Labor Market Implications of Unemployment Benefit Extensions

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The Great Montreal Macro Event

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Introduction

- UI benefit extension is one of the most prominent and actively used countercyclical stabilization policies.
- In the U.S., UI benefits were extended during every recession since 1957.
- Following the onset of the Great Recession, there was an extension of unprecedented magnitude from 26 to 99 weeks.
- The Presidents' fiscal year 2016 budget argues that "the UI program is a key stabilizer during economic downturns" and calls for a dramatic expansion of the program so that federally financed benefit durations will rise automatically by up to 52 additional weeks in recessions.

What does economics profession know about the effects of unemployment benefit extensions and the mechanism through which they affect the economy? Surprisingly little...

Objectives

Consider the dramatic UI benefit extensions in the U.S. following the Great Recession.

Objective 1: Measure the economic consequences of this policy response.

Objective 2: Measure the importance of the impact of benefit extensions on search intensity and job acceptance decisions of unemployed – *the micro effect.*

Objective 3: Measure the importance of the equilibrium response of job creation to benefit extensions – *the macro effect.*

The Micro and Macro Effects

- Illustrative decomposition:

$$\text{Job finding rate} = \underbrace{s}_{\text{search intensity}} \times \underbrace{f(\theta)}_{\text{finding rate per unit of } s}$$

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- *The micro effect*: The effect of benefits on s.
  - Empirical micro literature assumed this is the only effect.
  - Used variation in benefit duration across U.S. states for identification.
  - Endogeneity problem: benefits extended when job finding rates are low.
  - Fix in the literature: control for state economic conditions by including state unemployment in regressions.
  - But state unemployment is itself endogenous. So interpretation of existing findings unclear.

The Micro and Macro Effects

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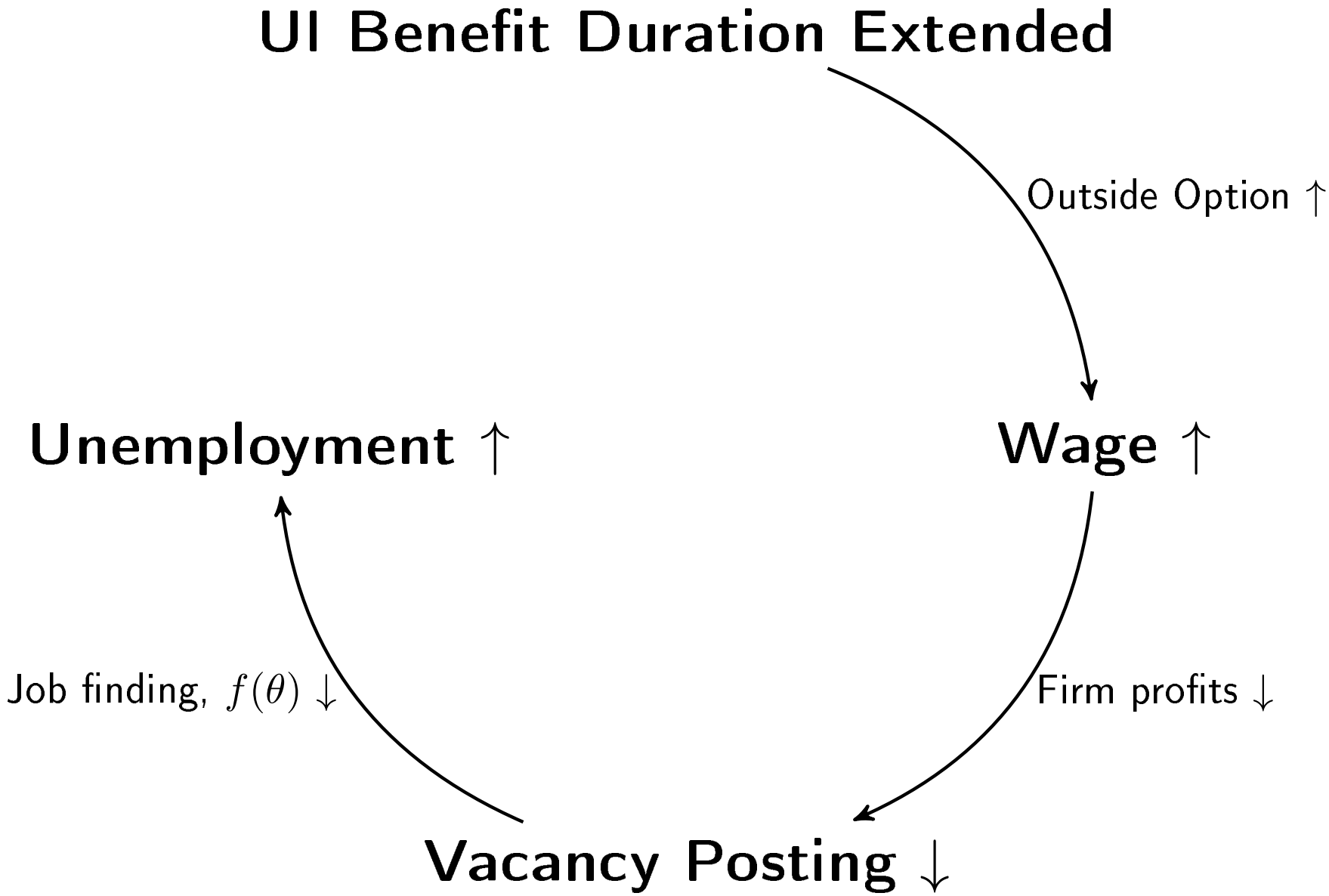
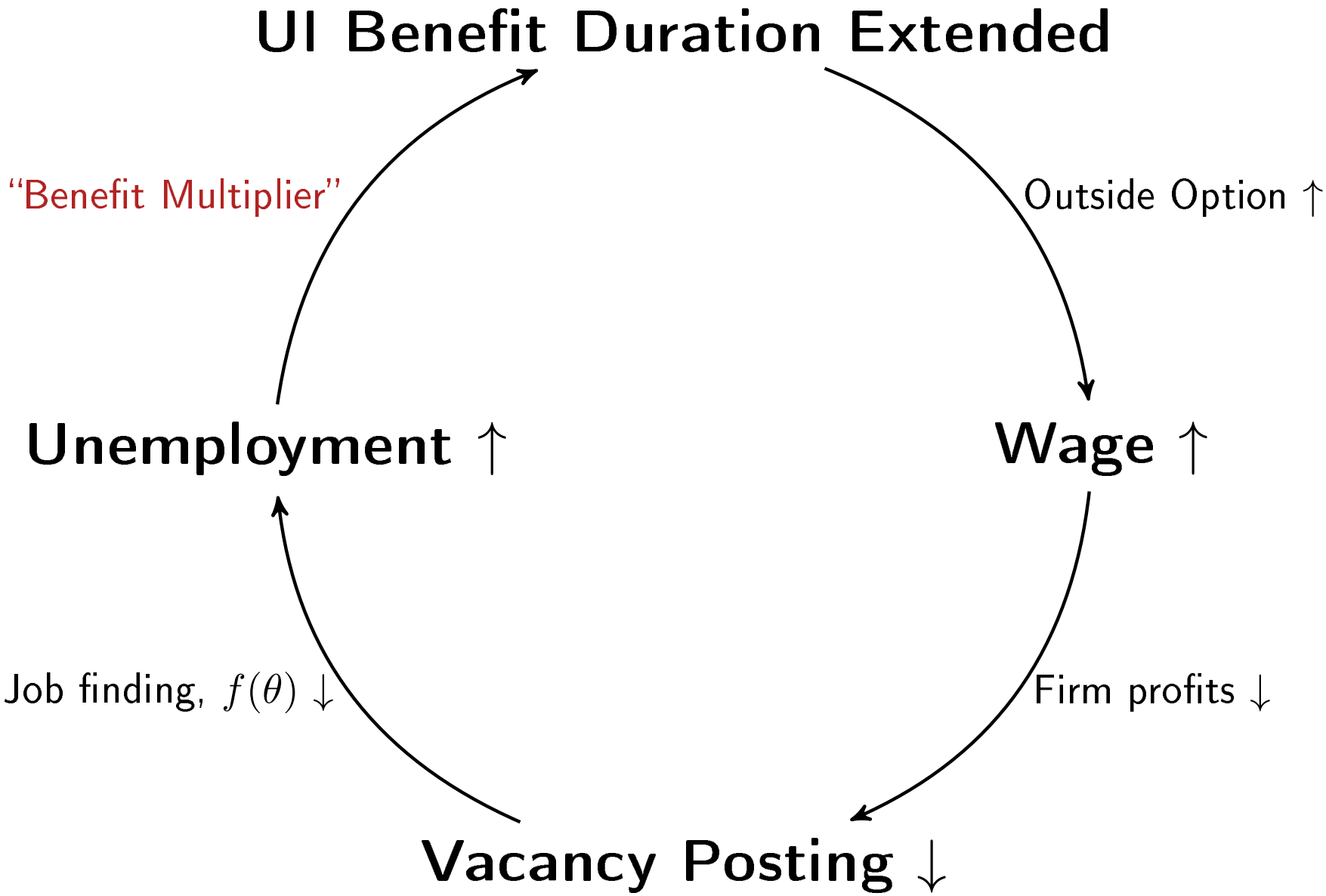
- *The macro effect*: The effect of benefits on $f(\theta)$.

The Micro and Macro Effects



The Micro and Macro Effects



The Micro and Macro Effects

- Illustrative decomposition:

$$\text{Job finding rate} = \underbrace{s}_{\text{search intensity}} \times \underbrace{f(\theta)}_{\text{finding rate per unit of } s}$$

- *The micro effect*: The effect of benefits on s.
- *The macro effect*: The effect of benefits on $f(\theta)$.
  - Logic: UI Benefit extended $\Rightarrow$ Equilibrium Wage $\uparrow \Rightarrow$ Vacancy Creation $\downarrow \Rightarrow$ Unemployment $\uparrow$.
  - Macro studies: Millard and Mortensen, ...
  - These studies rely on model structure and estimated values of key parameters, e.g. flow utility of the unemployed.
  - We aim to provide more direct empirical evidence on the impact of unemployment benefits on unemployment, employment, vacancies, and wages.

Plan

1. How large are the effects in the data?
   - Based on "The Impact of Unemployment Benefit Extensions on Employment: The 2014 Employment Miracle?" by Hagedorn, Manovskii and Mitman

2. The impact of benefits on worker search intensity.
   - Based on "Unemployment Benefits and unemployment in the Great Recession: The Role of Micro Effects" by Hagedorn, Manovskii and Mitman

3. The role of general equilibrium effects.
   - Based on "Unemployment Benefits and unemployment in the Great Recession: The Role of Macro Effects" by Hagedorn, Karahan, Manovskii and Mitman

The Impact of Unemployment Benefit Extensions on Employment: The 2014 Employment Miracle?

Marcus Hagedorn[1] Iourii Manovskii[2] Kurt Mitman[3]

[1]University of Oslo

[2]University of Pennsylvania

[3]IIES, Stockholm University

Motivation

- Objective: assess the effect of unemployment benefit extensions on employment.
- The size and even the sign of this effect are not known.
  - *Decision Theory*: sign is ambiguous. Some unemployed search harder, others drop out of the labor force.
  - *Quantitative Macro*: equilibrium response of job creation crucial, but its size depends on hard to identify parameters.
  - *Empirical Micro*: laser-sharp focus on the effects of benefits on search intensity of individual workers. Much too narrow a focus to infer the effect on employment.
  - *All Literatures*: ignore the response of participation decisions of those out-of-labor force (account for 60% of new employees, on average).
- Approach: measure directly the employment effects of a large U.S.-wide cut in benefit duration in December 2013.

The Policy and the Reform

- States typically provide 26 weeks of UI benefits.
- In June 2008 Congress enacted federal Emergency Unemployment Compensation Program (EUC08).
- The scale of the program varied over time and at its peak provided up to 99 weeks of benefits (26 State + 73 federally paid extensions).
- Program reauthorized 12 times prior to 2013.
- In December 2013 Congress unexpectedly did not reauthorize the program.
- Average duration of benefits across US states fell with immediate effect from 53 weeks to 25 weeks.

