# Now You See It, Now You Don't: Financial Constraints, Minimum Wage Policies, and Employment

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# Motivation

- In the past few years, several states have adopted a new minimum wage (MW) policy, and at the federal level, there is an ongoing discussion about increasing the federal MW rate from $7 to $15 per hour

- Owing to their surge in popularity, MW policies have been at the center of recent policy debates. Underlying much of the debate is the central question:

  What is the effect of raising MW levels on employment? If the effect is significantly negative, then increasing the minimum wage may not benefit low-income workers, and could instead harm them

- While a considerable amount of research in economics exists, this evidence is mixed (e.g., Card and Krueger, 1994; Cengiz et al., 2019; Clemens and Wither, 2019), and the generally accepted conclusion is that there is no effect on aggregate employment

# What about the role of firm characteristics?

- None of the existing papers in economics look at the role of firms and their characteristics in explaining the relationship between minimum wage policies and employment levels
- Recent empirical analyses find that one particular firm characteristic, its financial constraint, is important to understand aggregate employment dynamics (Giroud and Mueller, 2017, 2019)

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- Research Question: Do financial constraints play a role in explaining the relationship between minimum wage policies and employment dynamics?

# Conceptual framework

- A rise in the minimum wage can lead to higher labor costs, potentially forcing financially constrained firms to reduce their employment levels, given an inability to offset these additional expenses from internal capital
- Even when firms have internal resources to cover the additional costs, it is well known that financially constrained firms prefer to preserve their liquidity to mitigate potential operational disruptions (Campello et al., 2011; Almeida et al., 2014)
- Several factors further exacerbate this situation, including the inability to use labor as collateral and the fixed component costs of employment (Oi, 1962; Ghaly et al., 2017), which presents specific challenges to labor financing (Benmelech et al., 2019, 2021)

# About this paper

- We compare establishments located in different states that are exposed to heterogeneous state minimum wage policies but belong to a single firm, with a given level of financial constraint
- We adopt two alternative quasi-experimental settings:
  1. We combine the staggered introduction of minimum wage policies during the period 1990-2020, and a border discontinuity approach, and use alternative measures of financial constraints at the firm level

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  2. We use the federal minimum wage increase during the financial crisis and an exogenous measure of financial constraints based on the ex-ante variation in long-term debt maturity

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- A counterfactual exercise and county-level regressions show that the minimum wage policies have a substantial effect on *overall* employment in the presence of financial constraints

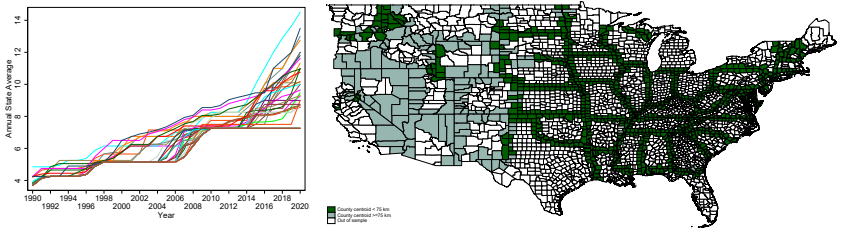
# Data

We collect information from different sources:

- Minimum wage information from Vaghul and Zipperer (2021)
- Establishment level information from the National Establishments Time Series (NETS) database
- Information on corporate balance sheet characteristics from Compustat

$\rightarrow$ Our final database is composed of 2,340,503 establishment-year observations and 231,552 establishments from 1990 to 2020

# Empirical strategy




(a) State Minimum Wages (b) Counties on state borders

→ Our first empirical approach exploits changes in minimum wage policies across states during the period 1990-2020 to evaluate the effect of employment on the establishments located in the counties on state borders

# Empirical model

- We estimate the following statistical model labeled Equation (1):

$$Log(Employment)_{i,t} = \beta MW_{s,t-1} + \delta_{f,t} + \eta_i + \theta_t + \epsilon_{i,t} \quad (1)$$

where:

