The Local Aggregate Effects of Minimum Wage Increases

Daniel Cooper, Boston Fed
María Luengo-Prado, Boston Fed
Jonathan Parker, MIT

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Motivation

- Since 2006 the average effective minimum wage across municipalities (states and some cities) in the United States has increased 46 percent.

- 18 states changed their minimum wage (MW) in 2018 after 19 states changed theirs in 2017.

- Renewed debate about the economic effects of MW hikes.

- Most of the debate continues to center around the employment effects of MW increases—see Neumark, Salas, and Wascher (2014); Dube, Lebtser, and Reich (2016); Totty (2017).

- We instead focus on the local equilibrium effect of MW hikes in local labor markets (MSAs) on inflation, consumption, household debt and credit access.

Main Findings

- Inflation increases modestly. 10% higher MW, 0.24 pp higher inflation over two years.

    - More rapid and larger adjustment for food away from home.
    - Price adjustments larger in cities with ex-ante more low-wage workers.

- Gains in real food consumption: Local equilibrium income effects exceed substitution effects.

    - Both for food at home and away from home.
    - In some specifications, we also find an effect for durables.

- On debt, credit appears to be easier to obtain:

    - Auto loans increase with MW hikes, particularly for likely constrained borrowers (subprime and young).
    - Debt levels for individuals with low credit scores decrease; possible debt repayment.
   - Higher success rates on credit applications.

Data

- Data sources:
  - Consumer Price Index (CPI): Bureau of Labor Statistics, MSA-level.
  - Personal Consumption Expenditure (PCE): Bureau of Economic Analysis, state-level.
  - Debt related measures: Federal Reserve Bank of New York Consumer Credit Panel provided by Equifax (CCP), individual level.
  - Minimum Wages: U.S. and state Departments of Labor, and city government websites.

- Unit of analysis: MSAs as defined by the BLS for calculating CPIs.
  - Roughly 50% of U.S. population, nearly all population living in or near cities.
  - A city captures a labor market well.

- Sample period: 1999 – 2017 (due to PCE data availability.)
  - Yearly data to capture medium-term effects.

Cities

Reconciling Different Data Geographies

- We follow BLS' city boundaries for MSAs to construct local-level data.

- For MSAs that span multiple states, we use county-level population (Census) data to calculate the population share belonging to each state in each MSA. We then population weight state-level data.

- For debt data, we aggregate individual-level CCP data to the CPI MSA level.

Minimum Wage Evolution

Minimum Wage Distributions Over Time
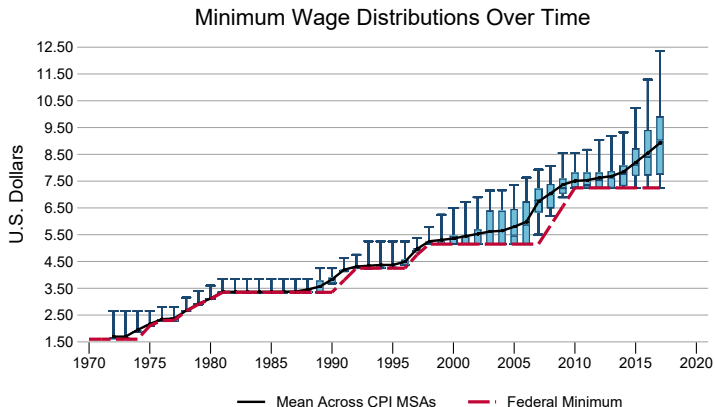
Note: The bars indicate the 25th, 50th, and 75th percentiles of the minimum wage across all 28 CPI MSAs, and the whiskers indicate minimum and maximum values.

Source: Minimum wage data come from Federal and State Departments of Labor and city governments

More

Methodology

We use variation in minimum wages across cities over time:

$$\Delta y_{i,t}^k = \alpha_i + \nu_t + \sum_{j=-J_1}^{J_2} \beta(j)\Delta w_{i,t-j} + \eta\, x_{i,t} + e_{i,t}$$

- i is a city, t is a year.
- $\Delta w_{i,t}$, percent change in minimum wage. $\Delta y_{i,t}^k$, outcome of interest.
- Condition analysis on long-run inflation or growth in each locality by including city fixed effects, α_i.
- Time fixed effects capture macroeconomic trends, ν_t.
- Also condition on local economic conditions ($x_{i,t}$). Bartik-style measure of local employment growth.
- J_1 and J_2 measure leads and lags.
  - Baseline one lag, no leads. We measure medium-term outcomes.
- Standard errors clustered at the city level.

