# Minimum Wages and the Rigid-Wage Channel of Monetary Policy

Robbie Minton

Brian Wheaton

Hoover Economic Policy Lunch

November 17, 2021

# Introduction

- Monetary policy acts on nominal rigidities.

- The minimum wage is a legislatively-fixed nominal object.

- Consequently, the *real* minimum wage is relaxed by inflation.
  - Workers can be hired at a cheaper real wage.

- Does monetary policy have a larger effect on employment in the presence of a higher share of minimum wage workers?
  - And, if so, how quantitatively important is this particular channel of monetary policy efficacy?

# Motivation

- Recall the profit maximization problem of a competitive firm:

$$\max_{X,L} F(X,L) - \frac{1}{P}\omega \cdot X - \frac{1}{P}\overline{w}L$$

- $L$ is labor subject to the wage floor, and $X$ is all other inputs.

- If expansionary monetary policy increases $\omega$ along with $P$,

- Then inflation would lead to

  - A substitution effect towards low skill workers, as the real minimum wage has fallen while other input prices have remained constant;

  - A scale effect, as inflation has reduced a real input price and induces firms to use more of all inputs.

# Graphical Intuition

- Inflation causes prices, *P*, and market wages, *W*, to increase.

- The minimum wage, $\overline{W}$, remains fixed. Therefore the real minimum wage declines.

- The extent of the distortion in the labor market is reduced.
  - New hiring can occur – particularly of minimum-wage workers.

4
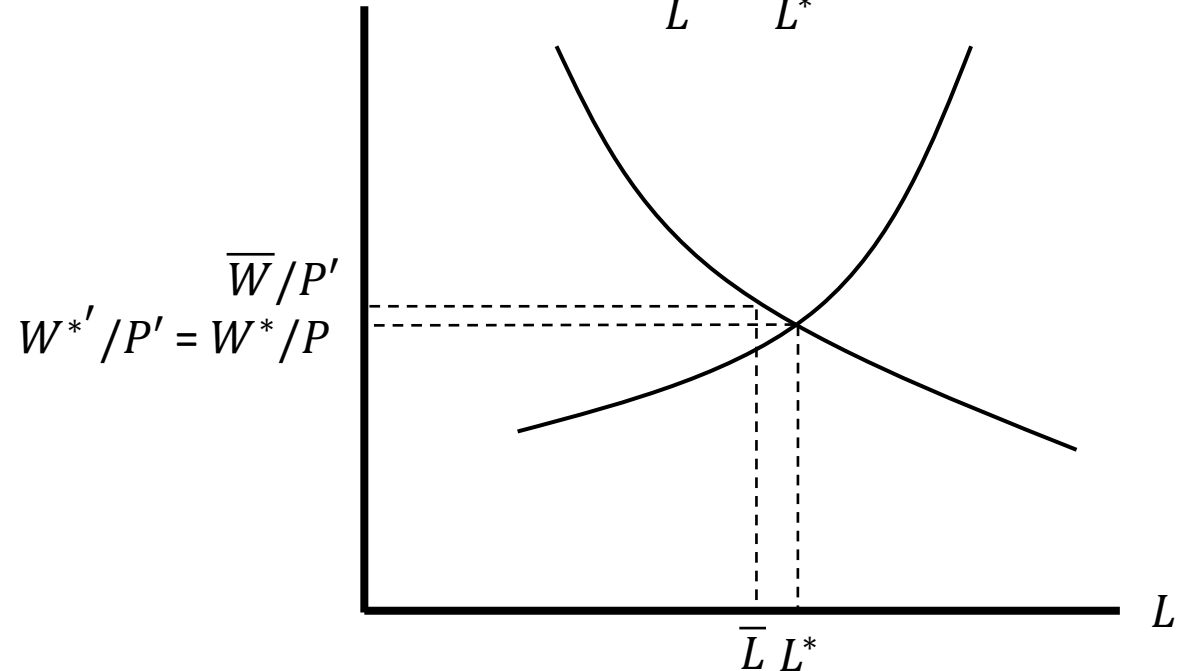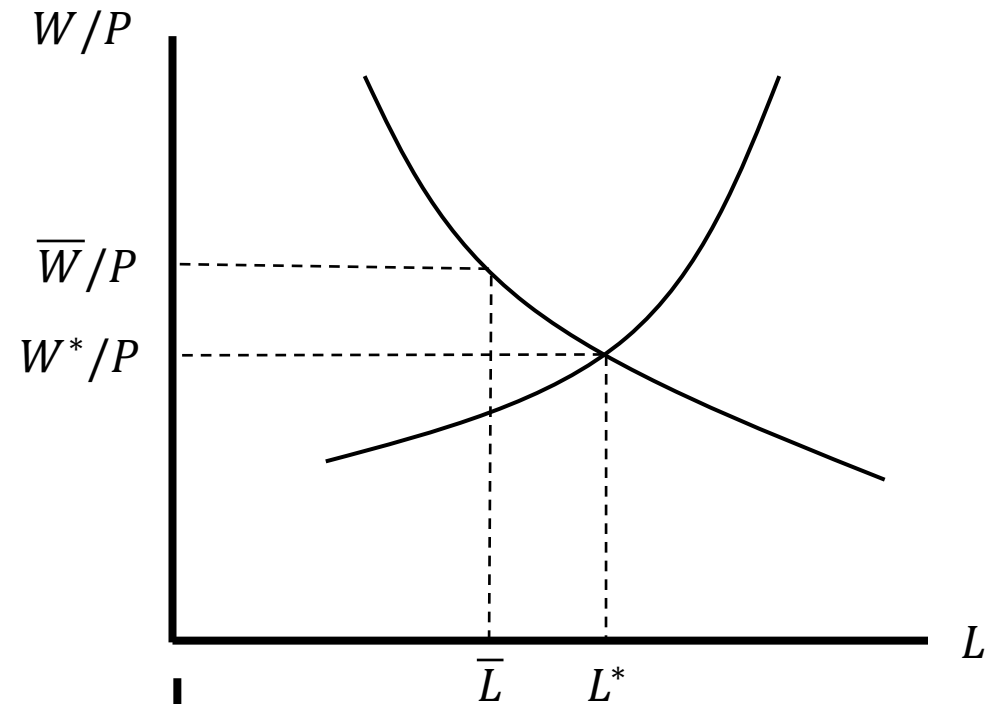
# How many workers earn the minimum?

- Minimum wage worker: Any wage worker making between 90%-110% of the minimum wage in the state of residence (computed in the CPS).

- Boxplot shows heterogeneity across states in their minimum wage employment shares.

The Real Minimum Wage and Minimum Wage Employment Shares
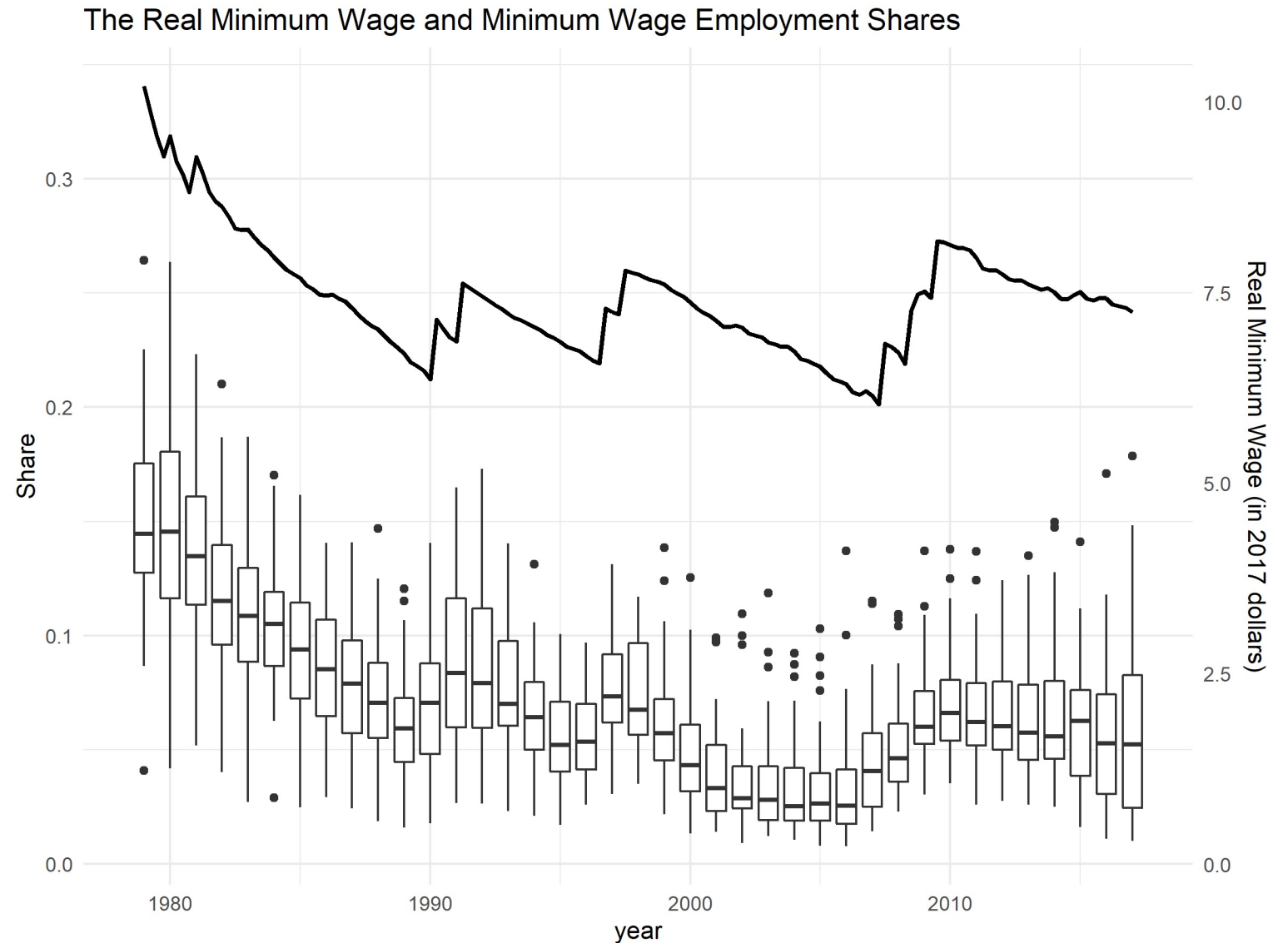
# Baseline Regression