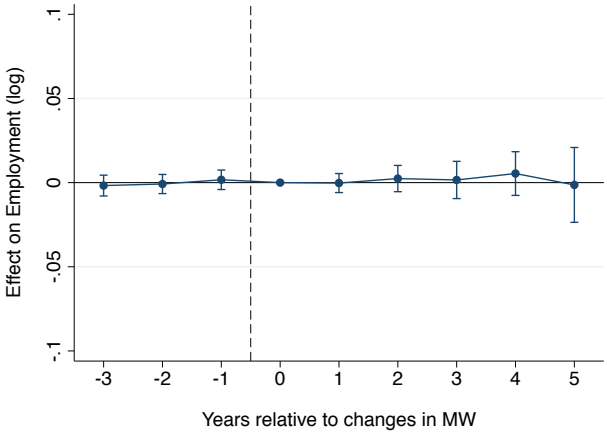
- *Log(Employment)* is the natural logarithm of the number of employees at establishment $i$ at time $t$.
- *MW* is the effective minimum wage of the county $i$ in state $s$ at time $t-1$.
- $\eta_i$ are establishment fixed effects.
- $\theta_t$ are time-fixed effects.
- $\delta_{f,t}$ are firm times year fixed effects.

# Minimum wage and employment - Average effect

| | (1) | (2) | (3) |
|---|---|---|---|
| | All counties | Counties on borders | Counties on borders ($\leq 75km$) |
| Variables | Employment (log) | Employment (log) | Employment (log) |
| MW | -0.002 | 0.002 | -0.002 |
| | (0.002) | (0.002) | (0.003) |
| Establishment FE | ✓ | ✓ | ✓ |
| Year $\times$ Firm FE | ✓ | ✓ | ✓ |
| Observations | 2,340,503 | 707,713 | 625,679 |
| Adjusted R-squared | 0.931 | 0.932 | 0.932 |

$\rightarrow$ We do not find any average effect of minimum wage changes on establishments' employment

# Minimum wage and employment - Dynamic effect




$\rightarrow$ This picture shows the dynamic effect of changes in the minimum wage on establishments' employment. Importantly, we show that the parallel trend assumption

# Corporate financial constraints

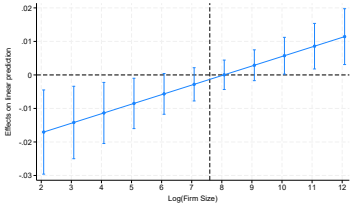
- We consider three well-known alternative measures of corporate financial frictions:
  - corporate size (Gertler and Gilchrist, 1994)
  - the Whited and Wu (WW) index (Whited and Wu, 2006)
  - the Size-Age (SA) index (Hadlock and Pierce, 2010)
- In a further test, we also propose other measures of constraints:
  - the Kaplan and Zingales (KZ) index (Kaplan and Zingales, 2000)
  - a composite financial constraint index (Bartram et al., 2022)
  - textual analysis of the 10-K filings (Bodnaruk et al., 2015)
  - issuance of bonds or syndicated loans

# Minimum wage and employment - Heterogeneous effect

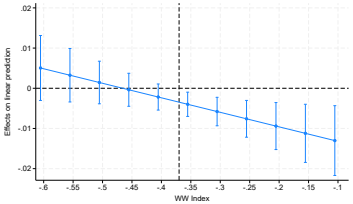
| Variables | (1) All counties Employment (log) | (2) Counties on borders Employment (log) | (3) Counties on borders($\leq$ 75$km$) Employment (log) |
|---|---|---|---|
| | | Panel A: interaction with corporate size | |
| MW | -0.015*** | -0.023*** | -0.031*** |
| | (0.005) | (0.008) | (0.010) |
| **MW $\times$ Log(Firm Size)** | **0.002**** | **0.003***** | **0.003**** |
| | **(0.001)** | **(0.001)** | **(0.001)** |
| | | Panel B: interaction with the WW index | |
| MW | -0.017*** | -0.020*** | -0.030*** |
| | (0.006) | (0.008) | (0.009) |
| **MW $\times$ WW Index** | **-0.036**** | **-0.053***** | **-0.066***** |
| | **(0.016)** | **(0.018)** | **(0.023)** |
| | | Panel C: interaction with corporate SA index | |
| MW | -0.005*** | -0.006** | -0.010*** |
| | (0.001) | (0.003) | (0.003) |
| **MW $\times$ SA Index** | **-0.002** | **-0.005***** | **-0.005**** |
| | **(0.001)** | **(0.002)** | **(0.002)** |

