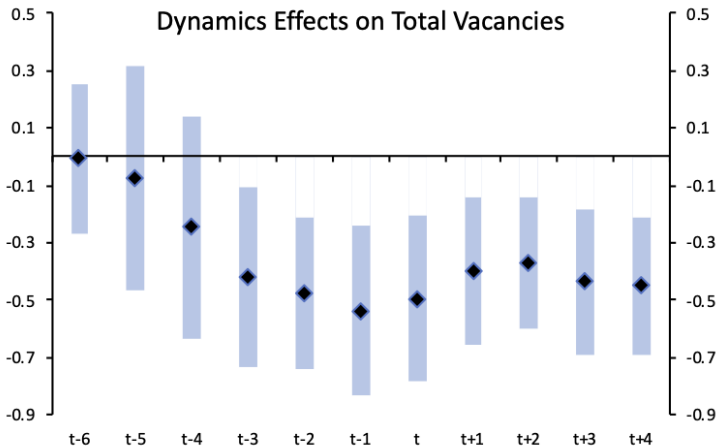
Dynamic Effects

- Is there a forward-looking response in firms' vacancy posting behavior?
- Leung (2021): Mean announcement of a minimum wage hike is around 3.21 quarters before the implementation.

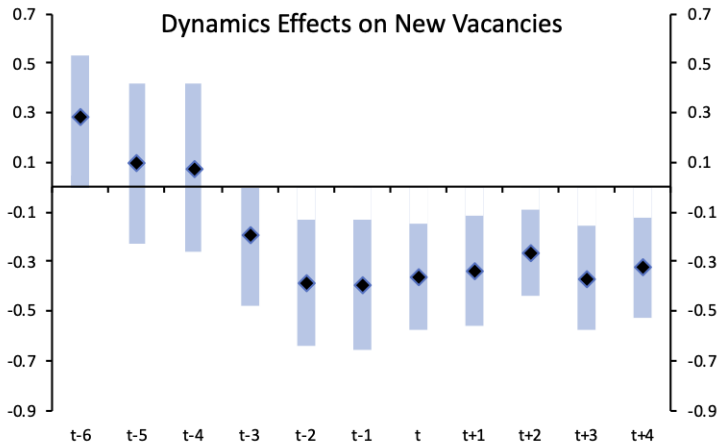
$$\ln(V_{i,o,t}) = \alpha_{i,o} + \mu_{o,t} + \gamma_{i,t} + \sum_{j=-6}^4 \beta_j \ln(MW_{i,t+j}) AtRisk_o + \varepsilon_{i,o,t}$$

- We look at effects of minimum wage hikes up to six quarters prior to and four quarters after the change.
- The cumulative effect of the change at time $t + m$ will be the sum of all β_j 's up to $j = m$.

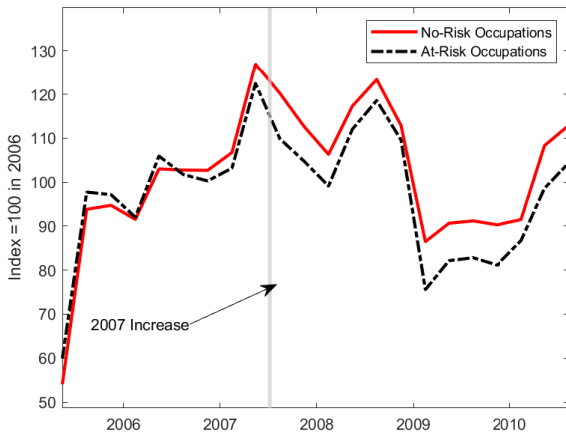
Announcement Effect of 3 Quarters Prior to the Policy Change - Total Vacancies



Similar Announcement Effect for New Vacancies



More on the Parallel Pretrends



Vacancies in 13 states that never had a state-level minimum wage above the federal level throughout the sample period.

Robustness and Discussion

Robustness Checks

1. Alternative control group: contiguous-county design
 - Dube, Lester, and Reich (2010) estimate the impact of minimum wage increases on employment using data for neighbor counties along the state borders.
 - Assumption: unobserved heterogeneity between adjacent border counties may be less pronounced than in average counties in each state.
 2. Changing the threshold value of 5 percent or removing one at-risk occupation group at a time.
 3. Transformation of the vacancy data to handle zeros in the data.
- Our results remain robust through these robustness checks.

Discussion

- We find negative and statistically significant effect of minimum wage increases on vacancy posting for at-risk occupations relative others.
- Disemployment effects? The relative decline in vacancies for at-risk occupations may indicate a decline in employment in at-risk occupations.
- Alternatively, the relative decline in vacancies for at-risk occupations may be consistent with lower turnout, without any disemployment effects.