- Data cover 1975 – 2008.

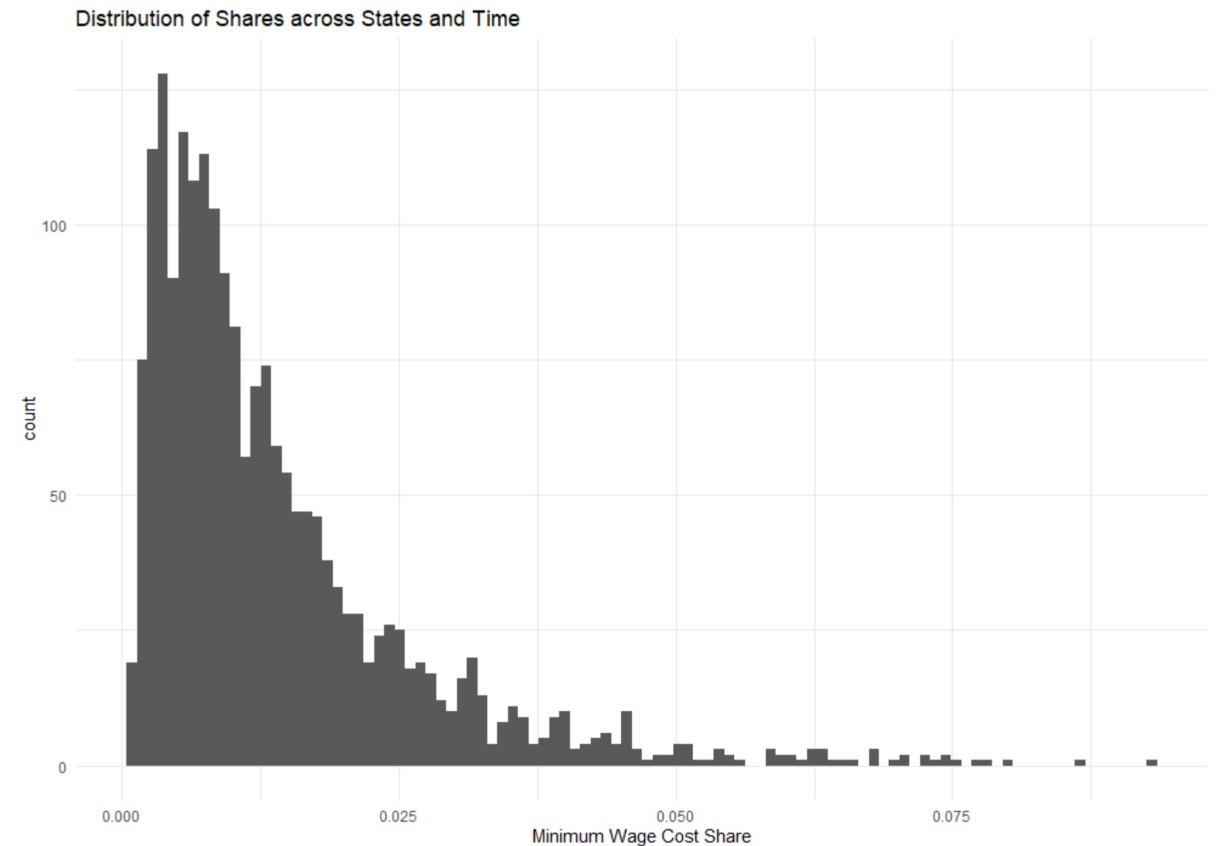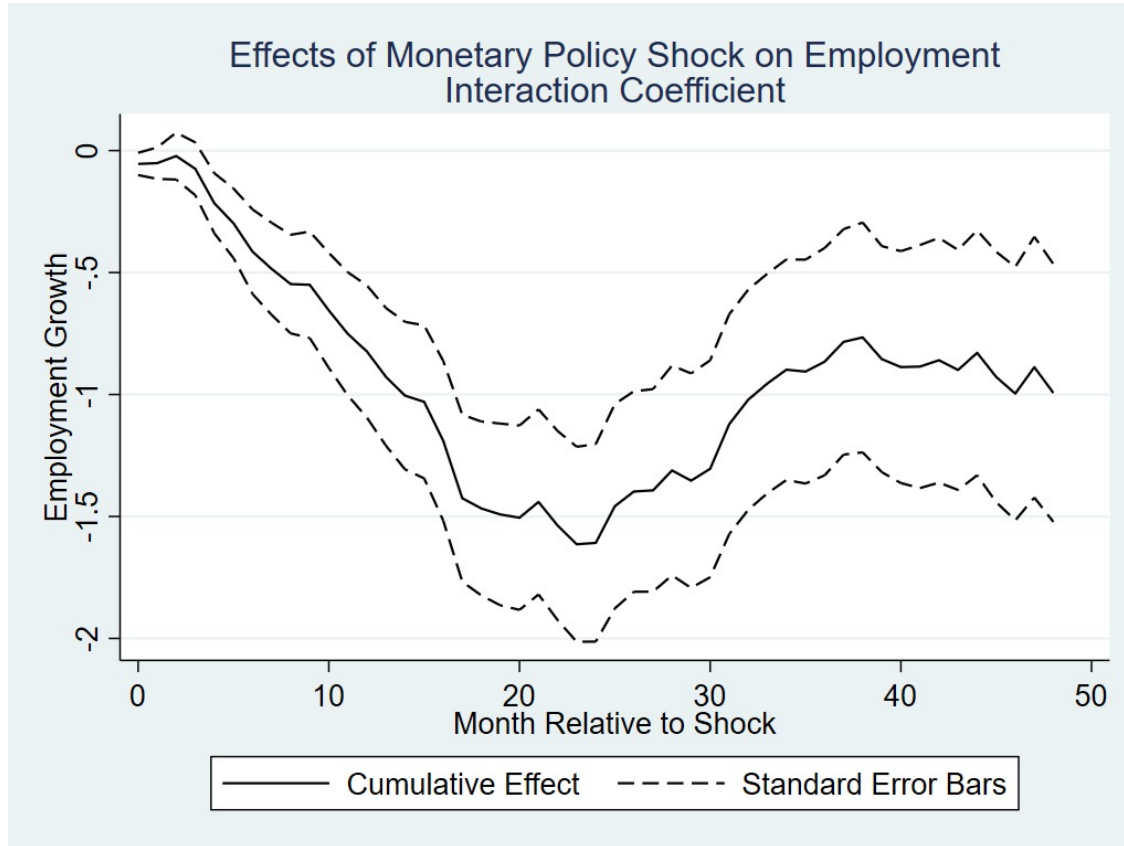- Standard (monthly) monetary policy regression:

$$\Delta L_t = \sum_{j=1}^{48} \beta_j^L \Delta L_{t-j} + \sum_{j=0}^{48} \beta_j^{FFR} \Delta FFR_{t-j} + \epsilon_t$$

- $\Delta L$: change in log national monthly employment (from the QCEW).

- $\Delta FFR$: exogenous component of the change in the federal funds rate developed in Romer and Romer (2004).