$\rightarrow$ One standard deviation change in the three corporate financial constraint variables decreases establishment employment by 1 % after a \$1 increase in the minimum wage

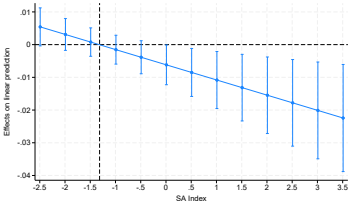
# Marginal effects across the financial constraints distribution




(c) Size




(d) WW Index




(e) SA Index

→ When investigating the impact of minimum wage policies across the financial constraints distribution, we detect negative effects on employment for constrained firms, but also some positive effects for unconstrained firms

# What can explain the positive effects for unconstrained firms?

- Establishments of unconstrained firms can better absorb labor costs and benefit from wage increases.
- Partially driven by reallocation from constrained to unconstrained firms.
- Stronger in areas with:
  - High supply of potential minimum-wage workers,
  - Large hiring gaps,
  - High quit-to-hire ratios.

**Theoretical alignment:**

- Consistent with job search models: Burdett and Mortensen (1989); Flinn (2006); Giuliano (2013); Manning (2021).
- Matches frictional labor market predictions: Portugal and Cardoso (2006); Brochu and Green (2013); Dube et al. (2016, 2019).

# Corporate exposure to MW policies - Firm-level analysis

- How does exposure to minimum wage policies affect overall corporate employment, performance, and policies?
- We measure corporate exposure to changes in minimum wage policies of the company $f$ at time $t$ using a shift-share approach as shown in the following Equation:

$$Exposure\ MW_{f,t} = \sum_{n=1}^{51} Employees_{f,s,t} \times Minimum\ Wage_{s,t} \tag{2}$$

where *Employees* is the share of employees of company $f$ in state $s$ at time $t$ and *Minimum Wage* is the effective minimum wage in state $s$ at time $t$.

# Overall corporate employment

- Managers may relocate employment from establishments in counties exposed to minimum wage regulations to establishments that are not exposed
- This could imply that aggregate corporate employment of financially constrained firms changes little or perhaps not at all after changes in the minimum wage

# How do MW policies affect corporate employment?

| Variables | (1) Employment (log) | (2) Employment (log) | (3) Employment (log) |
|---|---|---|---|
| MW Exposure | -0.041*** | -0.008 | 0.017 |
| | (0.012) | (0.011) | (0.010) |
| Log(Firm Size) | 0.256*** | | |
| | (0.019) | | |
| **MW Exposure × Log(Firm Size)** | **0.008*** ** | | |
| | **(0.002)** | | |
| WW Index | | -1.077*** | |
| | | (0.284) | |
| **MW Exposure × WW Index** | | **-0.140*** ** | |
| | | **(0.036)** | |
| SA Index | | | -0.123*** |
| | | | (0.017) |
| **MW Exposure × SA Index** | | | **-0.019*** ** |
| | | | **(0.002)** |
| Firm FE | ✓ | ✓ | ✓ |
| Year × Industry FE | ✓ | ✓ | ✓ |
| Observations | 54,996 | 50,332 | 54,996 |

# Corporate policies and performance

- Why do financially constrained firms reduce corporate employment?
- To answer this question, we investigate how exposure to minimum wage policies affects corporate financial policies and performance