The Policy and the Reform

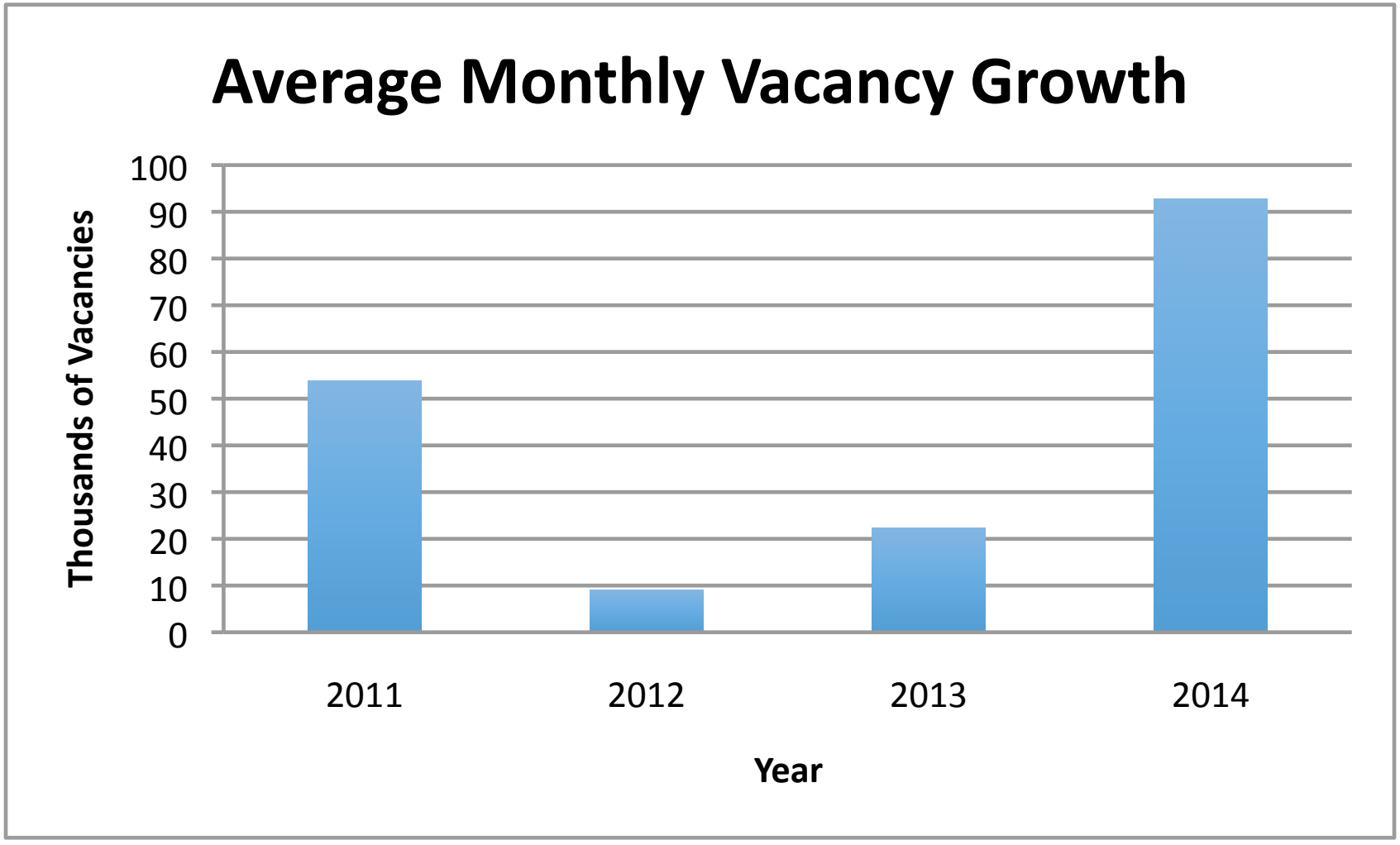
Congress' decision unexpected...

- U.S. unemployment rate was higher and
- the long-term unemployment rate was over twice as high as it was at the expiration of any previous EUC program.

... and counter to conventional wisdom and economists' advice:

- Labor Economists: Without benefits unemployed workers will stop searching for jobs and will exit the labor force.
- House Dem. Leader Pelosi: extending federal unemp. benefits is "one of the best ways to grow the economy."
- Nonpartisan Congressional Budget Office: EUC08 is among policies with "the largest effects on output and employment per dollar of budgetary cost."
- Council of Economic Advisors: 240,000 jobs would be lost in 2014 because of negative impact on aggregate demand.

What Actually Happened in 2014?



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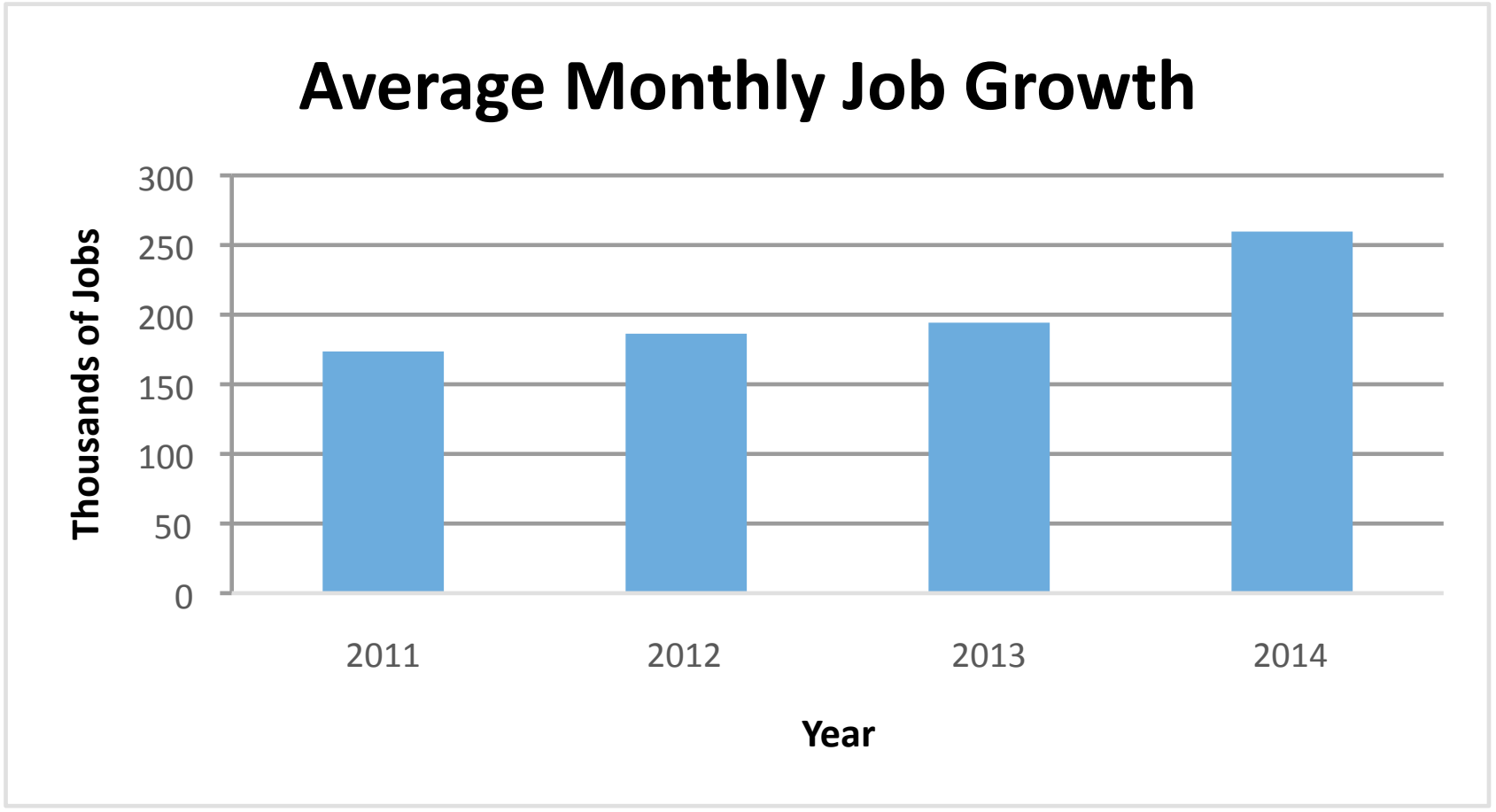

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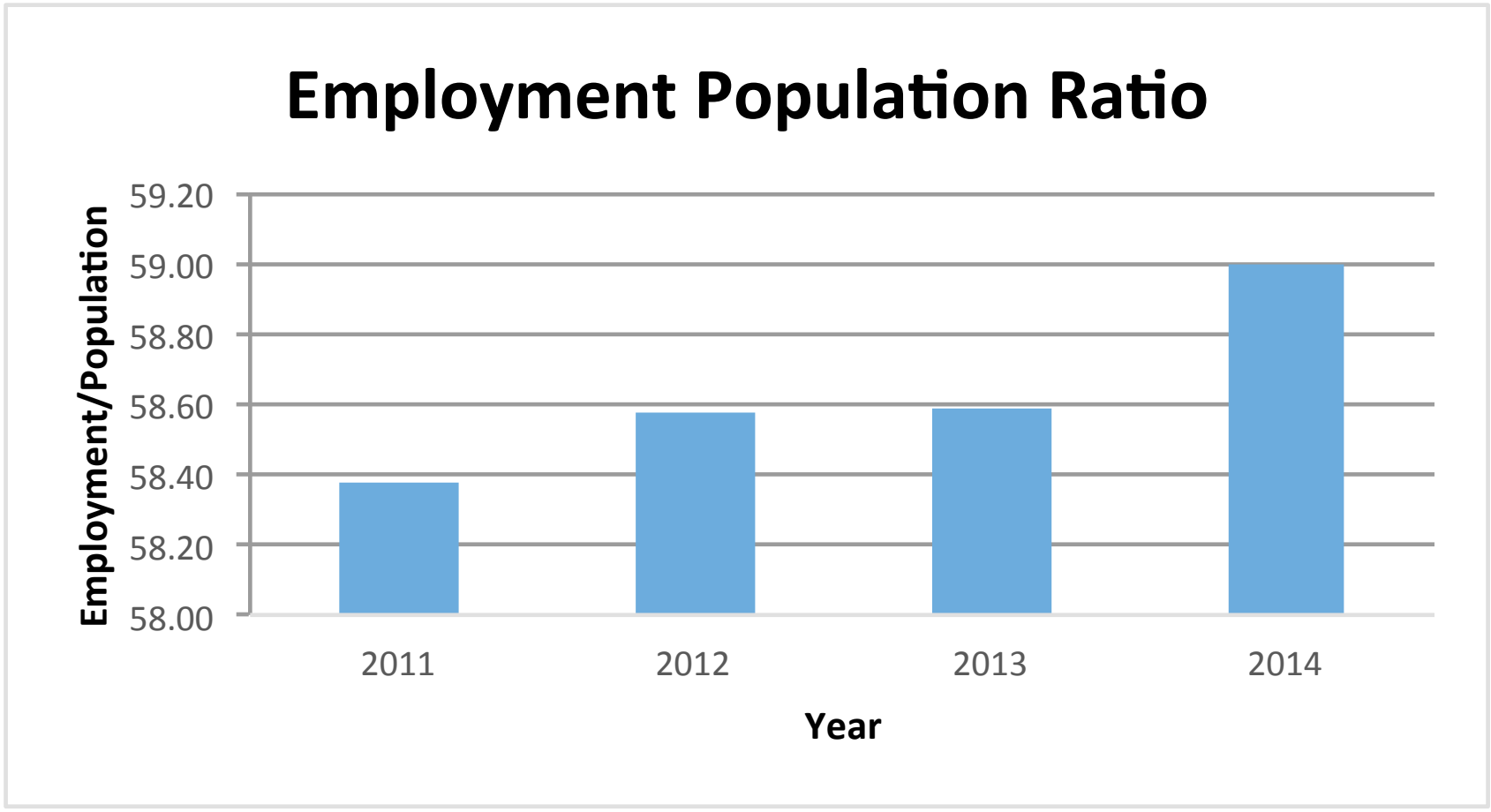