- We change this regression as little as possible for our first regression:

$$\Delta L_{s,t} = \sum_{j=1}^{48} \beta_j^L \Delta L_{s,t-j} + \sum_{j=0}^{48} \beta_j^{FFR} \cdot (ShareMin_{s,t} \#\# \Delta FFR_{t-j}) + \epsilon_{s,t}$$

- Subscript $s$ denotes a state, $ShareMin_s$ is the cost share of minimum wage workers in state $s$, and ## denotes an interaction term with variables also included independently

# Effects on Employment



Effects of Monetary Policy Shock on Employment Interaction Coefficient



Distribution of Shares across States and Time

- Interpretation: a state with a 3% cost share of minimum wage workers experiences, at peak, a 4.5 pp larger employment change in response to monetary policy than a 0% cost share state.

# Initial Robustness
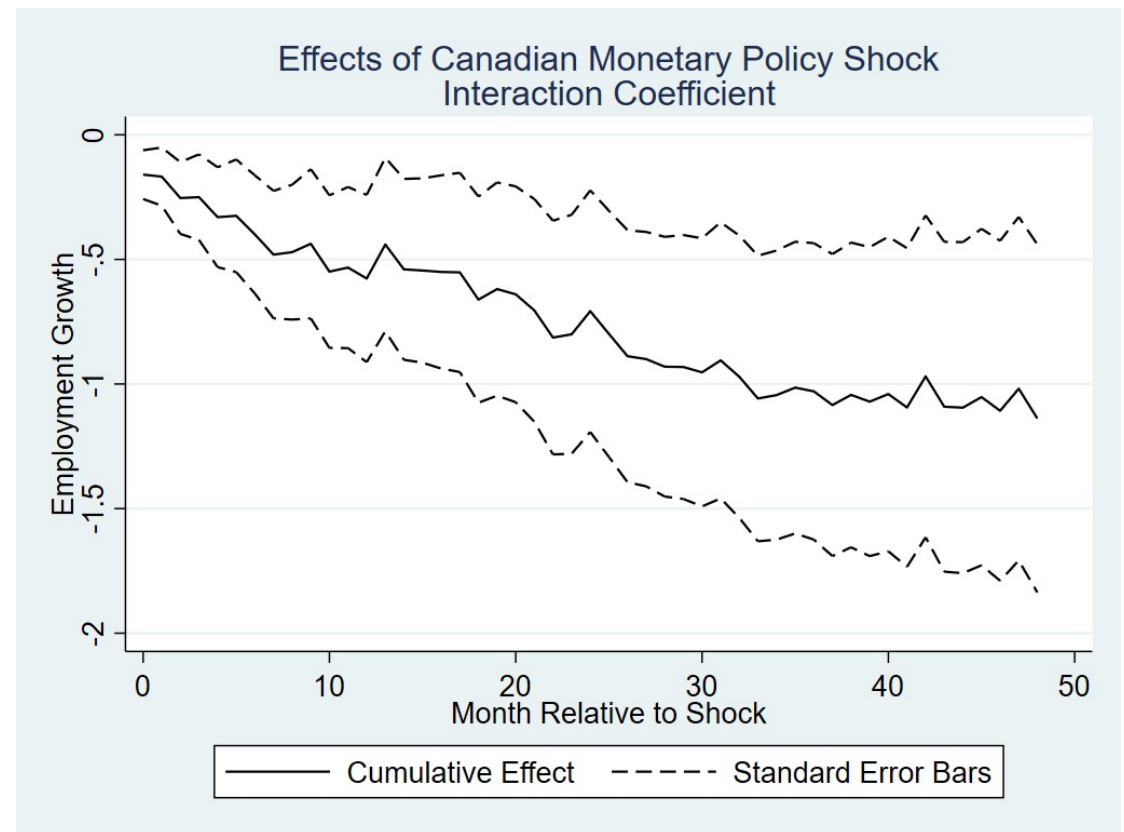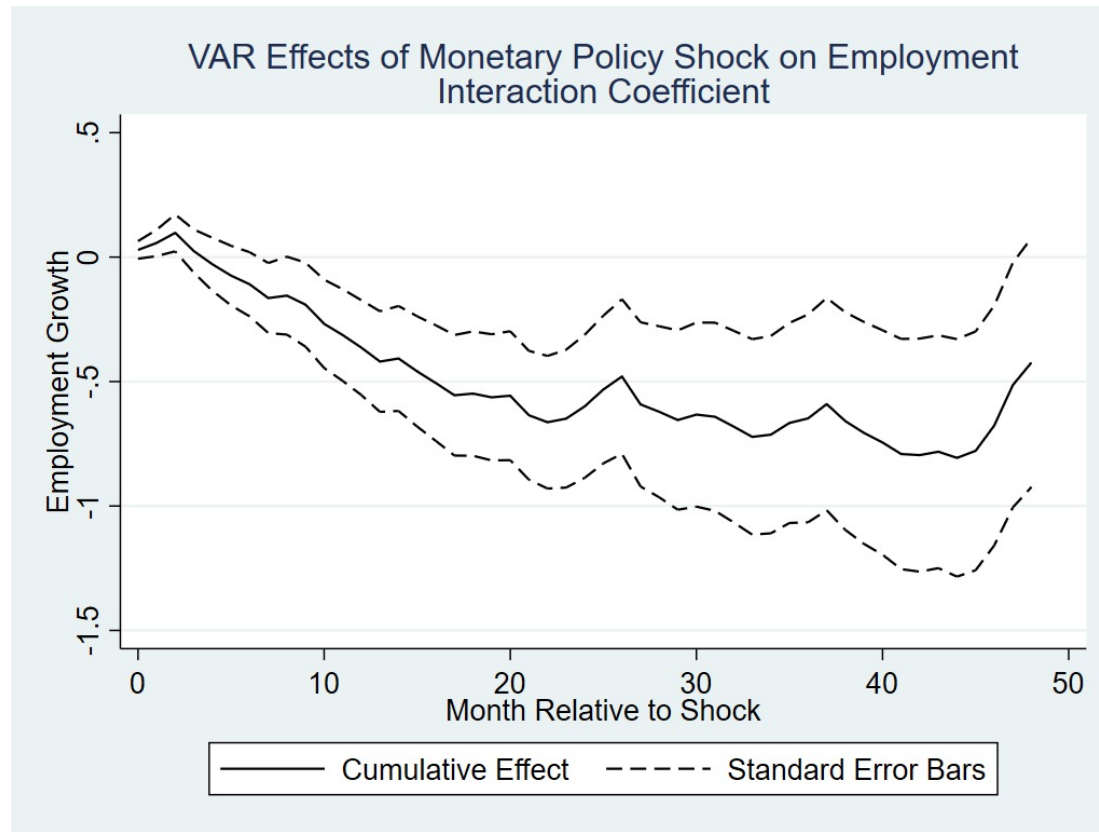


- Effect remains significant if we use VAR shocks (Coibion, 2012) instead of the narrative Romer and Romer (2004) shocks.
- Effect remains significant if we run the same exercise on Canadian data.

# Industry Confounds

- States with a high share of minimum wage workers may have different industries than other states, and these may be the industries more exposed to monetary policy.
  - Result is robust to state and time fixed effects.
    - Controls for persistent industry differences by state and national time trends
  - Result is robust to a Bartik control, constructed as follows:
    - In each time period $t$, compute employment growth in each national industry $j$: $Shift_{j,t}$
    - For each state and time period, weight national industry employment growth by the employment share in that industry *last* period: $Share_{s,j,t-1}$
    - The control is $\Delta S_{s,t} = \sum_j Shift_{j,t} \, Share_{s,j,t-1}$