# How do MW policies affect corporate policies?

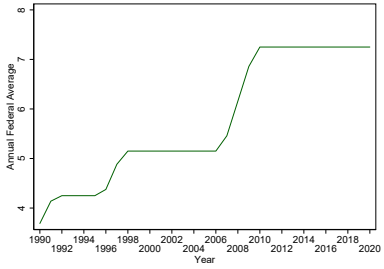
| Variables | (1) Cash | (2) Leverage | (3) Leverage (Short) | (4) Leverage (Long) | (5) Trade Credit | (6) R&D | (7) Capital Exp. | (8) ROA |
|---|---|---|---|---|---|---|---|---|
| MW Exposure | -0.008** | 0.111*** | 0.012* | 0.093*** | 0.027*** | -0.004** | -0.001 | 0.001 |
| | (0.004) | (0.035) | (0.007) | (0.033) | (0.008) | (0.002) | (0.001) | (0.004) |
| Firm FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Year × Industry FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 48,422 | 48,297 | 48,456 | 48,329 | 48,481 | 28,616 | 48,055 | 54,696 |
| Adjusted R-squared | 0.532 | 0.186 | 0.239 | 0.207 | 0.284 | 0.719 | 0.543 | 0.554 |

→ These results demonstrate that companies subject to minimum wage policies are forced to acquire resources to meet short-term liquidity needs, potentially leading financially constrained firms to reduce their workforce.

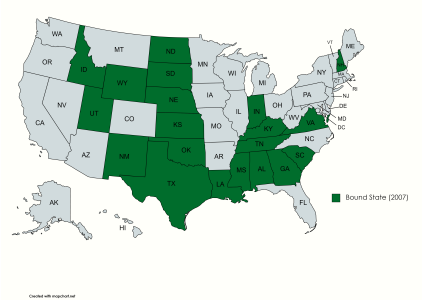
# The Great Recession and the federal MW increase

- Following Clemens and Wither (2019), we use as a laboratory the sudden increase in the federal minimum wage during the Great Recession and compare employment dynamics of establishments located in bound *vs* unbound states to this change.

# Minimum wage, the financial crisis, and employment




(f) Changes in the federal MW




(g) Bounded States

$\rightarrow$ The figure on the left shows the increase in the federal minimum wage in 2007. On the right, we show the states affected by this change

# The Great Recession and corporate employment

- We limit our sample to the period 2004-2011 and estimate the following Equation:

$$Log(Employment)_{i,t} = \beta Bound_s \times Post_t + \delta_{f,t} + \eta_i + \theta_t + \epsilon_{i,t} \quad (3)$$

where:

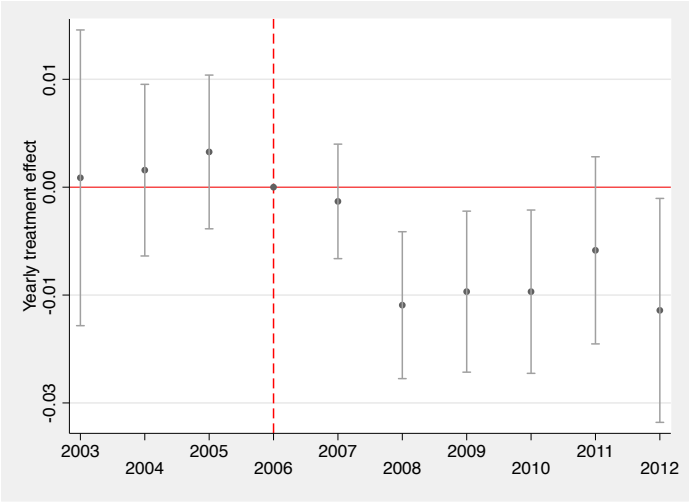
- *Bound* is a dummy variable equal to 1 if the establishment is located in a state bound to the federal minimum wage
- *Post* is a dummy variable equal to 1 after 2007.
- $\eta_i$ are establishment fixed effects.
- $\theta_t$ are time fixed effects.
- $\delta_{f,t}$ are firm times year fixed effects.