Inflation: MW changes have the most rapid and substantial effect on food away prices

Table 1: Minimum Wage Changes and Inflation

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
Pct. Chg. Min. Wage (t)	0.014	0.013	0.011	−0.003	0.007	0.017	−0.002	0.042***
	(0.008)	(0.009)	(0.011)	(0.011)	(0.006)	(0.013)	(0.011)	(0.011)
Pct. Chg. Min. Wage (t-1)	0.010	0.010	0.010	0.034**	0.011	0.000	0.001	0.011
	(0.011)	(0.010)	(0.012)	(0.015)	(0.013)	(0.015)	(0.012)	(0.014)
Memo:								
Two-year Min. Wage Effect†	0.024	0.022	0.022	0.030	0.018	0.018	−0.001	0.053
P-Value	[0.144]	[0.144]	[0.188]	[0.149]	[0.269]	[0.413]	[0.949]	[0.006]
Observations	528	528	528	528	528	528	528	528
Adjusted R^2	0.680	0.318	0.268	0.450	0.915	0.401	0.736	0.294

Notes: The dependent variable is inflation (price growth) for the CPI category indicated at the top of each column. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Consumption: MW changes have the largest effects on food expenditures

Table 2: Minimum Wage Changes and Real Consumption Growth

	(1) Real PCE	(2) Real Core PCE	(3) Dur	(4) Serv	(5) Food at Home	(6) Food Away
Pct. Chg. Min. Wage (t)	0.008	0.001	0.031	0.003	0.033**	0.052***
	(0.009)	(0.012)	(0.032)	(0.011)	(0.012)	(0.014)
Pct. Chg. Min. Wage (t-1)	−0.017	−0.022**	−0.031	−0.017	0.019	−0.016
	(0.011)	(0.010)	(0.025)	(0.012)	(0.019)	(0.030)
Memo:						
Two-year Min. Wage Effect[†]	−0.008	−0.022	0.000	−0.013	0.051	0.036
P-Value	[0.586]	[0.190]	[0.999]	[0.458]	[0.026]	[0.307]
Observations	528	528	528	528	528	528
Adjusted R^2	0.723	0.725	0.763	0.588	0.458	0.641

Notes: The dependent variable is the percent change in real consumption growth for the expenditure category indicated at the top of each column. [†] Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Discussion

- Real food (away) consumption effects imply (local) income effects dominate substitution effects.
  - A bit at odds with relatively large pass through effects we find of minimum wages to food (away) prices.
  - Plausible to the extent other costs and local outcomes are associated with higher prices.
- Find larger and more significant (real) durable consumption effect when control for the share of low wage workers in a location.

We also study how MW increases affect consumer debt and credit application success rates

- We use consumer debt data (total and auto) from the New York Fed Consumer Credit Panel provided by Equifax (CCP).

- We also use two variables in the CCP to construct a measure of credit availability:
  - Number of inquiries in the past 12 months (initiated by the consumer, multiple inquires in a 30-day period count as one).
  - Number of newly opened accounts in the past 12 months.

- Success rate defined as the **ratio** of the two variables (Amromin, De Nardi, and Schulz, 2017).

- We calculate success rates for different segments of the population based on characteristics reported by Equifax (age and credit score).