# Industry Confounds

- Results remain highly significant, but magnitudes have fallen to be very close to those predicted by the full model.
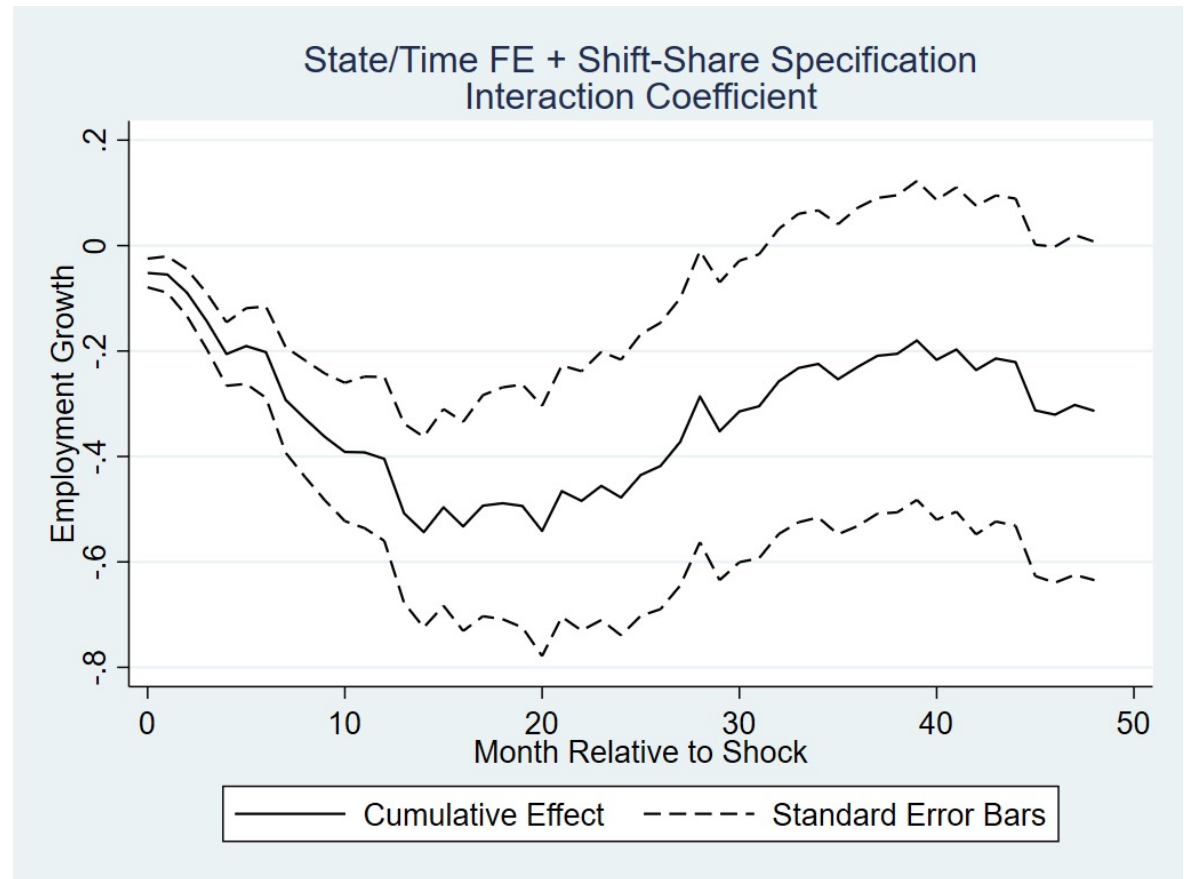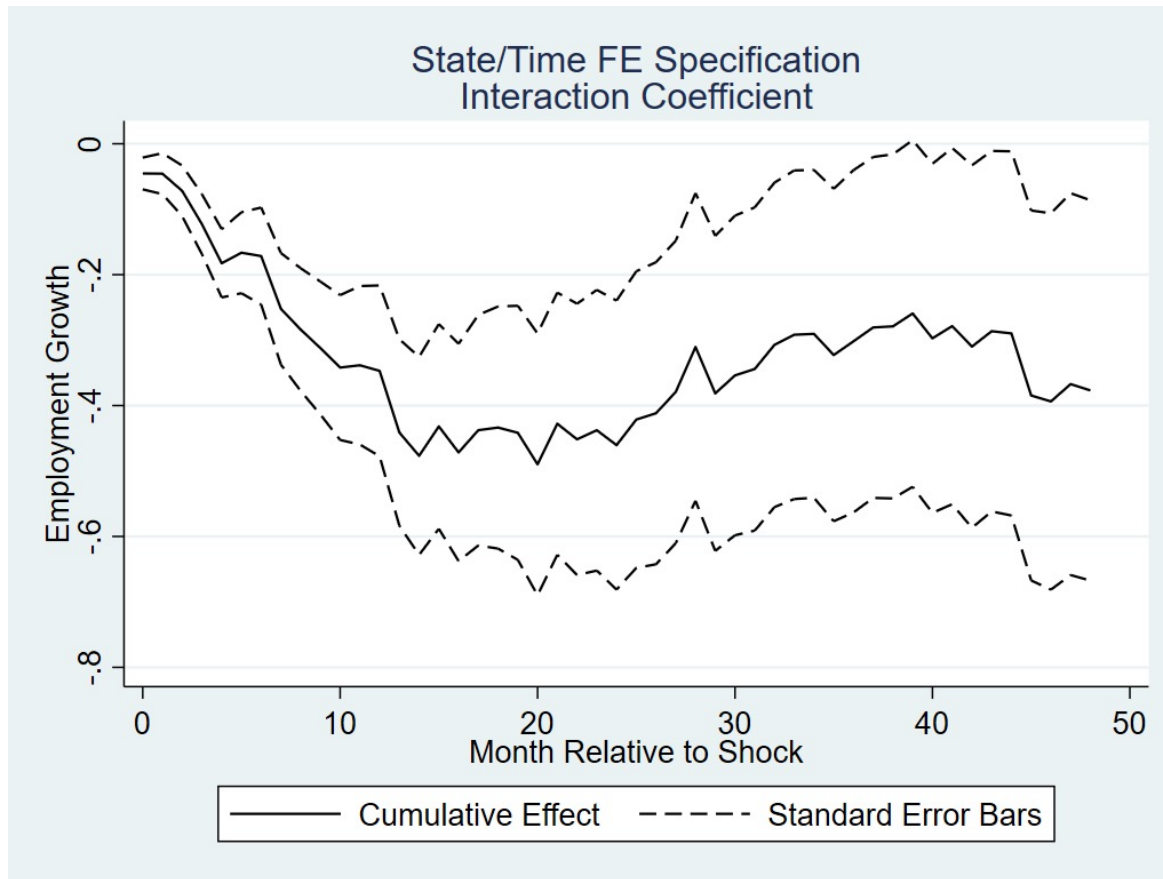
# Other Controls

- Not driven by crude measures of banking use: deposits per capita.

- Not driven by share of liquid deposits in banks (checking deposits / total deposits by state).
  - Motivated by Drechsler, Savov, and Schnabl (2017)

- Not driven by personal income per capita.
  - Motivated by potential MPC issues highlighted in Mian, Rao and Sufi (2013)