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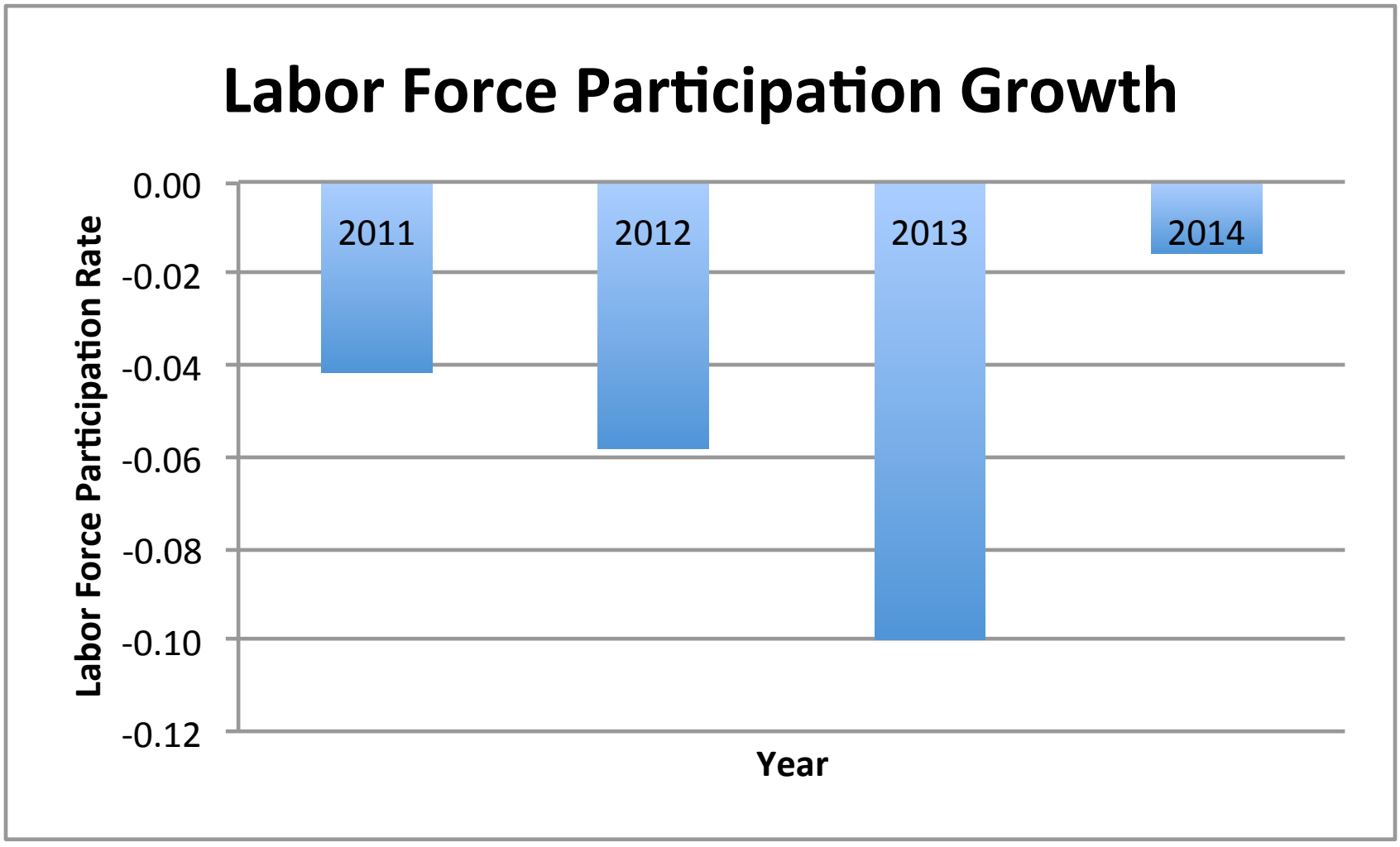

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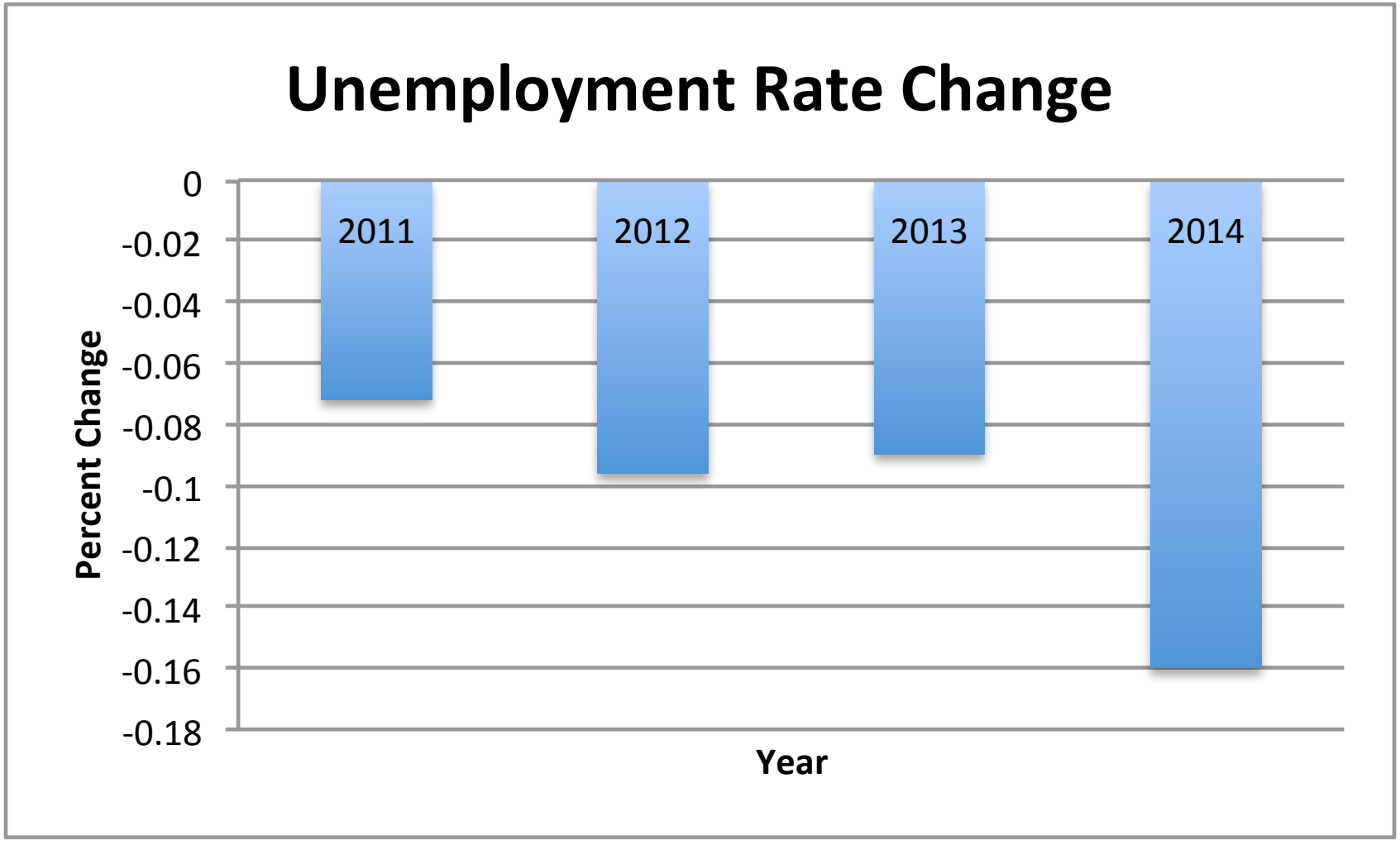
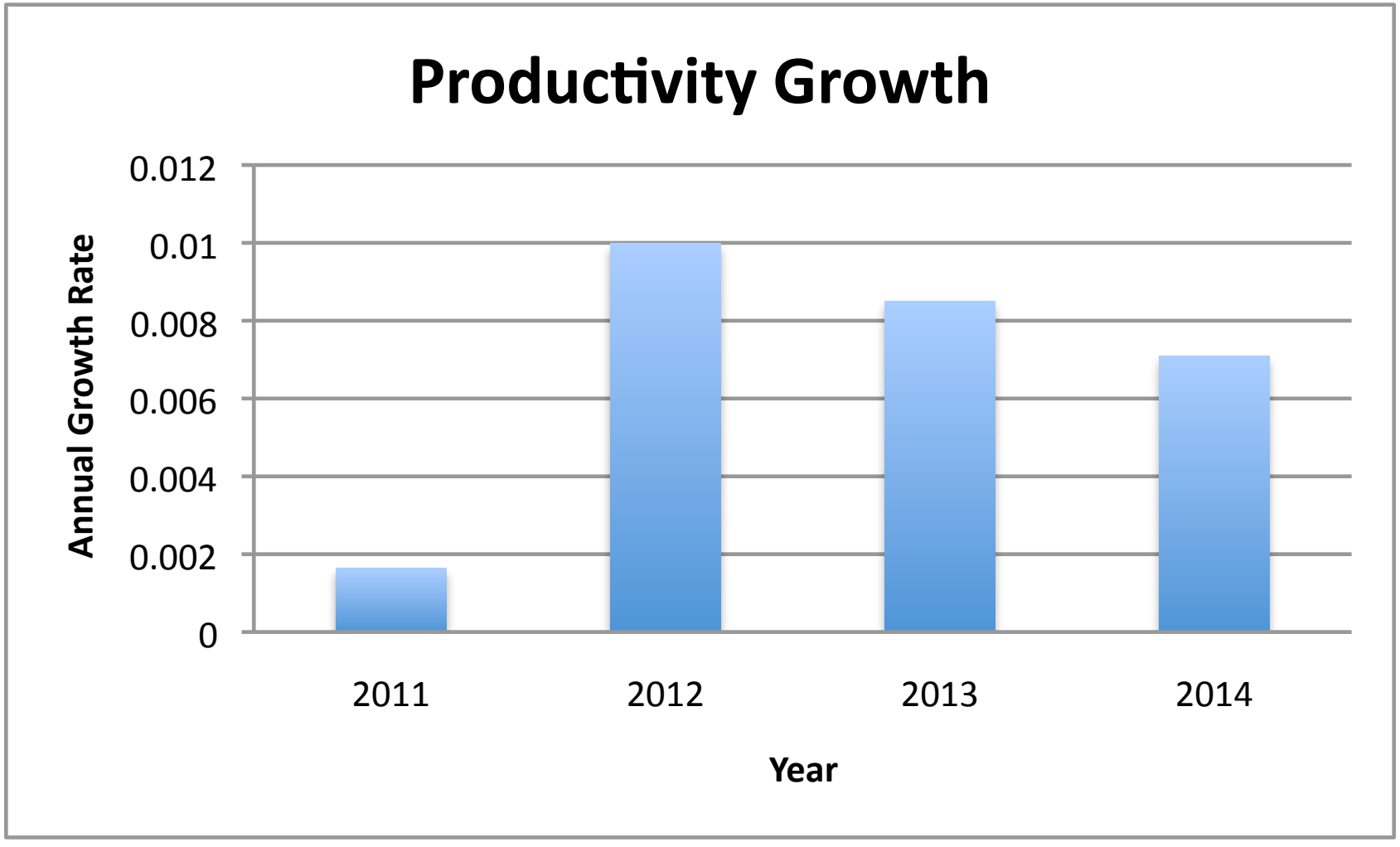


Is Productivity Growth behind 2014 Employment Miracle?



Did the UI Reform Cause 2014 Employment Miracle?

- No other significant reforms at the same time.
- Still hard to rule out some aggregate shock coincidental with the reform.
- Empirical Strategy: use disaggregated data.
  - States qualify for federal extensions depending on menu of "triggers" that states write in their legislation and on state unemployment rate.
  - Wide heterogeneity of federal extensions ranging from 0 to 47 weeks right before the reform.
  - Expiration endogenous to *aggregate* conditions, but *exogenous* to cross-sectional differences across states.