Graphs

MW increases, consumer debt and credit success rates

	(1)	(2)	(3)	(4)
	Subprime Individuals			Change
	Total Debt	Auto Debt	Success Rate	Subprime Share
Pct. Chg. Min. Wage (t)	–0.208**	0.094**	0.083**	–0.010*
	(0.075)	(0.042)	(0.035)	(0.005)
Pct. Chg. Min. Wage (t-1)	–0.159*	–0.137*	0.118***	–0.007
	(0.087)	(0.071)	(0.038)	(0.005)
Memo:				
Two-year Min. Wage Effect[†]	–0.367	–0.043	0.201	–0.017
P-Value	[0.023]	[0.602]	[0.006]	[0.066]
Observations	504	504	532	504
Adjusted R^2	0.629	0.738	0.879	0.618

Notes: The dependent variable is noted at the top of each column. [†] Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

- Total debt balances decline (subprime borrowers only).
- Auto loans increase when MWs rise, effect quickly reversed.
- Consumers seem to be more successful with credit applications.

Takeaways

- We focus on the less-studied relationship between MW increases and inflation, consumption growth, household debt, and credit access.

- We find small but significant effects of minimum wage increases on prices (companies at least partially offset higher labor costs by increasing prices) and household spending (households increase the quanity of food they consume).

- We present evidence that minimum wage hikes alleviate borrowing constraints consistent with Dettling and Hsu's (2017) evidence on improved credit scores and access to credit cards.

Extra Slides

CPI cities

(1) Anchorage, (2) Atlanta, (3) Baltimore-Columbia-Towson, (4) Boston-Brockton-Nashua, (5) Chicago-Gary-Kenosha, (6) Cincinnati-Hamilton, (7) Cleveland-Akron, (8) Dallas-Fort Worth, (9) Denver-Boulder-Greeley, (10) Detroit-Ann Arbor-Flint, (11) Honolulu, (12) Houston-Galveston-Brazoria, (13) Kansas City, (14) Los Angeles-Long Beach-Anaheim, (15) Miami-Fort Lauderdale, (16) Milwaukee-Racine, (17) Minneapolis-St. Paul, (18) New York-Northern New Jersey-Long Island, (19) Philadelphia-Wilmington-Atlantic City, (20) Phoenix-Mesa, (21) Pittsburgh, (22) Portland-Salem, (23) San Diego, (24) San Francisco-Oakland-San Jose, (25) Seattle-Tacoma-Bremerton, (26) St. Louis, (27) Tampa-St. Petersburg-Clearwater, and (28) Washington-Arlington-Alexandria.
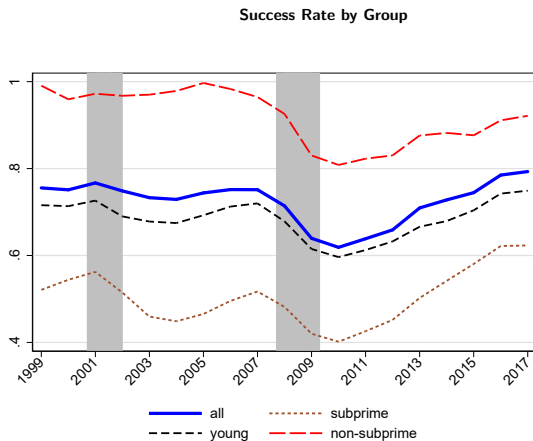
Back

Cities with MW hikes
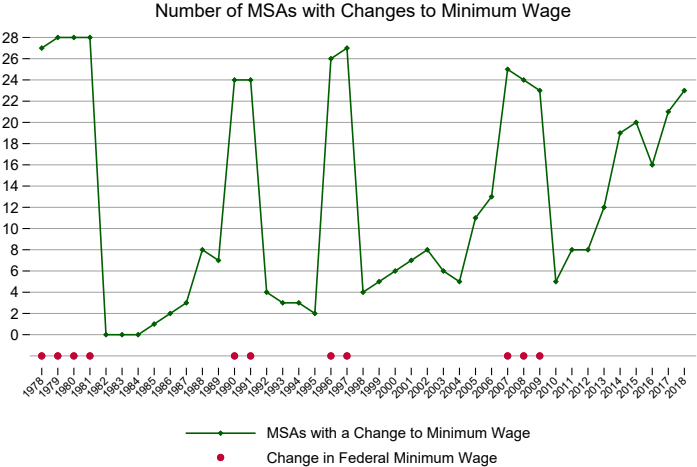
Number of MSAs with Changes to Minimum Wage

Source: Minimum wage data come from Federal and State Departments of Labor and city governments

Success rates over time

Success Rate by Group

Source: Authors' calculations using the NY Fed CCP.