# FFR Shocks
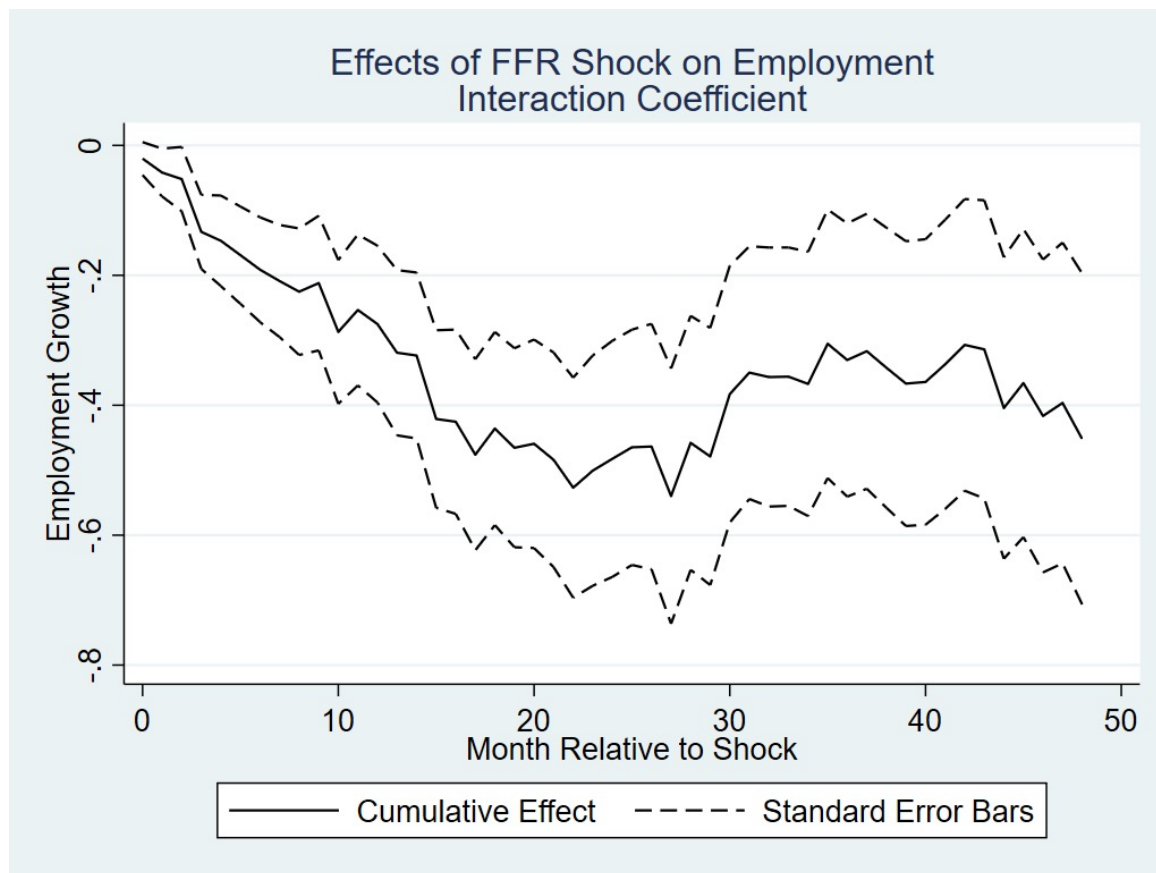


Baseline Specification with FFR Shocks
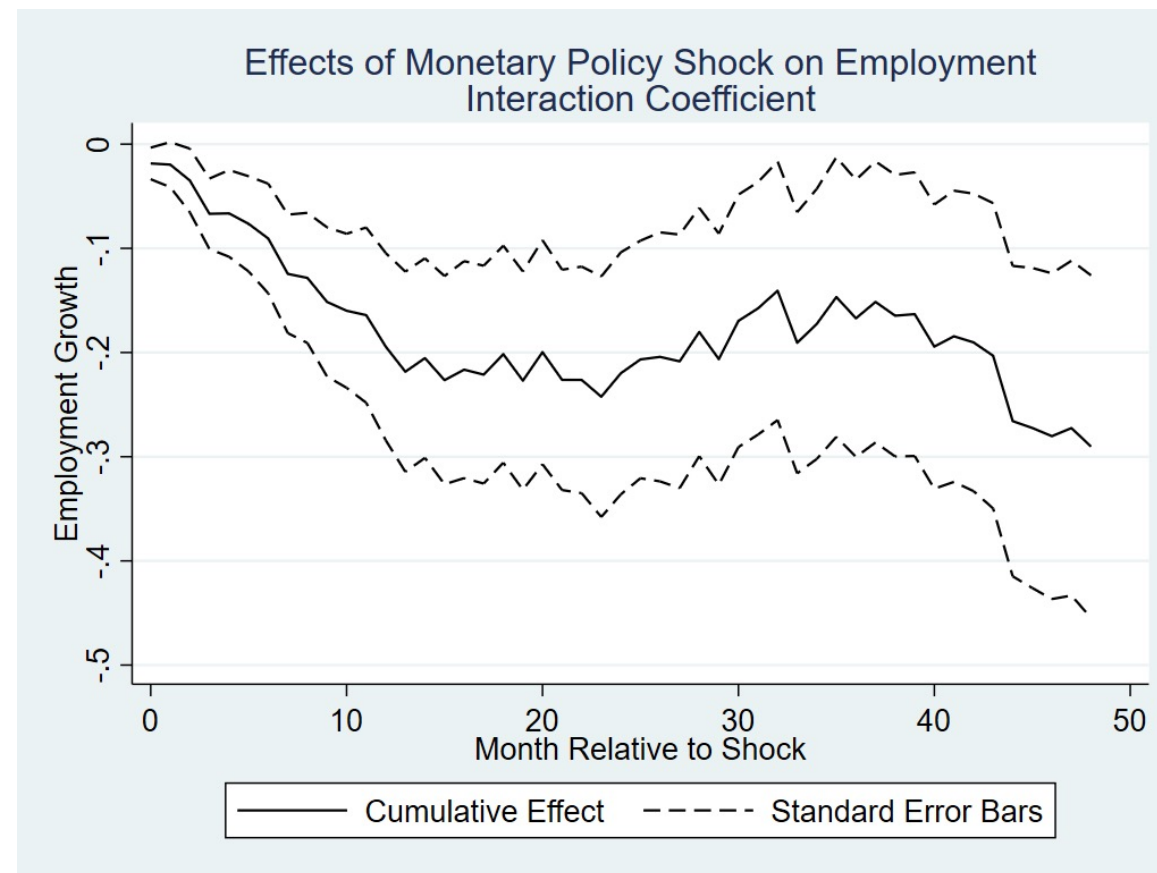
Shift-Share + State/Time FE Specification with FFR Shocks

# State Confounds

- One might think that the states with a high share of minimum wage workers are the same states over time.
    - Three responses:
        - The states with a high share of minimum wage workers are changing over our sample.
        - Just showed baseline results are robust to state and time fixed effects.
        - No result if, instead of minimum wage share, we interact with a dummy for being in the South.
- We perform the same analysis at the county level and include state by time fixed effects.
    - Idea here is to compare low and high minimum wage share counties within state-time to control for time-varying, state-level confounds.

# Focusing on Cross-Sectional Variation



Effects of Monetary Policy Shock
Within-State County-Level Specification
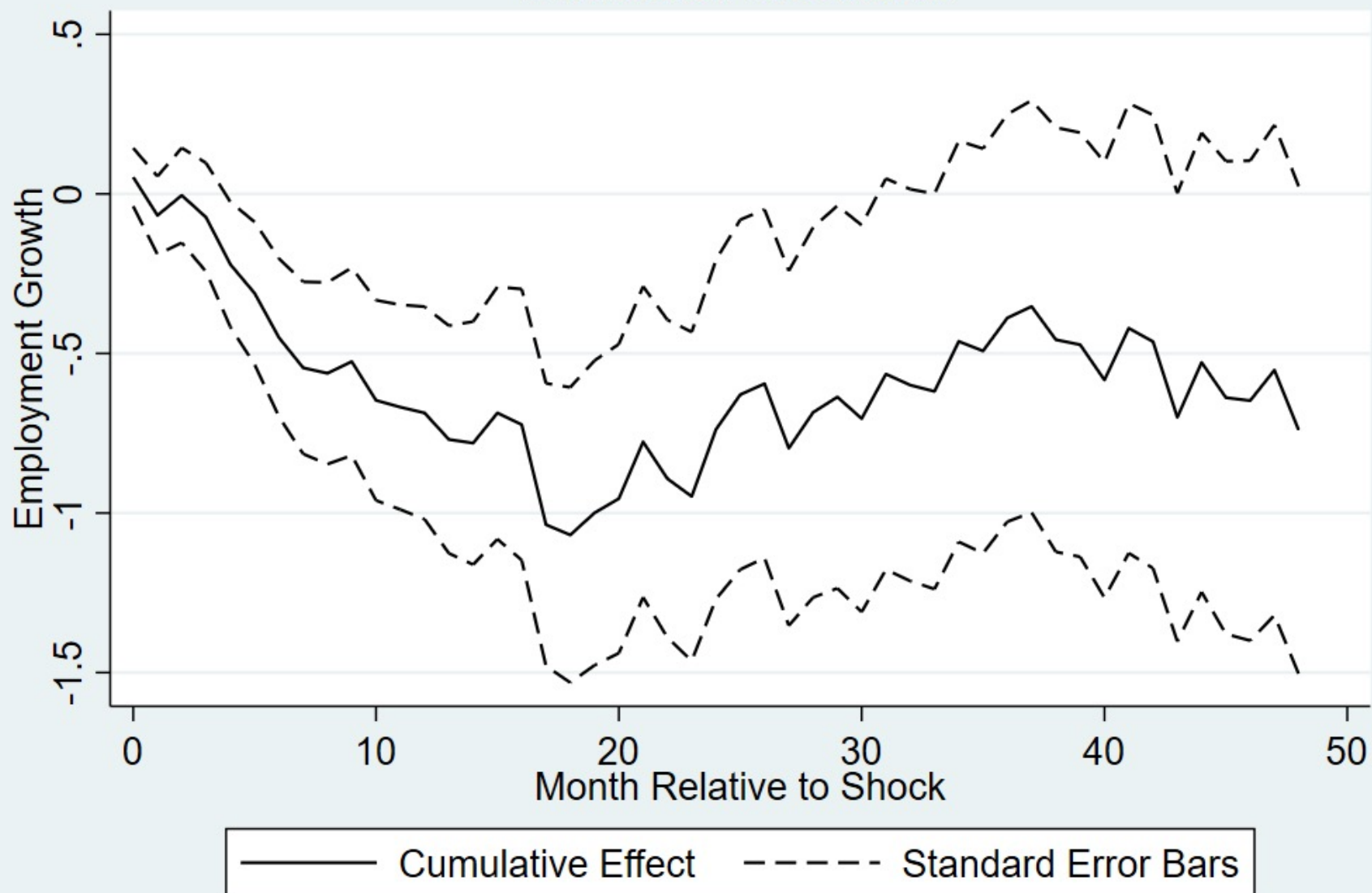Interaction Coefficient
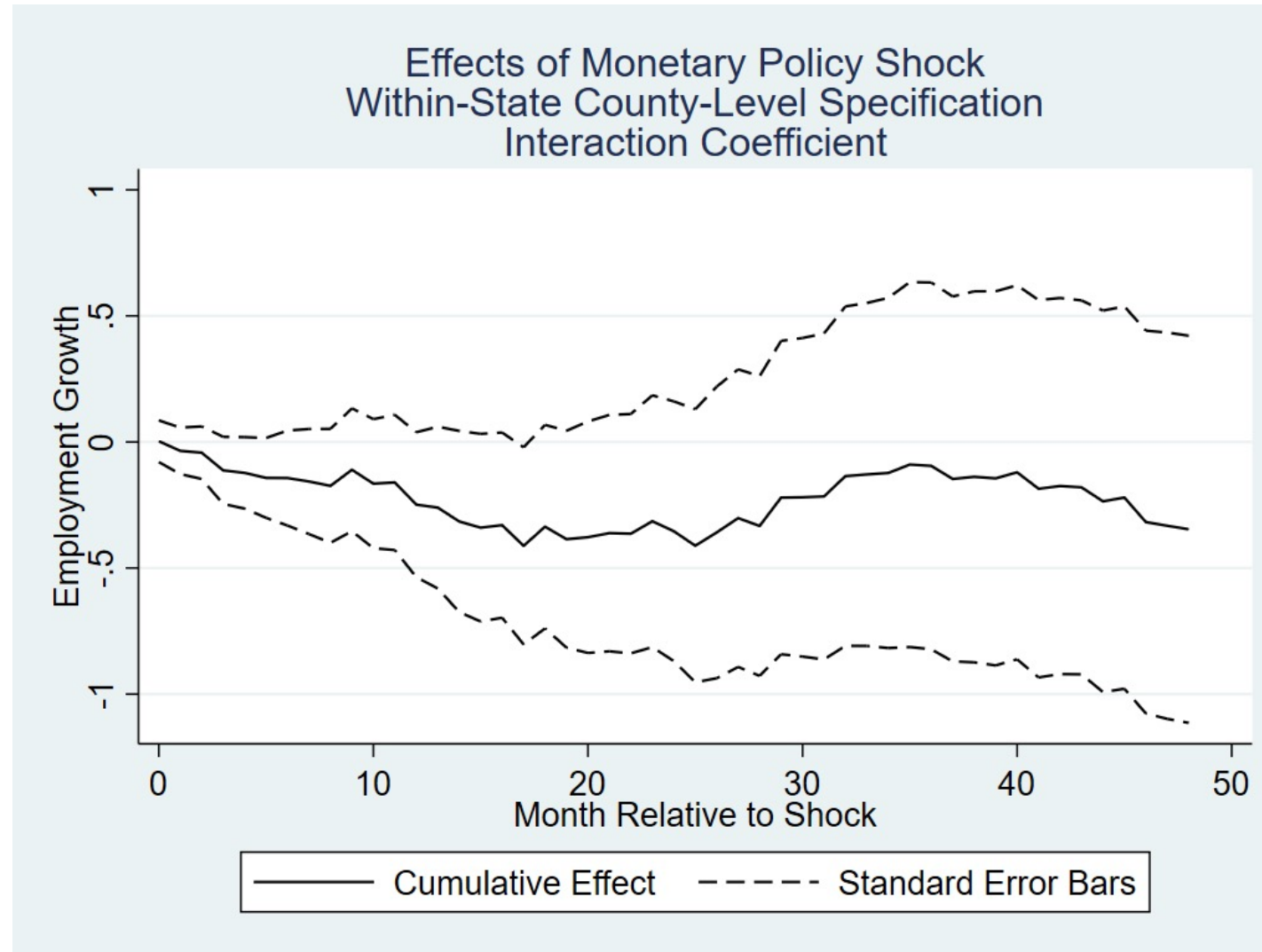
# Focusing on Time-Series Variation