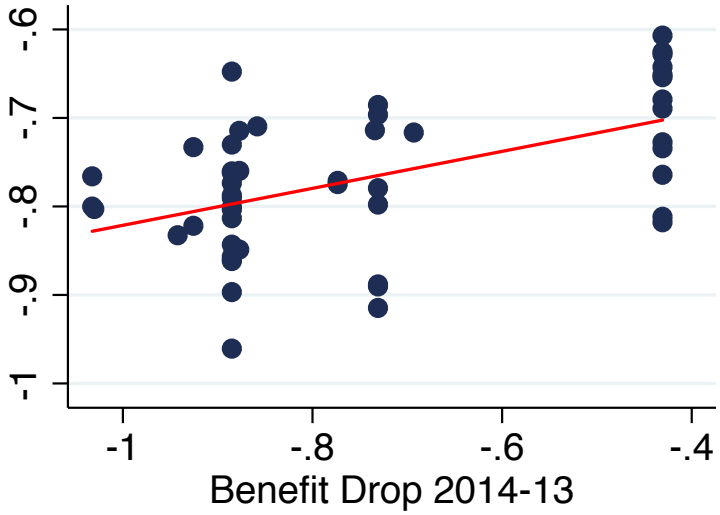
Benefit Duration Across States: December 2013

Weeks of Benefits	States
73 weeks	Illinois, Nevada, Rhode Island
63 weeks	Alaska, Arizona, California, Connecticut, Delaware, DC, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New York, Ohio, Oregon, Pennsylvania, Tennessee, Washington
61 weeks	Arkansas
57 weeks	Michigan
54 weeks	Alabama, Colorado, Idaho, Maine, New Mexico, Texas, West Virginia, Wisconsin
49 weeks	Missouri, South Carolina
44 weeks	Georgia
40 weeks	Florida, Hawaii, Iowa, Kansas, Minnesota, Montana, Nebraska, New Hampshire, North Dakota, Oklahoma, South Dakota, Utah, Vermont, Virginia, Wyoming
19 weeks	North Carolina

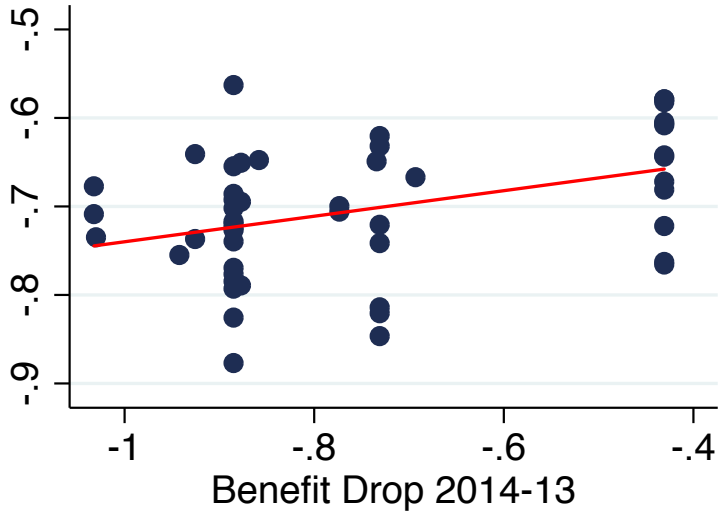
Key Methodological Challenge

- While the cut in benefit duration was exogenous to economic conditions in a state, the magnitude of the cut was not.
  - Benefit duration prior to the cut depended on state economic conditions.
- Key challenge: Inference on counterfactual employment trends across states in the absence of the reform.

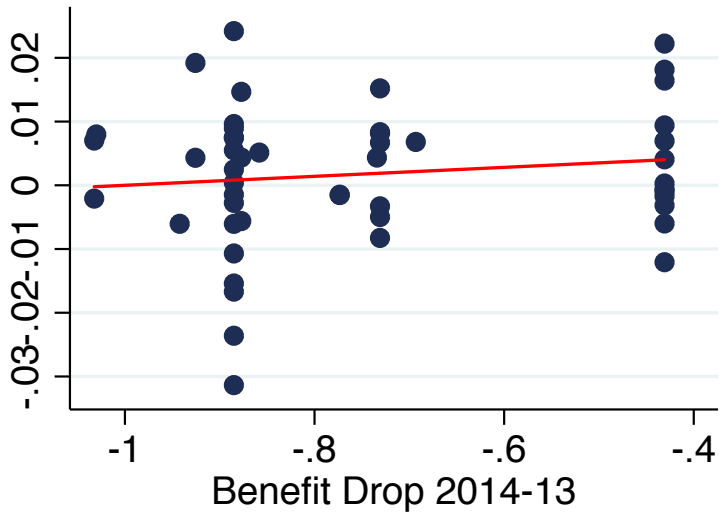
Key challenge to identification



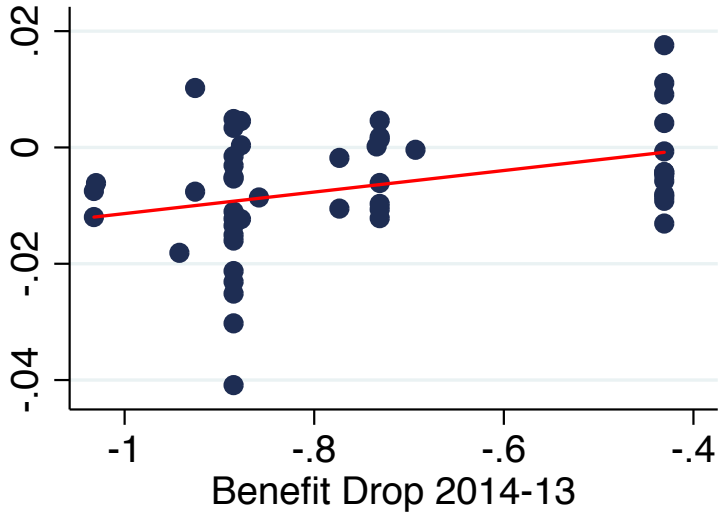
(a) Employment 2014Q3



(b) Labor Force 2014Q3



(c) Employment Growth 2013

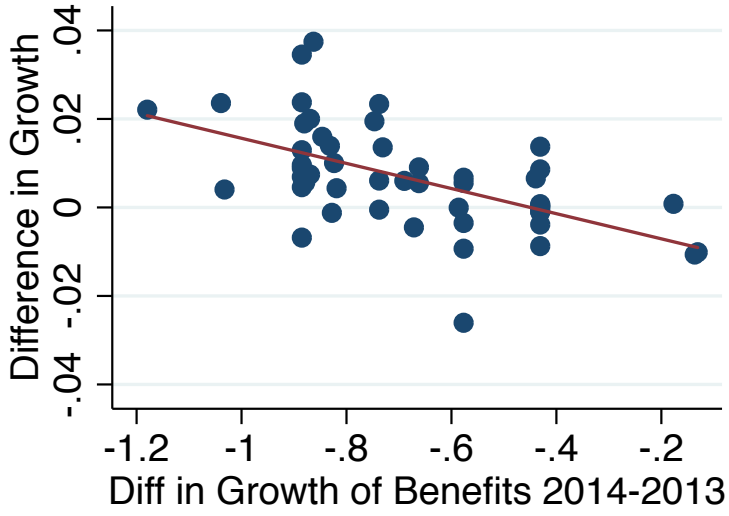


(d) Labor Force Growth 2013

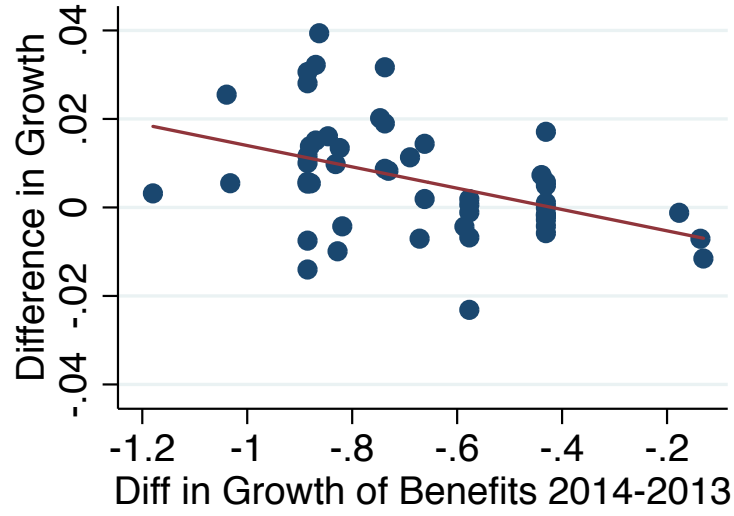
Simplest control for trends

- Plot the change in growth rate of E/P and L/P between 2014 and 2013 against change in growth of benefits over same period
- Takes out state-specific linear trends
- Compute for panel of states and then difference between states that border each other

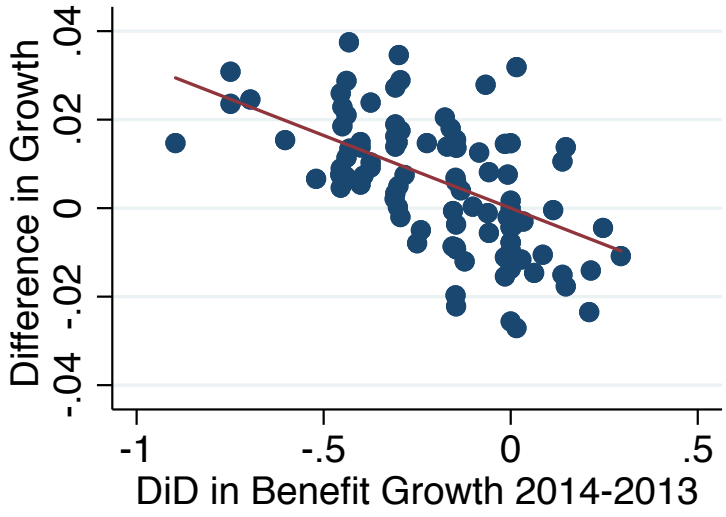
Simplest control for trends: Diff-in-diff



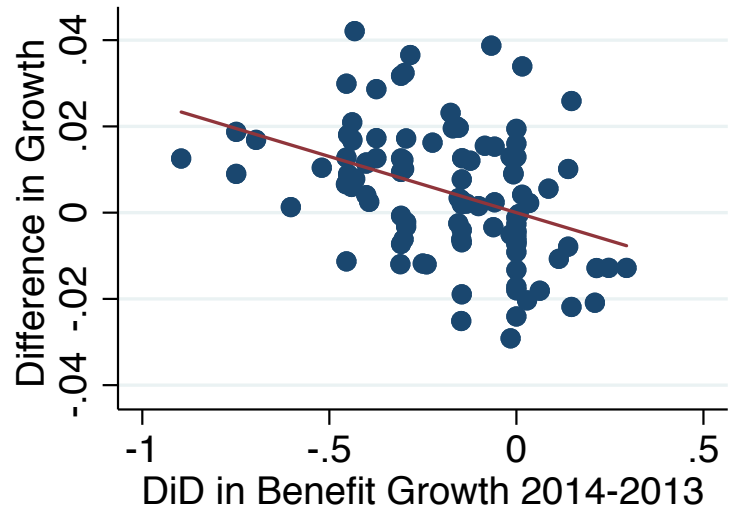
(a) Employment States



(b) Labor Force States



(c) Employment State Borders



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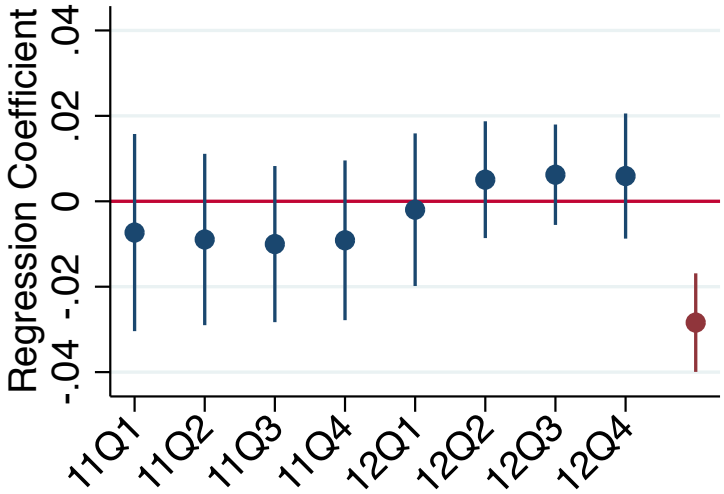
How unusual are these dynamics?

- Plot the regression coefficient associated with previous scatterplots for all quarters 2011Q1-2012Q4
- For previous years use "placebo" cut in benefits - as if the benefit cut had happened that quarter

How unusual are these dynamics?