# Minimum Wage, the financial crisis, and employment

| | (1) | (2) | (3) |
|---|---|---|---|
| | All counties | Counties on borders | Counties on borders($\leq 75km$) |
| Variables | Employment (log) | Employment (log) | Employment (log) |
| Post $\times$ Bound | -0.003 | -0.012** | -0.012** |
| | (0.003) | (0.005) | (0.005) |
| Establishment FE | ✓ | ✓ | ✓ |
| Year $\times$ Firm FE | ✓ | ✓ | ✓ |
| Observations | 617,030 | 187,902 | 166,693 |
| Adjusted R-squared | 0.960 | 0.962 | 0.962 |

$\rightarrow$ Establishments that belong to a state bound by the federal minimum wage change are observed to decrease their employment by 1.2 % with respect to the average employment level

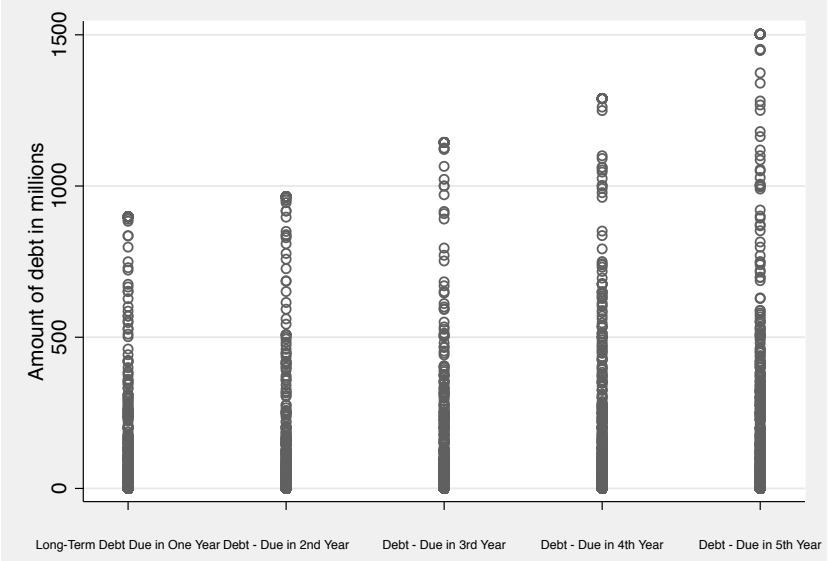
# Dynamic employment effects - Financial crisis



# An exogenous measure of financial constraints

- What are the roles of financial frictions in this setting?
- We build an exogenous measure of financial frictions based on ex-ante (crisis) variation in long-term debt maturity
  - Firms' debt structure prior to the crisis is unlikely to be correlated with other unobserved firm characteristics and investment opportunities (Duval et al., 2020; Almeida et al., 2012; Benmelech et al., 2019)
- We fully interact this variable with *Bound* and *Post* in Equation (3)

# Distribution of the long-term-debt prior to the crisis



# Minimum wage, the financial crisis, and employment

| | (1) | (2) | (3) |
|---|---|---|---|
| | All counties | Counties on borders | Counties on borders($\leq 75km$) |
| Variables | Employment (log) | Employment (log) | Employment (log) |
| | | Panel A: short-term frictions | |
| Post × Bound | -0.004 | -0.006 | -0.006 |
| | (0.005) | (0.007) | (0.007) |
| **Post × Bound × Constraints** | **-0.000** | **-0.005*** | **-0.005*** |
| | **(0.002)** | **(0.002)** | **(0.003)** |
| Establishment FE | ✓ | ✓ | ✓ |
| Year × Firm FE | ✓ | ✓ | ✓ |
| Observations | 611,520 | 185,902 | 164,925 |
| Adjusted R-squared | 0.953 | 0.955 | 0.955 |

→ a one-standard-deviation change in the financial friction measure leads to a 0.7 % decrease in employment compared to the average value of the establishment outcome variable

# Aggregate implications of financial constraints

- Following Chodorow-Reich (2014), we construct a counterfactual assuming all establishments affected by the federal MW change face **no financial constraints**:

$$\log(Emp_{i,t})^{CF} = \log\widehat{(Emp_{i,t})} + \hat{\beta}_1 \times \Delta FC_i$$