- Conversely, we can shut down the cross-sectional variation and focus entirely on time-series variation by interacting the shock series with state FEs:

$$\Delta L_{s,t} = \sum_{j=0}^{48} \beta_j^{FFR} \cdot (ShareMin_{s,t} \#\# \Delta FFR_{t-j}) + \sum_{j=1}^{48} \beta_j^L \Delta L_{s,t-j} + \sum_{j=0}^{48} \gamma_j \cdot (\mathbf{1}\{State = s\} \#\# \Delta FFR_{t-j}) + \epsilon_{s,t}$$

Effects of Monetary Policy Shock on Employment
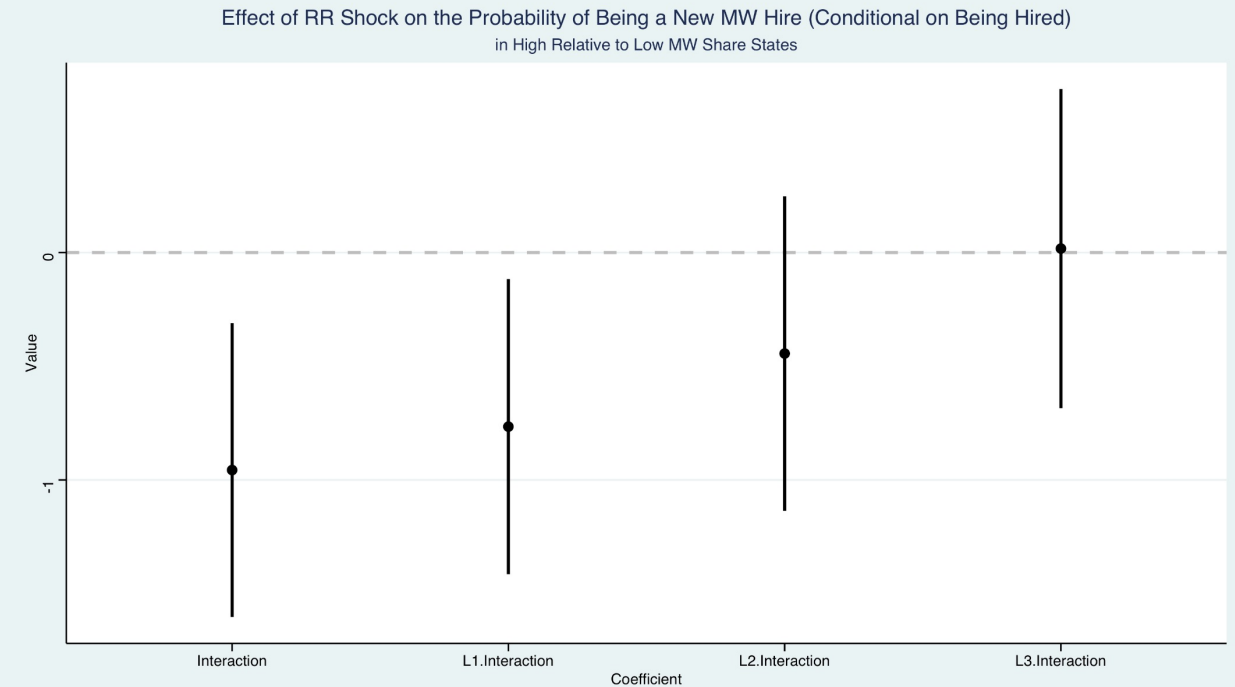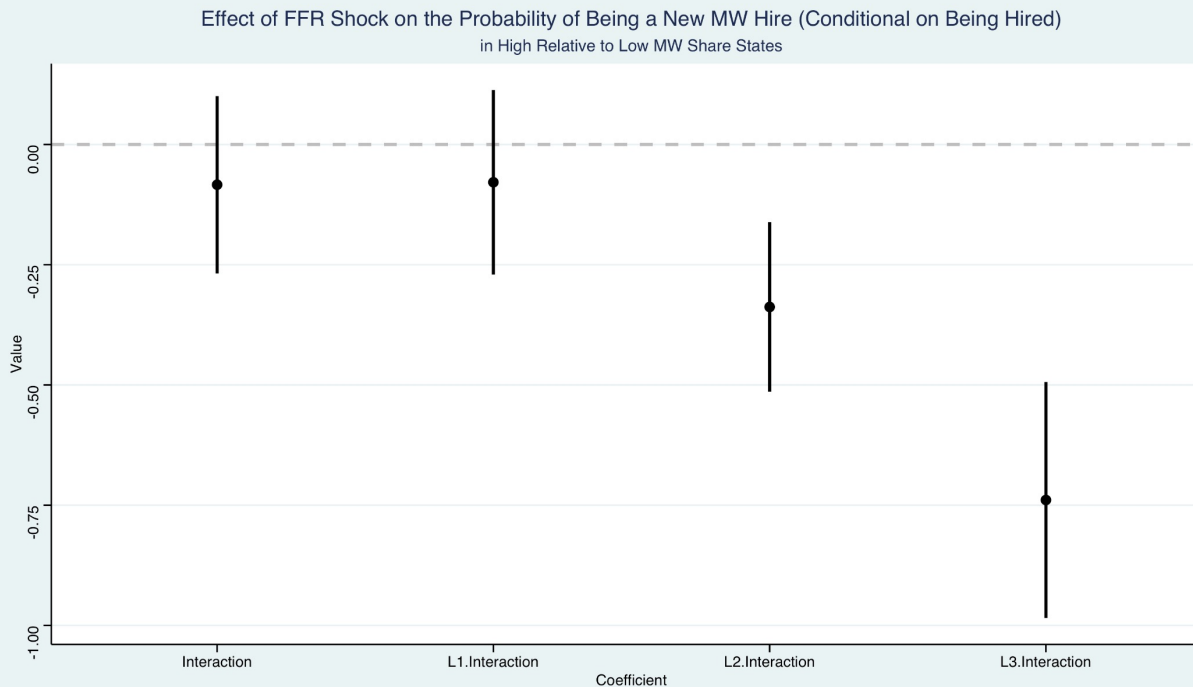Interaction Coefficient