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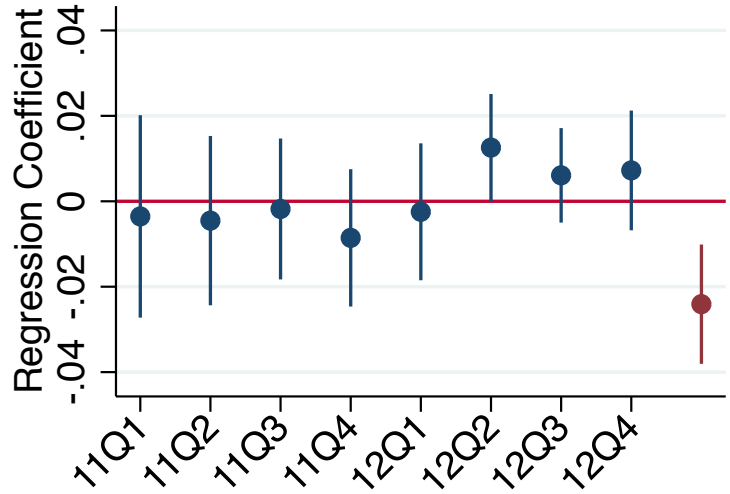

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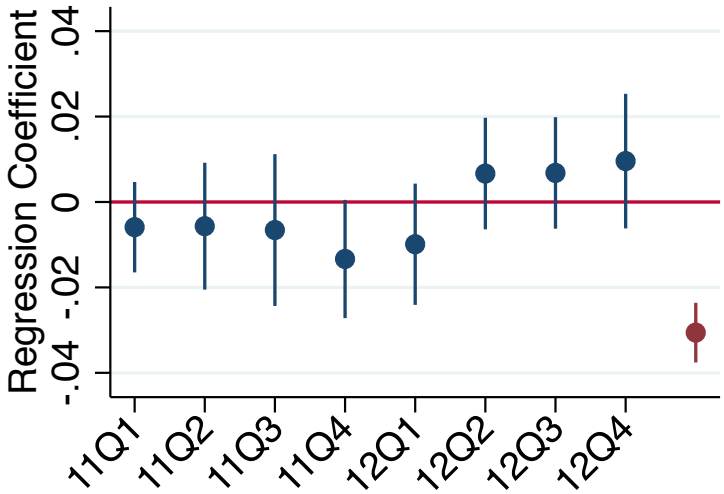

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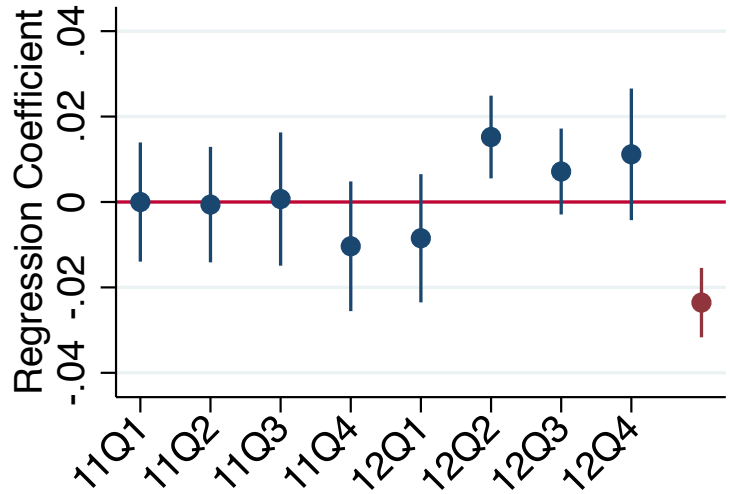
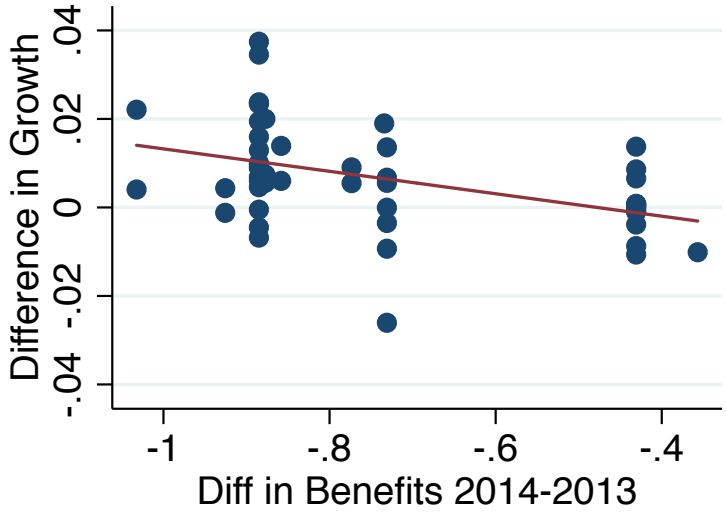


(d) Labor Force State Borders

What about mean reversion?

- So far, shown plots that show difference in growth rates of E/P and L/P vs difference in growth rates of benefits
- Mean reversion could explain it because benefits a function of state conditions
- Plot diff in growth rates of E/P and L/P vs drop in benefits between 2014 and 2013

What about mean reversion?



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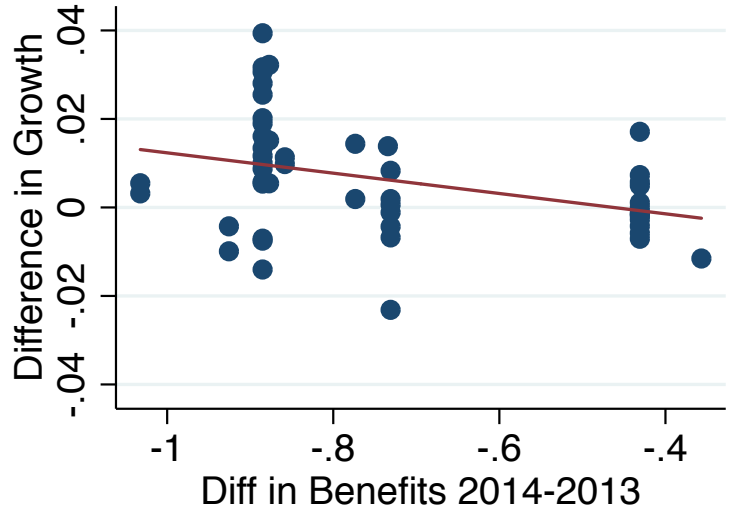

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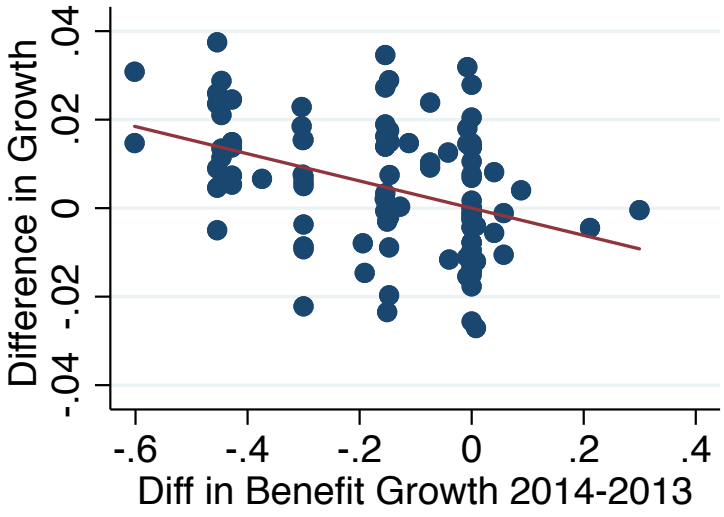

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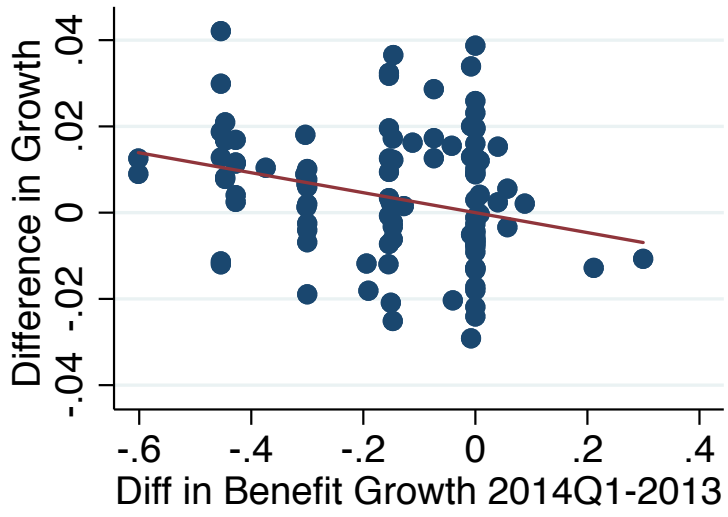

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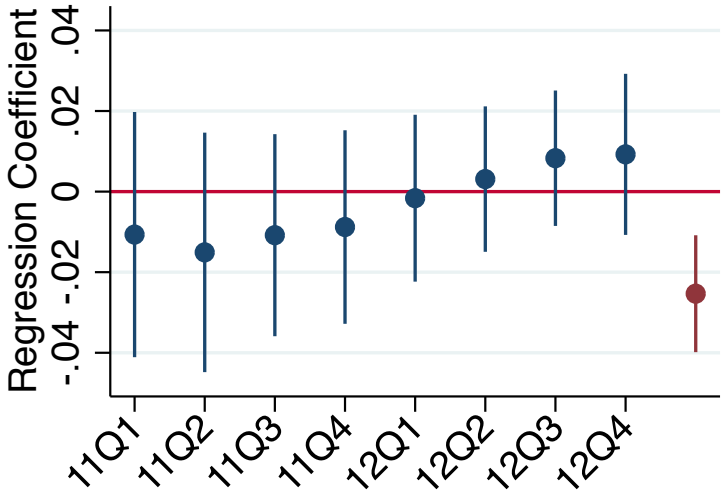
How unusual are these dynamics?

- Plot the regression coefficient associated with previous scatterplots for all quarters 2011Q1-2012Q4
- For previous years use placebo cut in benefits - as if the benefit cut had happened that quarter
- Will clarify if states with high benefits have a "tendency" to grow faster over subsequent year

How unusual are these dynamics?



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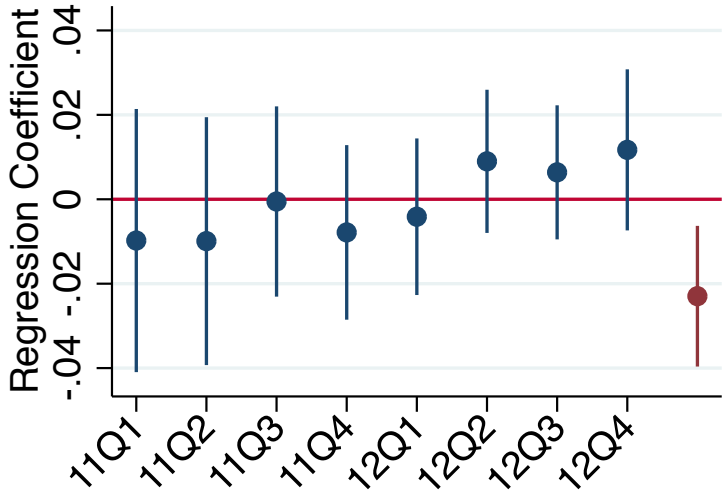

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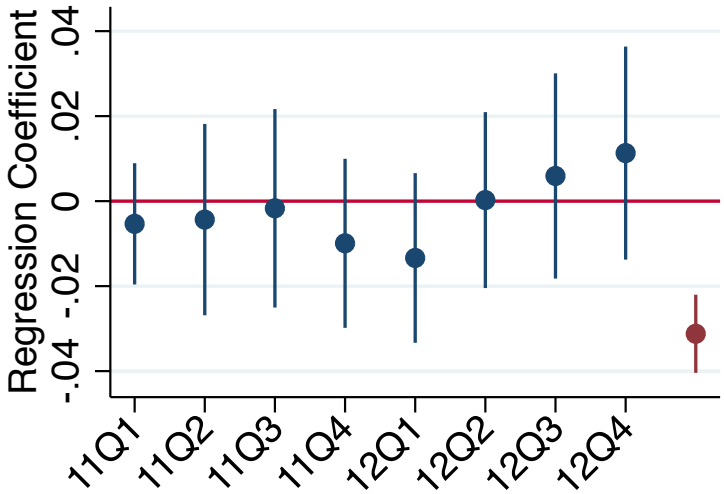