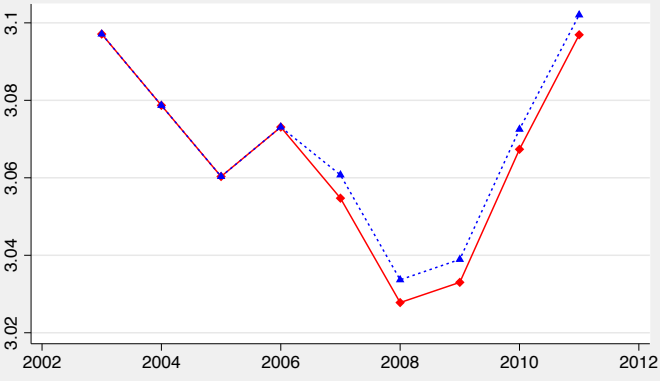
- Employment gains are calculated as:

$$\text{Employment Gains}_{i,t} = \exp(\log(Emp_{i,t})^{CF}) - \exp(\log\widehat{(Emp_{i,t})})$$

- Total gains (2007–2011), expressed relative to 2007 employment:

$$\text{Total \% Employment Gains} = \frac{\sum_{t=2007}^{2011}\sum_i \text{Gains}_{i,t}}{\text{Employment}_{2007}} \times 100$$

# Results of the counterfactual exercise




Total losses in employment during the financial crisis = 4.8 %
Total gains in treated states in absence of financial constraints after federal MW rise = 1.4 %
Total gains after considering re-weighting= 2.3%

# Conclusions

- Our results show that minimum wage could have a substantial negative effect on aggregate employment in the presence of corporate financial constraints
- Our findings provide a better understanding of how minimum wage policies affect corporate financial and economic performance
- Our results imply that optimal government policies need to take into account financial constraints (Itskhoki and Moll, 2019; Caballero and Lorenzoni, 2014) and can help reconcile previously mixed findings in the economics literature

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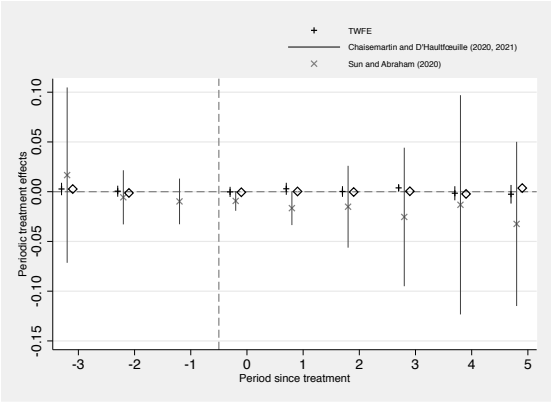
# Alternative estimators

Back



# Alternative measures of financial constraints

Back

| | (1) All counties | (2) Counties on state borders | (3) Counties on borders ($\leq 75km$) |
|---|---|---|---|
| Variables | Employment (log) | Employment (log) | Employment (log) |
| | | Panel A: Interaction with the KZ Index | |
| MW $\times$ KZ Index | 0.000 | -0.000 | -0.000 |
| | (0.000) | (0.001) | (0.001) |
| | | Panel B: Interaction with the composite index | |
| MW $\times$ Composite Index | -0.002 | -0.008** | -0.010** |
| | (0.002) | (0.003) | (0.004) |
| | | Panel C: Interaction with the PCA index | |
| MW $\times$ PCA Index | -0.003** | -0.005*** | -0.005** |
| | (0.001) | (0.001) | (0.002) |
| | | Panel D: Interaction with the textual analysis index | |
| MW $\times$ Constraining (log) | -0.007** | -0.011* | -0.017** |

# Main results - MW sensitive industries

Back

| | (1) All counties | (2) Counties on borders | (3) Counties on borders($\leq 75km$) |
|---|---|---|---|
| Variables | Employment (log) | Employment (log) | Employment (log) |
| | | Panel A: interaction with corporate size | |
| MW | -0.020** | -0.025** | -0.033*** |
| | (0.010) | (0.011) | (0.011) |
| **MW $\times$ Log(Firm Size)** | **0.002*** | **0.003**** | **0.004**** |
| | **(0.001)** | **(0.001)** | **(0.001)** |
| | | Panel B: interaction with the WW index | |
| MW | -0.024** | -0.024** | -0.034*** |
| | (0.011) | (0.009) | (0.011) |
| **MW $\times$ WW Index** | **-0.058**** | **-0.061**** | **-0.076***** |
| | **(0.029)** | **(0.023)** | **(0.027)** |
| | | Panel C: interaction with the SA index | |
| MW | -0.007*** | -0.009** | -0.013*** |