# Testing the Mechanism: CPS Data

- The CPS is partially longitudinal in nature.
  - Households are present in the CPS for 4 months in a row, out of the CPS for 8 months, and then back in the CPS for another 4 months.
  - In the 4th month, individuals are asked a variety of questions about their employment and wage status – including hourly wage.
  - 12 months later, they are asked the same questions again.

- We can leverage this data to determine whether, indeed, expansionary monetary policy leads to new hires that are disproportionately minimum-wage workers.

$$\Delta L_{s,t} = ShareMin_{s,t} + \sum_{j=0}^{3} \beta_j^{FFR}(ShareMin_{s,t}\#\Delta FFR_{t-j}) + \vartheta_t + \eta_s + \epsilon_{s,t}$$

# Effect of Monetary Policy on Hiring of Minimum-Wage vs. Non-Minimum-Wage Workers



Effect of FFR Shock on the Probability of Being a New MW Hire (Conditional on Being Hired) in High Relative to Low MW Share States

Effect of RR Shock on the Probability of Being a New MW Hire (Conditional on Being Hired) in High Relative to Low MW Share States
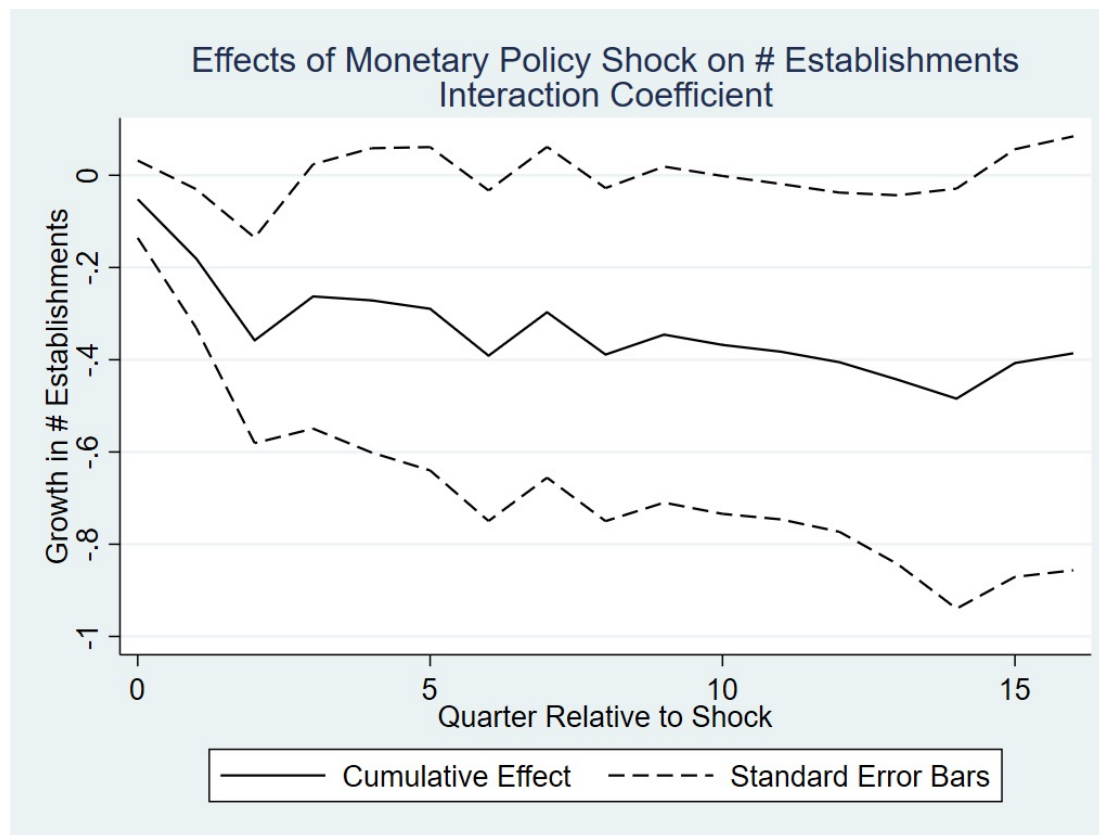
- While the timing differs slightly depending on which shock series is used, expansionary monetary policy does indeed lead to new hires being disproportionately minimum-wage workers.

# Establishments Results
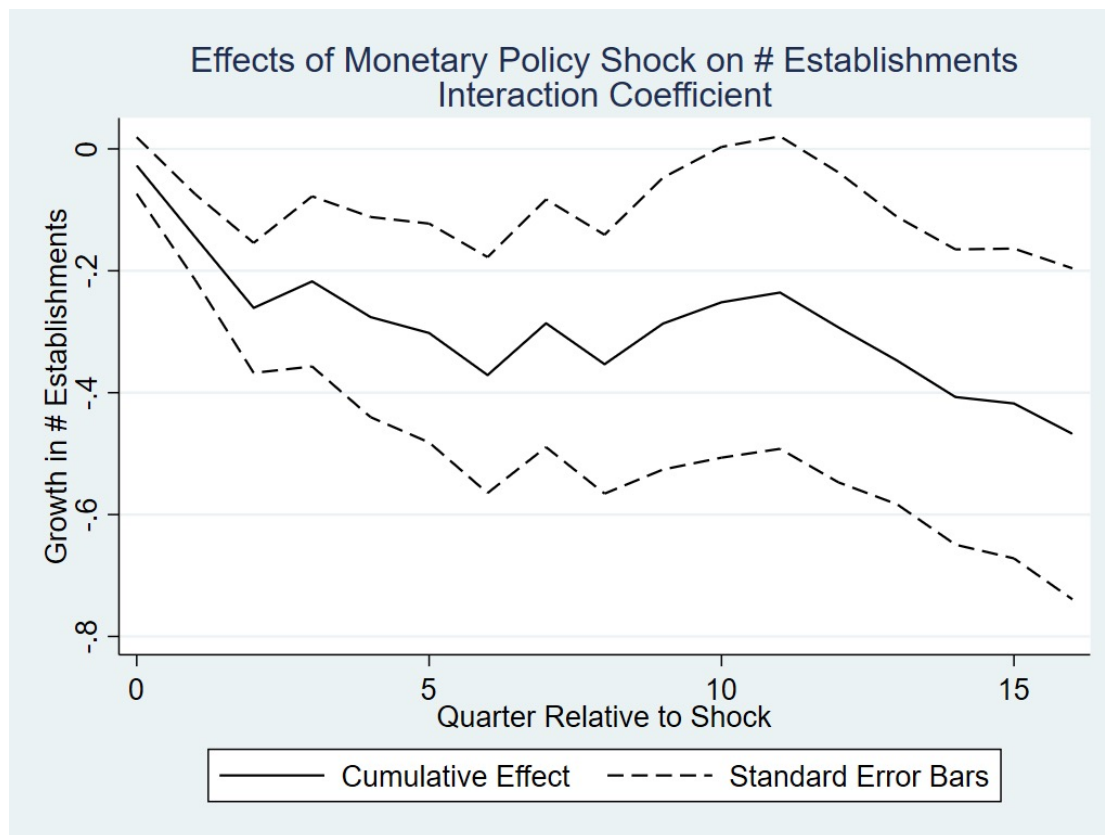


Baseline Specification

State/Time FE + Shift-Share Specification

- Some evidence of reduced business formation in response to contractionary shocks in places with higher minimum wage shares.

# Tradable/Non-Tradable Analysis

- Our model suggests a larger effect for tradables.