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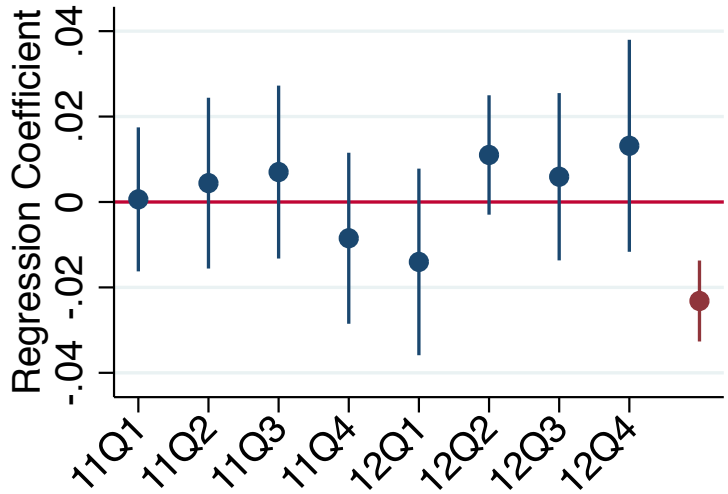


(d) Labor Force State Borders

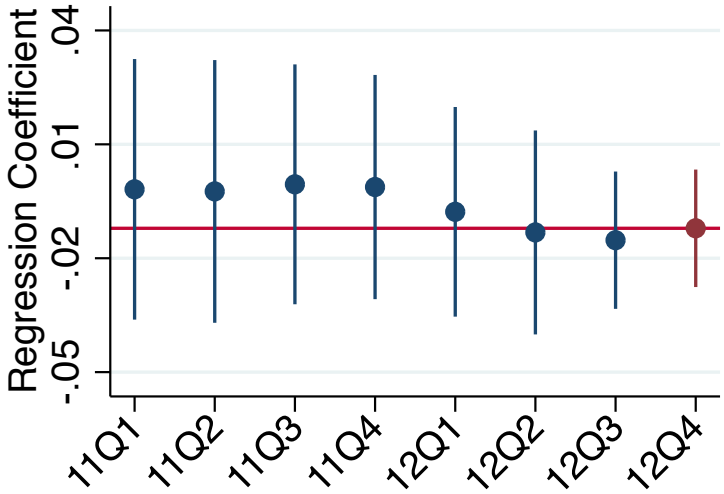
What about longer pre-trends?

- Showed acceleration of E/P and L/P growth deviation from 2013 trend
- Can check for longer trends by taking "long difference":

$$\Delta_{i,\tau} = (x_{i,2014Q4} - x_{i,2013Q4}) - (x_{i,2013Q4} - x_{i,2012Q4-\tau}) \quad (1)$$

  for $\tau = 0, ..., 11$, where x is E/P or L/P
- We regress $\Delta_{i,\tau}$ on the drop in benefits between 2014 and 2013.

What about longer pre-trends?



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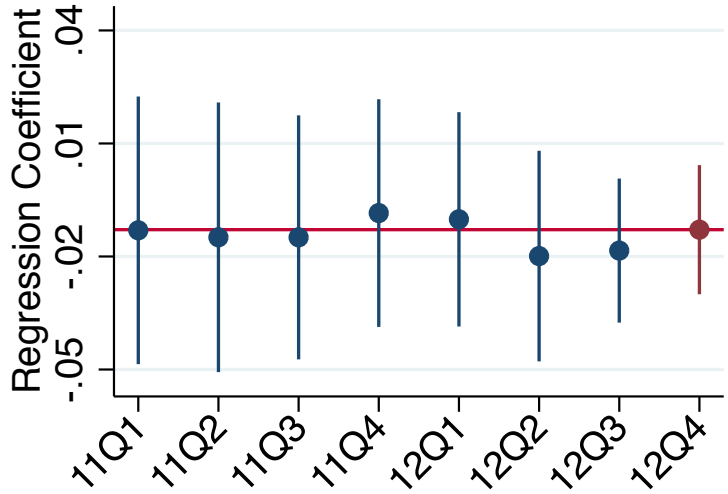

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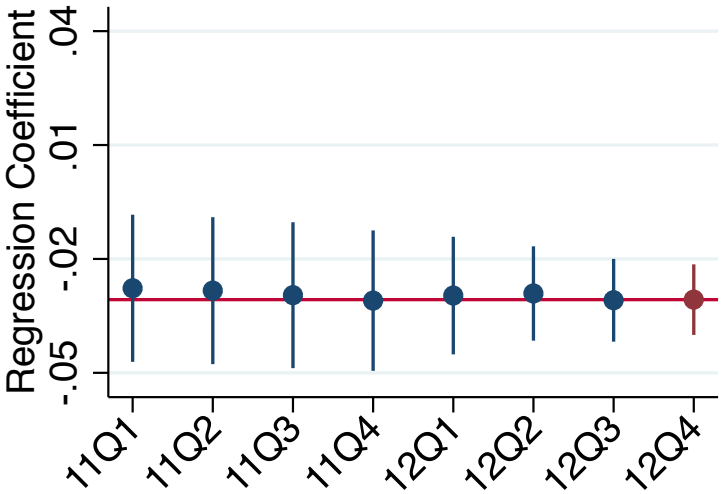

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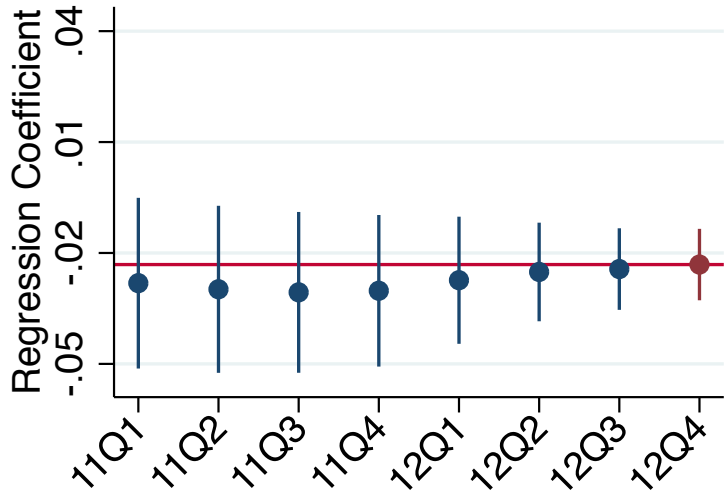


(d) Labor Force State Borders

Empirical Methodology

$$
\begin{aligned}
x_{i,t} &= \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) \\
&+ \sum_{j=1}^{n} \gamma_j x_{i,t-j} + \nu_t \tilde{x}_{i,2013Q4} + \eta_i + \delta_t + \epsilon_{i,t},
\end{aligned}
$$

- $x_{i,t}$ is outcome variable (e.g. $\log(E/P)$) in state i at time t.
- $b_{i,t}$ weeks of benefits
- n is the number of lags included
- η_i is a state fixed effect
- δ_t is an aggregate time effect
- $\nu_t \tilde{x}_{i,2013Q4}$ is a state-specific time trend, $\tilde{x}_{i,2013Q4}$ is the deviation of the outcome variable (EP or LFP) in each state in 2013Q4 from the the cross-sectional mean in that quarter
- $\epsilon_{i,t}$ error term
- β_τ coefficients on benefit drop

Empirical Methodology

- Cumulative effect of the expiration of the policy, $\tilde{\beta}_\tau$, take into account the dynamic propagation via the estimated lag structure.
- Cumulative effect in Q1 given by dummy:

$$\tilde{\beta}_1 = \beta_1.$$

- Cumulative effect in Q2, Q2 dummy + dynamic effect via lag from Q1:

$$\tilde{\beta}_2 = \beta_2 + \gamma_1 \tilde{\beta}_1.$$

- Thus, we can define the cumulative effects recursively as

$$\tilde{\beta}_m = \beta_m + \sum_{j=1}^{\min\{n, m-1\}} \gamma_j \tilde{\beta}_{m-j},$$

Identifying Assumption

- Identifying assumption is standard OLS conditional mean:

$$E[\varepsilon_{it} \mid \mathbf{1}_{t=2014Q\tau}(b_{i,t}-b_{i,2013Q4}), \{x_{i,t-j}\}_{j=1}^{n}, \nu_t\tilde{x}_{i,2013Q4}, \eta_i, \delta_t] = 0.$$

- Potential endogeneity problem: initial level of $b_{s,t}$ *was* a function of state-level factors

- This could fail if level of benefits at the end of 2013 correlated with (counterfactual) state level growth rates differences in 2014

Identifying Assumption

- Suppose we had assumed a simple specification:

$$x_{i,t} = \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) + \xi_{i,t},$$

- Problem: If US labor market recovering with E increasing in all states.

Identifying Assumption

- Suppose we had assumed a simpler specification:

$$x_{i,t} = \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) + \delta_t + \xi_{i,t},$$

- δ_t captures the US wide evolution of the labor market.
- Problem: permanent differences in employment across states which might be correlated with benefits.

Identifying Assumption

- Suppose we had assumed a simple specification:

$$x_{i,t} = \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) + \delta_t + \eta_i + \xi_{i,t},$$

- η_i control for permanent differences across states.
- Problem: Mechanical way in which benefits are set

$$b_{i,2013Q4} = G(\{x_{i,2013Q4-j}\}_{j=1}^{k}).$$

- If E is mean-reverting and recovery still ongoing in 2013/2014, bias may arise.

Identifying Assumption

- Suppose we had assumed a simple specification:

$$\begin{aligned} x_{i,t} &= \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) \\ &+ \sum_{j=1}^{n} \gamma_j x_{i,t-j} + \delta_t + \eta_i + \xi_{i,t}, \end{aligned}$$

- $\sum_{j=1}^{n} \gamma_j x_{i,t-j}$ controls for these dynamic adjustments.
- Problem: Treatment may be correlated with state trends.

Identifying Assumption

- Benchmark specification:

$$\begin{aligned} x_{i,t} &= \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) \\ &+ \sum_{j=1}^{n} \gamma_j x_{i,t-j} + \nu_t \tilde{x}_{i,2013Q4} + \delta_t + \eta_i + \epsilon_{i,t}, \end{aligned}$$

- $\nu_t \tilde{x}_{i,2013Q4}$ directly addresses the concern
- Problems: None! Will verify.

Results

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
EMP/POP	-0.00418***	-0.0107***	-0.0169***	-0.0214***
	(0.000852)	(0.00228)	(0.00386)	(0.00545)
LF/POP	-0.00313***	-0.00673***	-0.0105***	-0.0145***
	(0.000989)	(0.00212)	(0.00354)	(0.00509)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Aggregation

- Baseline estimate reflects the effect of UI on employment at the state-level.
- Would also like to predict effect of nation-wide extension.
- Concern: economic activity may reallocate across states.
- This reallocation is picked up by our estimates but will be absent when the policy is changed everywhere.
- Patterns in the data:
  1. Large negative effects of UI extensions on employment in sectors commonly considered non-tradable and thus not subject to reallocation.
  2. Workers living close to state borders do not change the strategy of which state to look for work in response to changes in benefits

Implications for Employment

Previous results $\Rightarrow$ can use a standard trade model to aggregate
$\Rightarrow$ sum up state results (+ weighting) ▸ Trade Model

Implications for Employment

Previous results ⇒ can use a standard trade model to aggregate ⇒ sum up state results (+ weighting) ▸ Trade Model

Drop in benefit duration in state s led to a percentage increase in E/P by the end of 2014 of

$$\mu_s = \tilde{\beta}_4 (b_s^{2014Q4} - b_s^{2013Q4}) EP_s^{2013}. \tag{2}$$

Aggregate employment increase by the end of 2014 due to the policy reform as

$$\pi^E = \sum_{\text{All U.S. states } s} (\mu_s P_s^{2014} - E_s^{2013Q4}). \tag{3}$$

where P_s and E_s are population and employment. Using the estimate of $\tilde{\beta}_4$ from our benchmark specification in this calculation implies

$$\pi^E = 2,542,625. \tag{4}$$

Implications for Labor Force

Drop in benefit duration in state s led to a percentage increase in L/P by the end of 2014 of

$$\mu_s = \tilde{\beta}_4 (b_s^{2014Q4} - b_s^{2013Q4}) LP_s^{2013}. \tag{5}$$

Aggregate labor force increase by the end of 2014 due to the policy reform as

$$\pi^L = \sum_{\text{All U.S. states } s} (\mu_s P_s^{2014} - L_s^{2013Q4}). \tag{6}$$