Potential shortcomings

- At the individual level, the measure is not bounded by 1: one recorded inquiry can result in more than one open account; maybe not a problem.

- Potential misrecording of inquiries. An inquiry not initially processed by Equifax that does not result in an open account may not make it into the Equifax inquiries variable:

    - Could be an issue if Equifax's market share in processing inquiries varies greatly over time, or if coordination between the credit bureaus varies with the business cycle.
    - Zero inquiries for an individual could be a real zero or not.

- Even with perfect recording of inquires and open accounts, those who do not apply for credit could still be constrained: they do not apply because they do not think they can get credit.

Debt: Total debt balances decline for subprime borrowers when MWs increase

Table 3: Total Debt and Minimum Wage Changes

	(1) All	(2) Subprime	(3) Young	(4) Subprime and Young
Pct. Chg. Min. Wage (t)	–0.032	–0.208**	0.023	–0.093
	(0.040)	(0.075)	(0.045)	(0.059)
Pct. Chg. Min. Wage (t-1)	–0.040	–0.159*	0.016	–0.031
	(0.035)	(0.087)	(0.051)	(0.059)
Bartik Empl. Growth	–3.084	–2.306	–1.448	–1.784
	(3.429)	(2.550)	(4.102)	(2.794)
Memo:				
Two-year Min. Wage Effect†	–0.072	–0.367	0.039	–0.125
P-Value	[0.242]	[0.023]	[0.608]	[0.243]
Observations	504	504	504	504
Adjusted R^2	0.680	0.629	0.662	0.642

Notes: The dependent variable is the percent change in total debt balances for the borrower group indicated at the top of each column. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Debt: Auto loans increase when MWs rise, effect quickly reversed

Table 4: Auto Debt and Minimum Wage Changes

	(1) All	(2) Subprime	(3) Young	(4) Subprime and Young
Pct. Chg. Min. Wage (t)	0.086**	0.094**	0.094**	0.084*
	(0.038)	(0.042)	(0.037)	(0.046)
Pct. Chg. Min. Wage (t-1)	–0.125*	–0.137*	–0.136*	–0.118
	(0.066)	(0.071)	(0.079)	(0.088)
Bartik Empl. Growth	–1.508	–1.473	–0.536	–0.543
	(3.120)	(2.485)	(3.808)	(3.282)
Memo:				
Two-year Min. Wage Effect[†]	–0.039	–0.043	–0.042	–0.033
P-Value	[0.602]	[0.602]	[0.579]	[0.696]
Observations	504	504	504	504
Adjusted R^2	0.744	0.738	0.733	0.742

Notes: The dependent variable is the percent change in auto loan balances for the borrower group indicated at the top of each column. [†] Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Consumers seem to be more successful with credit applications when MWs rise

Table 5: Success in Credit Applications, the Subprime Share, and MW Changes

	(1)	(2)	(3)	(4)	(5)
		Success Rate			Change
	Total Sample	Subprime	Young	Subprime Young	Subprime Share
Pct. Chg. Min. Wage (t)	0.077*	0.083**	0.112**	0.118***	–0.010*
	(0.039)	(0.035)	(0.042)	(0.041)	(0.005)
Pct. Chg. Min. Wage (t-1)	0.089**	0.118***	0.119**	0.131***	–0.007
	(0.032)	(0.038)	(0.044)	(0.043)	(0.005)
Bartik Emp. Growth	–6.776*	–4.622	–6.667*	–4.309	–0.092
	(3.304)	(2.980)	(3.868)	(3.057)	(0.170)
Memo:					
Two-year Min. Wage Effect†	0.165	0.201	0.231	0.249	–0.017
P-Value	[0.015]	[0.006]	[0.007]	[0.003]	[0.066]
Observations	532	532	532	532	504
Adjusted R^2	0.898	0.879	0.870	0.855	0.618

Notes: The dependent variable is the average credit application success rate for the borrower group indicated at the top of columns 1–4, and the percent change in the share of subprime borrower in column 5. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.