- If our empirical results are actually driven by differences in the MPC across places, we would expect the opposite (since non-tradables must be produced locally).

- Results we find are more consistent with our model.
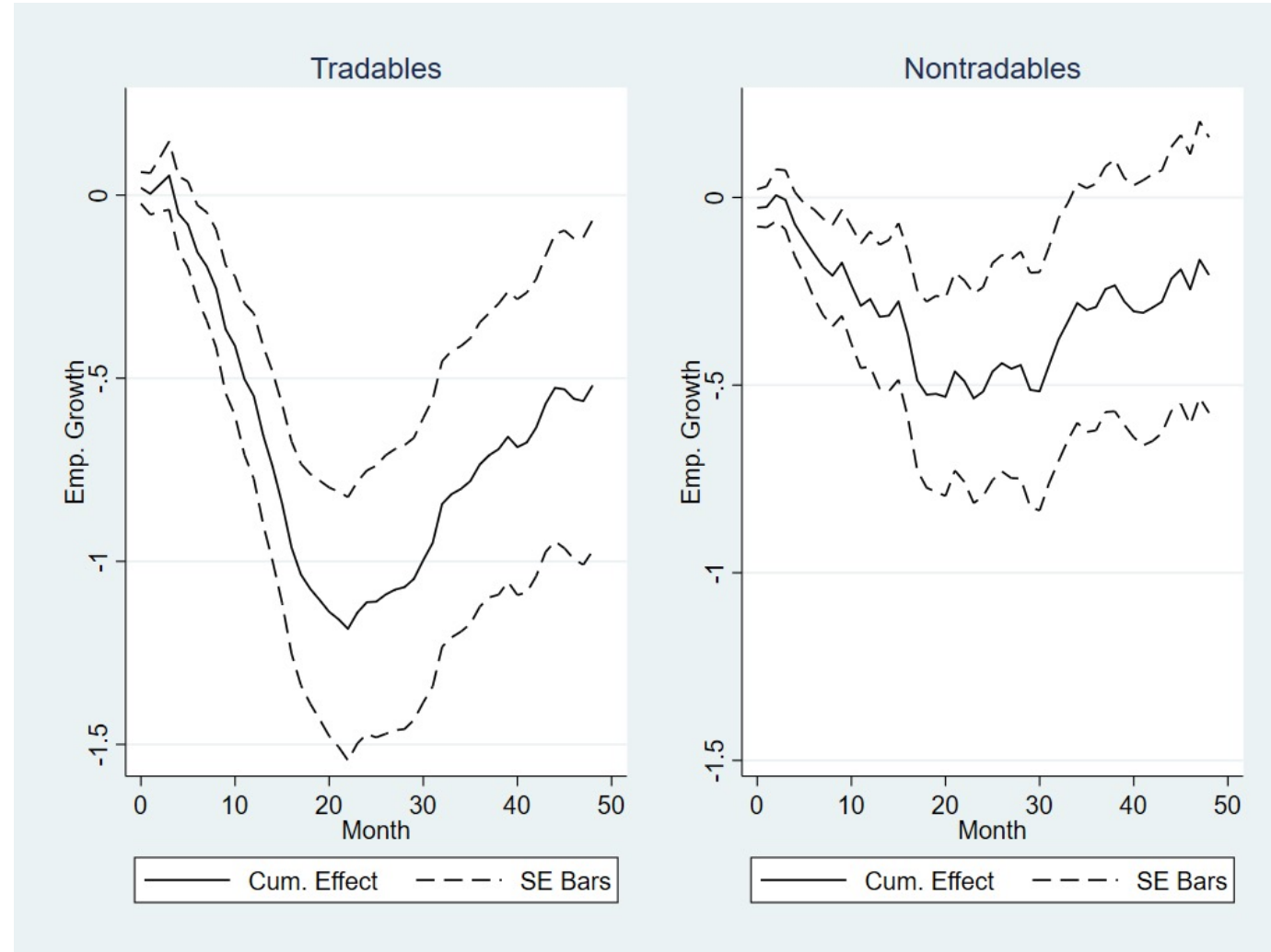
# Implications for Monetary Policy Efficacy

- The peak effect of a 1 pp monetary policy shock during the 1975-1990 period is a 2.8 pp reduction in employment.

- The majority of our empirical specifications have a peak interaction effect of approx. -0.5.
  - Average minimum-wage cost share over this period: 2.28%

- Implies that, over the 75-90 period, the minimum-wage channel of monetary policy is responsible for 41% of monetary policy's total effect.
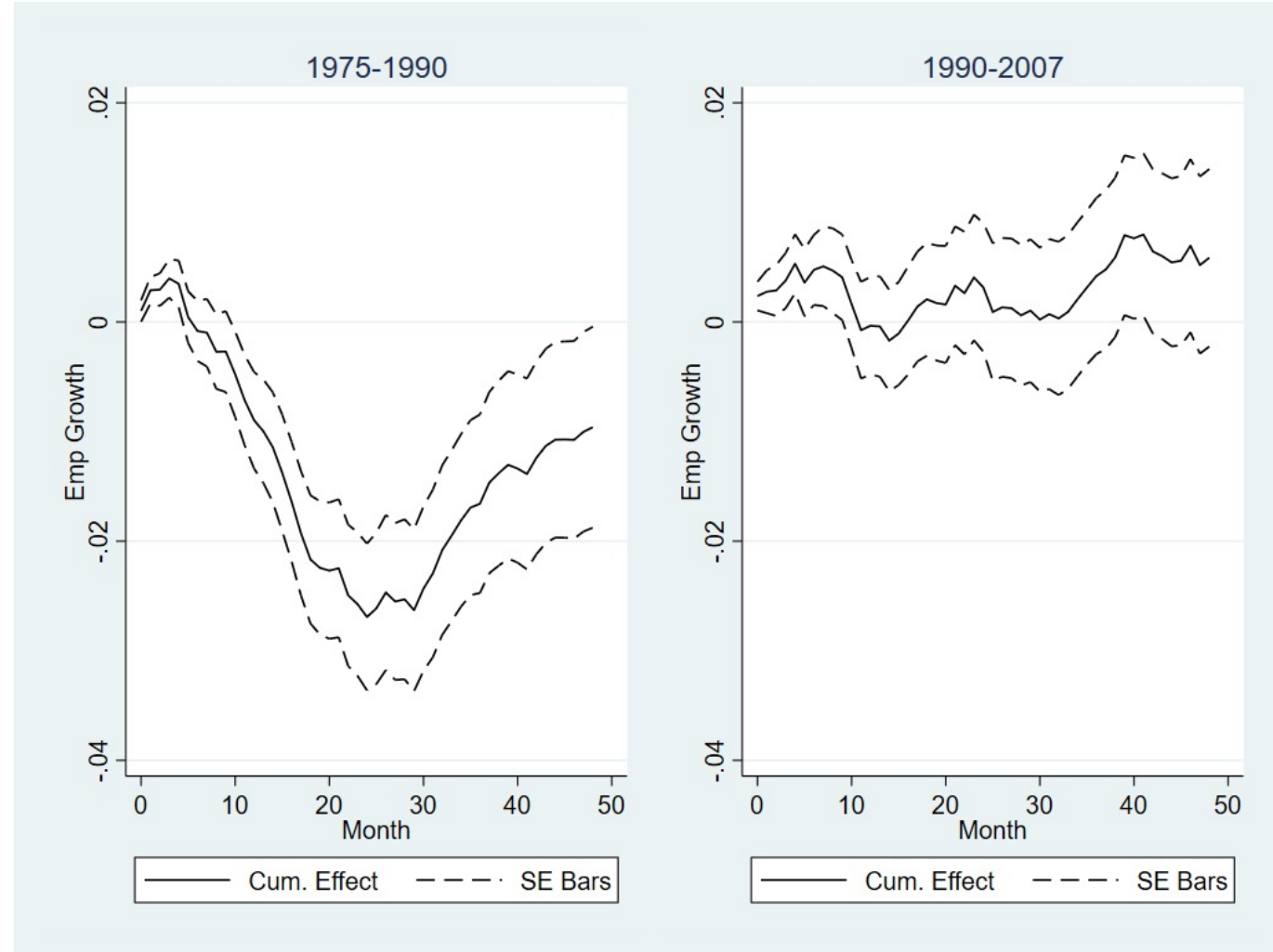
# Conclusion

- Minimum wages represent a legislatively sticky wage in the economy.

- Our model and empirical results show that the highest minimum wage share states could experience almost 4pp more employment growth than states without minimum wage workers.
  - This result reveals substantial heterogeneity in the employment effects of monetary policy across states and time.

- This channel may account for about 2/5 of the effect of monetary policy on employment in the 70s/80s, and it may help explain why the effect of monetary policy is falling over time.

# Thank You!