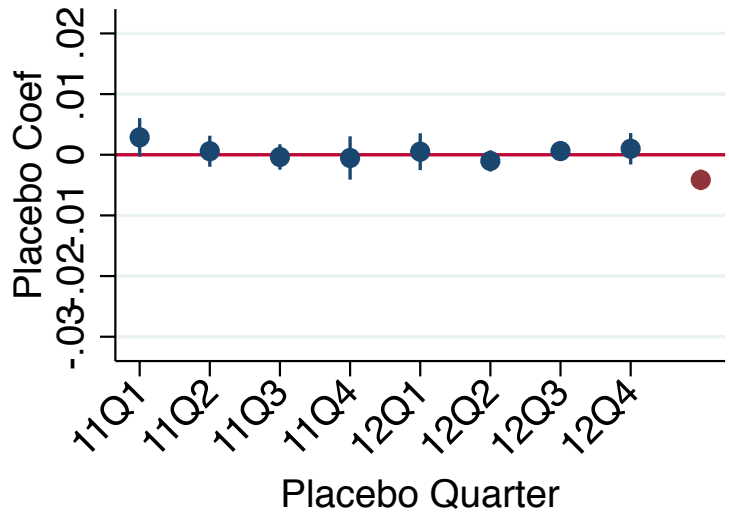
Using the estimate of $\tilde{\beta}_4$ from our benchmark specification in this calculation implies

$$\pi^L = 1,846,049. \tag{7}$$

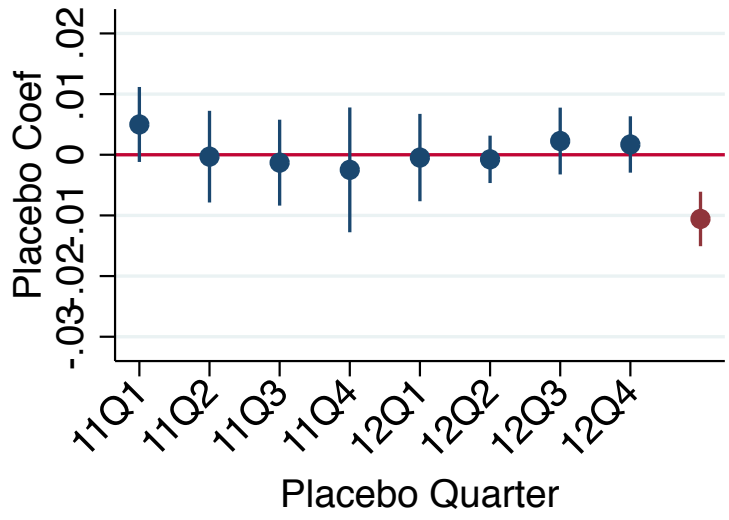
Interpretation

- The increase in employment much larger than the decrease in unemployment $(= 696,574 = 2,542,625 - 1,846,049)$.
- More than half of the increase in employment was due to the increase in the labor force.
- Main effect not unemployed dropping out of the labor force, but increased participation.
- Consistent with a rise in job creation in response to the cut in benefits. Suggest a large macro effect.