# Main results - MW no sensitive industries

Back

| | (1) All counties | (2) Counties on borders | (3) Counties on borders($\leq 75km$) |
|---|---|---|---|
| Variables | Employment (log) | Employment (log) | Employment (log) |
| | | Panel A: interaction with corporate size | |
| MW | -0.010 | -0.021 | -0.028 |
| | (0.007) | (0.014) | (0.018) |
| **MW $\times$ Log(Firm Size)** | **0.001** | **0.003** | **0.003** |
| | **(0.001)** | **(0.002)** | **(0.002)** |
| | | Panel B: interaction with the WW index | |
| MW | -0.010* | -0.017 | -0.026 |
| | (0.006) | (0.013) | (0.016) |
| **MW $\times$ WW Index** | **-0.017** | **-0.045** | **-0.057** |
| | **(0.015)** | **(0.031)** | **(0.039)** |
| | | Panel C: interaction with the SA index | |
| MW | -0.004 | -0.004 | -0.008 |

# The extensive margin

Back

| | (1) All counties | (2) Counties on borders | (3) Counties on borders($\leq 75km$) |
|---|---|---|---|
| Variables | Establishments (log) | Establishments (log) | Establishments (log) |
| | Panel A: interaction with corporate size | | |
| MW | -0.032** | -0.014 | -0.013 |
| | (0.014) | (0.011) | (0.011) |
| **MW $\times$ Log(Firm Size)** | **0.005**** | **0.003*** | **0.002*** |
| | **(0.002)** | **(0.002)** | **(0.001)** |
| | Panel B: interaction with the WW index | | |
| MW | 0.008** | -0.009 | -0.010 |
| | (0.004) | (0.008) | (0.008) |
| **MW $\times$ WW Index** | **-0.001** | **-0.043*** | **-0.040*** |
| | **(0.001)** | **(0.024)** | **(0.022)** |
| | Panel C: interaction with the SA index | | |
| MW | 0.000 | 0.003 | 0.003 |

# County level results

Back

| | (1) All counties | (2) Counties on state borders | (3) Counties on borders ($\leq 75km$) |
|---|---|---|---|
| Variables | Employment (log) | Employment (log) | Employment (log) |
| | | Panel A: Interaction with corporate size | |
| MW $\times$ Log(Firm Size) | 0.030*** | 0.034*** | 0.033*** |
| | (0.004) | (0.006) | (0.007) |
| | | Panel B: Interaction with the WW index | |
| MW $\times$ WW Index | -0.507*** | -0.570*** | -0.577*** |
| | (0.066) | (0.114) | (0.126) |
| | | Panel C: Interaction with the SA index | |
| MW $\times$ SA Index | -0.033*** | -0.036*** | -0.037*** |
| | (0.009) | (0.011) | (0.012) |

# Banking deregulation as a shock to local credit supply

Back

| | (1) All counties | (2) Counties on state borders | (3) Counties on borders ($\leq 75km$) |
|---|---|---|---|
| Variables | Employment (log) | Employment (log) | Employment (log) |
| | | Panel A: Interaction with the Size | |
| MW $\times$ Log(Size) $\times$ Deregulation | -0.002 | -0.004*** | -0.003** |
| | (0.001) | (0.001) | (0.002) |
| | | Panel B: Interaction with the WW Index | |
| MW $\times$ WW Index $\times$ Deregulation | 0.019 | 0.062*** | 0.052** |
| | (0.024) | (0.018) | (0.022) |
| | | Panel C: Interaction with the SA index | |
| MW $\times$ SA Index $\times$ Deregulation | 0.002 | 0.003** | 0.003* |
| | (0.001) | (0.002) | (0.002) |