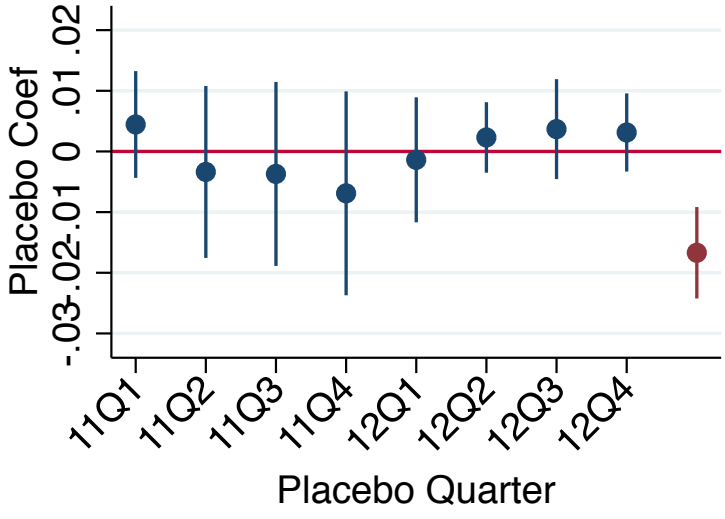
Placebo Analysis: E/P



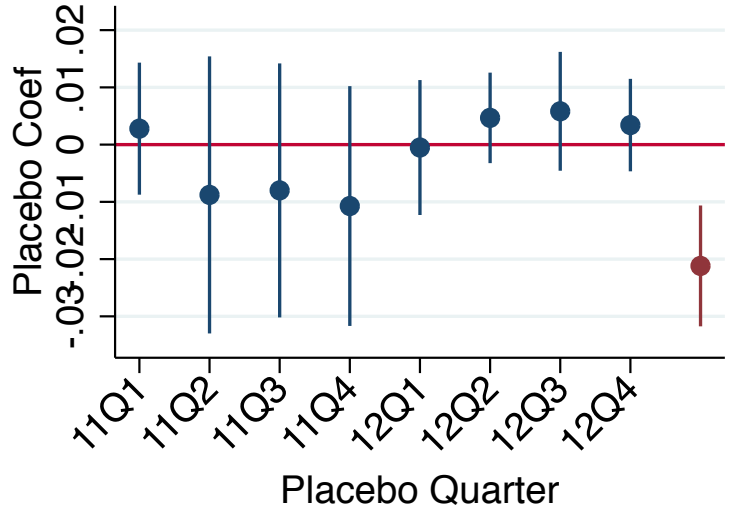
(a) $\tilde{\beta}_1$



(b) $\tilde{\beta}_2$

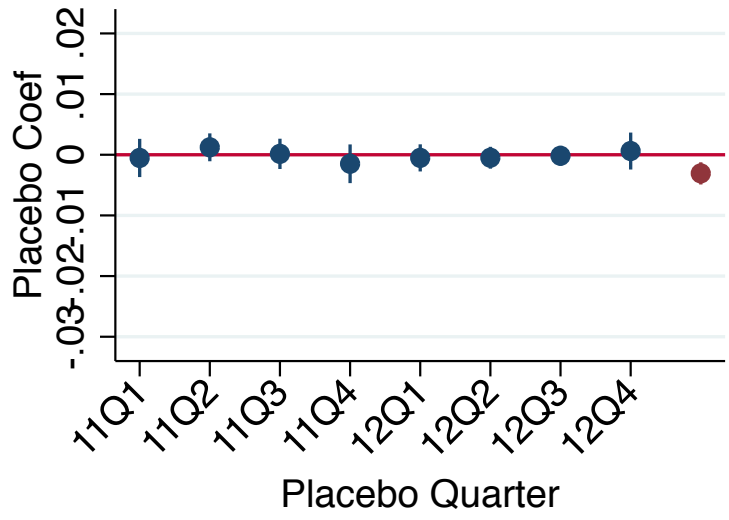


(c) $\tilde{\beta}_3$

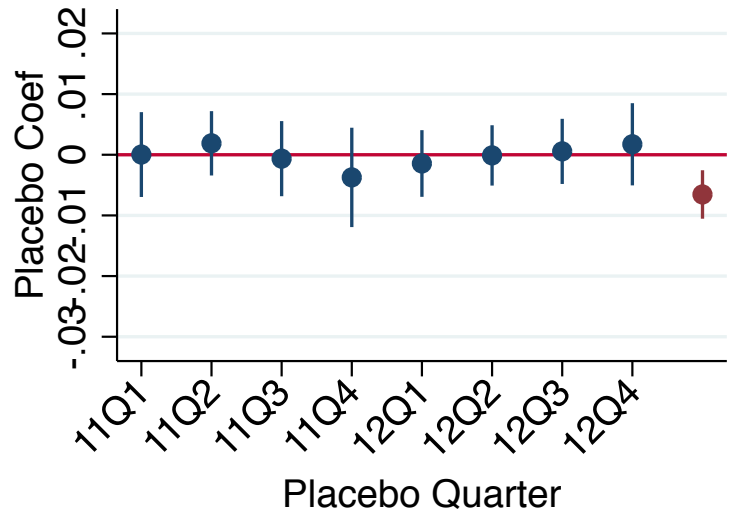


(d) $\tilde{\beta}_4$

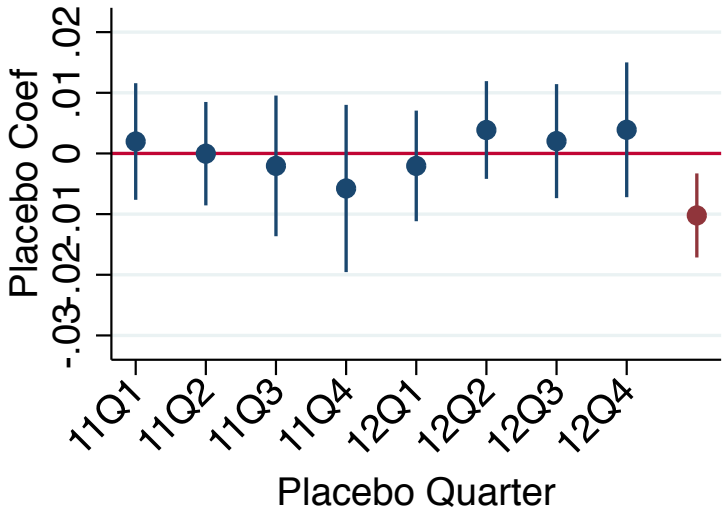
Placebo Analysis: L/P



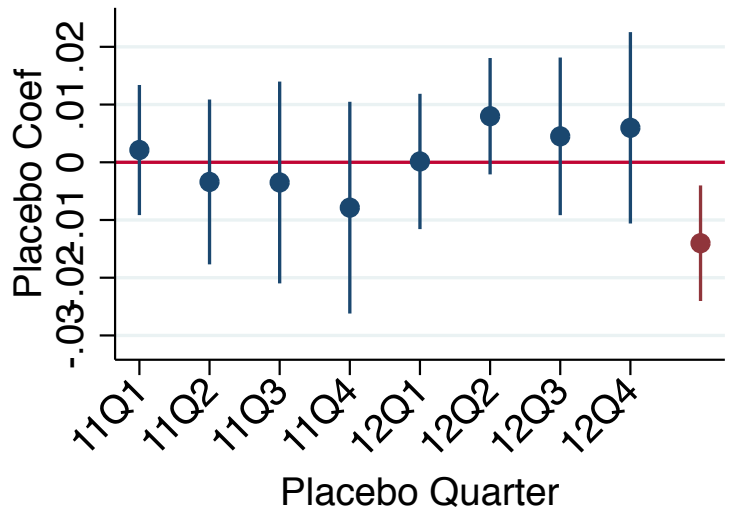
(a) $\tilde{\beta}_1$



(b) $\tilde{\beta}_2$

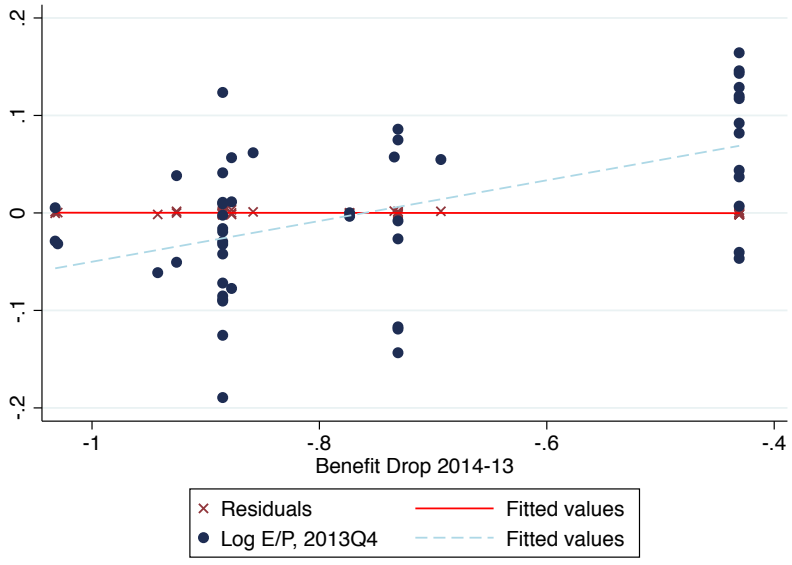


(c) $\tilde{\beta}_3$

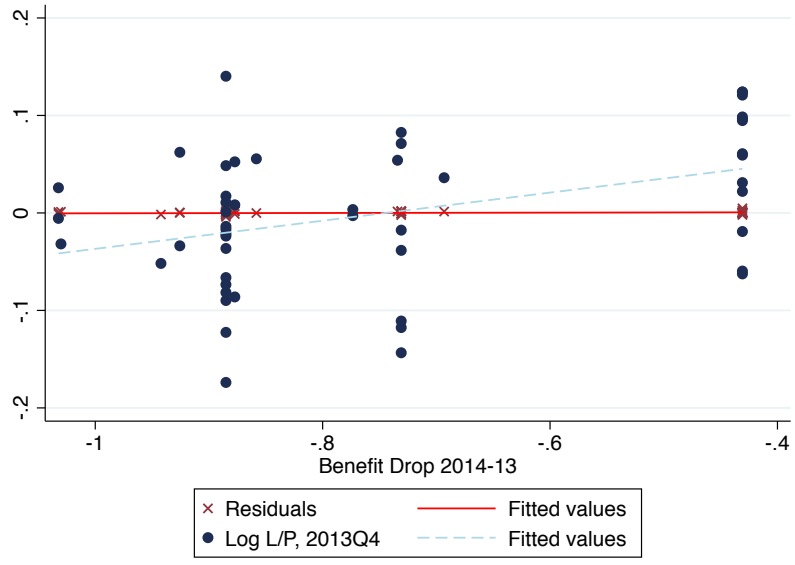


(d) $\tilde{\beta}_4$

Validity of Specification: Residuals



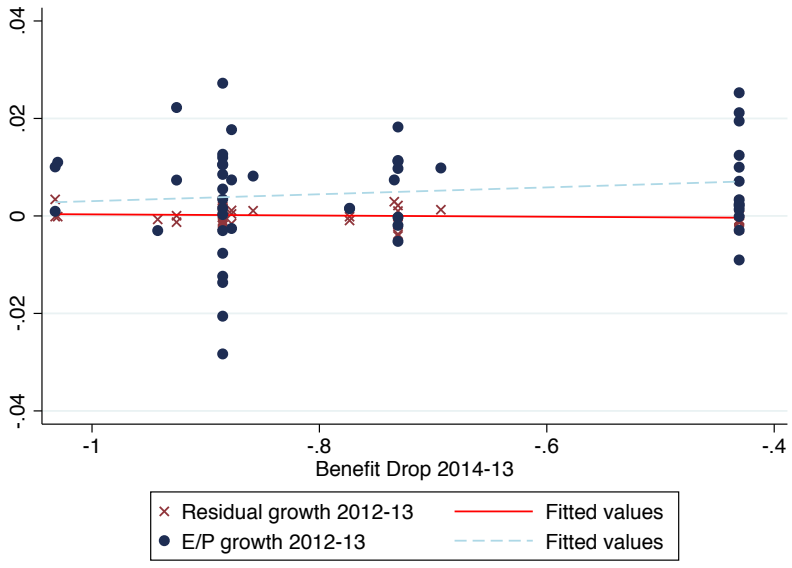
(a) Employment States



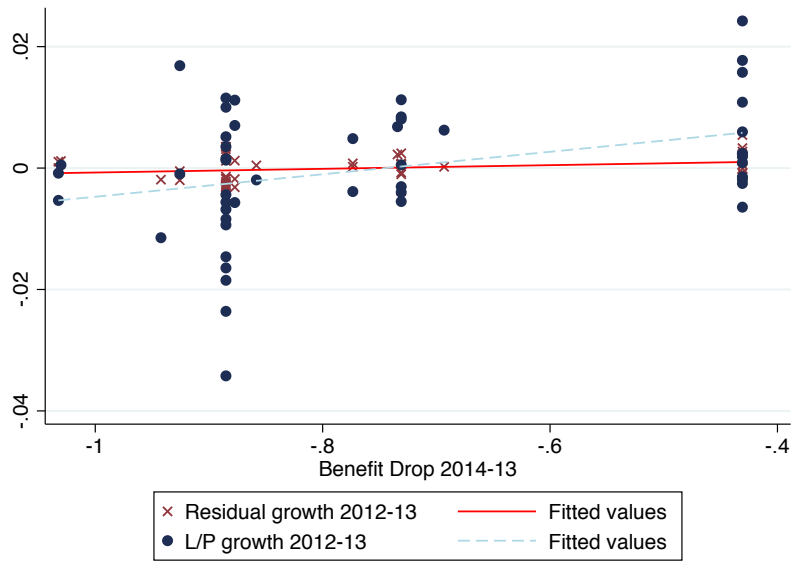
(b) LFP States

- Take residuals $\epsilon_{i,2013Q4}$
- Plot against change in benefits between 2014Q4-2013Q4
- Compare to level of E/P and L/P in 2013Q4

Validity of Specification: Residuals



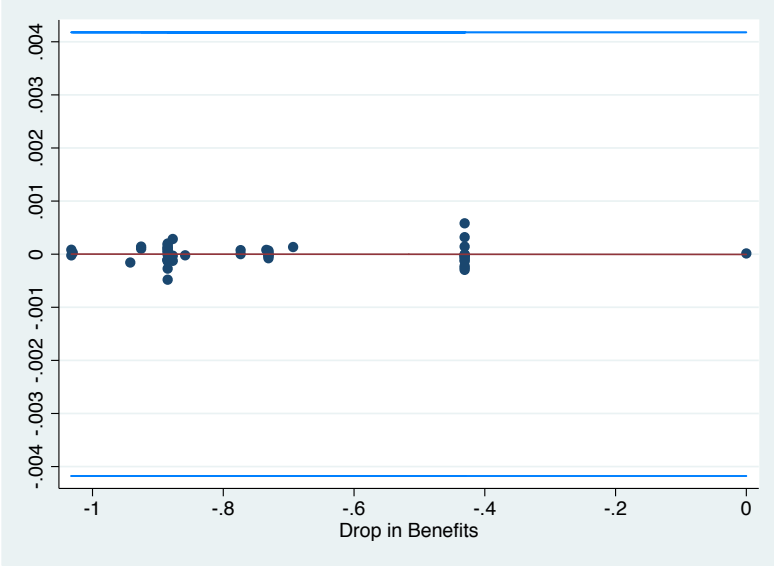
(a) Employment States



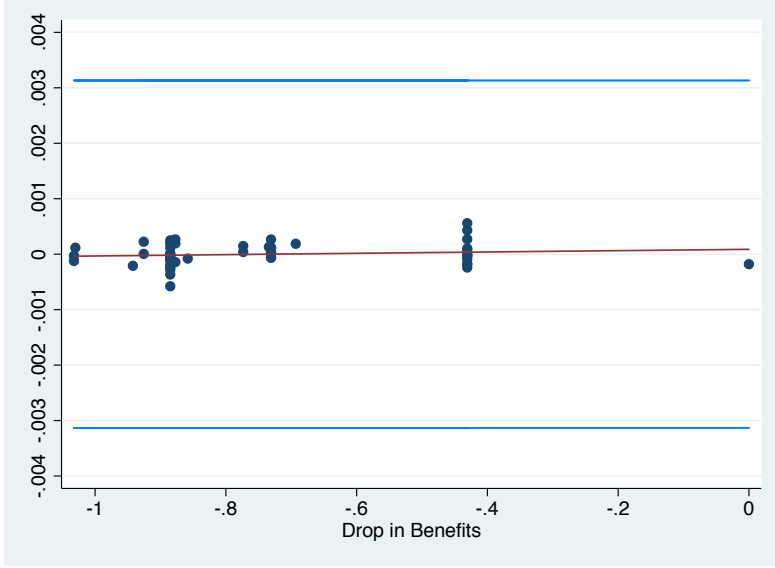
(b) LFP States

- Compute growth in residuals $\epsilon_{i,2013Q4} - \epsilon_{i,2012Q4}$
- Plot against change in benefits between 2014Q4-2013Q4
- Compare to growth in E/P and L/P in 2013

Validity of Specification: Residual Pre-trends



(a) Employment States



(b) LFP States

- Take residuals $\epsilon_{i,t}$
- Regress for each state over the 2011Q1-2013Q4 period on a constant and a linear time trend.
- Plot against change in benefits between 2014Q-2013Q4

Robustness

- Sensitivity to Lags
- Different State Trends
- Border States
- QCEW Analysis

Skip

Sensitivity to Number of Lags

	Employment to Population Ratio
VARIABLES	$\tilde{\beta}_4$
2 Lags	-0.0213***
	(0.00408)
Benchmark	-0.0214***
	(0.00545)
4 Lags	-0.0209***
	(0.00469)
5 Lags	-0.0207***
	(0.00508)
6 Lags	-0.0202***
	(0.00442)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Full Table

Sensitivity to Number of Lags

Labor Force to Population Ratio	
VARIABLES	$\tilde{\beta}_4$
2 Lags	-0.0160***
	(0.00497)
Benchmark	-0.0145***
	(0.00509)
4 Lags	-0.0149***
	(0.00530)
5 Lags	-0.0147***
	(0.00521)
6 Lags	-0.0143***
	(0.00506)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Full Table

Empirical Methodology: Alternate State Trends

- Traditional method of trends in the literature (e.g. min wages) imposes state-specific linear trends
- We replace the flexible model of state-specific trends in the benchmark specification with linear state-specific trends ζ_i:

$$\begin{aligned} x_{i,t} &= \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) \\ &+ \sum_{j=1}^{n} \gamma_j x_{i,t-j} + \zeta_i \times t + \eta_i + \delta_t + \epsilon_{i,t}. \end{aligned}$$

- We also consider a flexible trend that loads on 2006 level of E/P (instead of 2013Q4)

Results

Employment to Population Ratio

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Benchmark	-0.00418***	-0.0107***	-0.0169***	-0.0214***
	(0.000852)	(0.00228)	(0.00386)	(0.00545)
Linear Trend	-0.00338***	-0.00760***	-0.0125***	-0.0174***
	(0.000671)	(0.00168)	(0.00304)	(0.00471)
2006 control	-0.00412***	-0.0105***	-0.0166***	-0.0211***
	(0.000897)	(0.00231)	(0.00373)	(0.00504)
2013 & 2006	-0.00419***	-0.0107***	-0.0169***	-0.0215***
	(0.00103)	(0.00276)	(0.00496)	(0.00718)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results

Labor Force to Population Ratio

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Benchmark	-0.00313***	-0.00673***	-0.0105***	-0.0145***
	(0.000989)	(0.00212)	(0.00354)	(0.00509)
Linear Trend	-0.00266***	-0.00474***	-0.00704***	-0.0103***
	(0.000533)	(0.00142)	(0.00269)	(0.00399)
2006 control	-0.00305***	-0.00649***	-0.0101***	-0.0139***
	(0.000926)	(0.00203)	(0.00353)	(0.00508)
2013 & 2006	-0.00361**	-0.00802***	-0.0129***	-0.0176***
	(0.00146)	(0.00308)	(0.00466)	(0.00611)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Empirical Methodology II: Border States

- Prominent approach in empirical analysis of the effects of policies is to compare the states bordering each other but having different policies.
- Idea: many shocks, e.g., weather conditions, affect neighboring states similarly.
- Impact of such shocks must be modeled in the specification based on states
- With border design can be captured by a bordering state by time dummy:

$$\begin{aligned} x_{i,p,t} &= \sum_{\tau=1}^{4} \beta_\tau \mathbf{1}_{t=2014Q\tau}(b_{i,t} - b_{i,2013Q4}) \\ &+ \sum_{j=1}^{n} \gamma_j x_{i,p,t-j} + \nu_t \tilde{x}_{i,p,2013Q4} + \eta_{i,p,t} + \epsilon_{i,p,t}, \end{aligned}$$

where $\eta_{i,p,t}$ is the border-pair by time dummy.

Border State Results

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Emp/Pop Ratio	-0.00497***	-0.0111***	-0.0154***	-0.0177***
	(0.000909)	(0.00221)	(0.00314)	(0.00381)
LF/Pop Ratio	-0.00357***	-0.00720***	-0.00936***	-0.0112***
	(0.00101)	(0.00194)	(0.00259)	(0.00315)

Robust standard errors clustered by state, state pair, and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Robustness: QCEW Employment

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
States	-0.00236**	-0.00471**	-0.00811***	-0.0129***
	(0.000916)	(0.00192)	(0.00309)	(0.00410)
Border States	-0.00383***	-0.00628***	-0.00994***	-0.0133***
	(0.000684)	(0.00114)	(0.00169)	(0.00209)

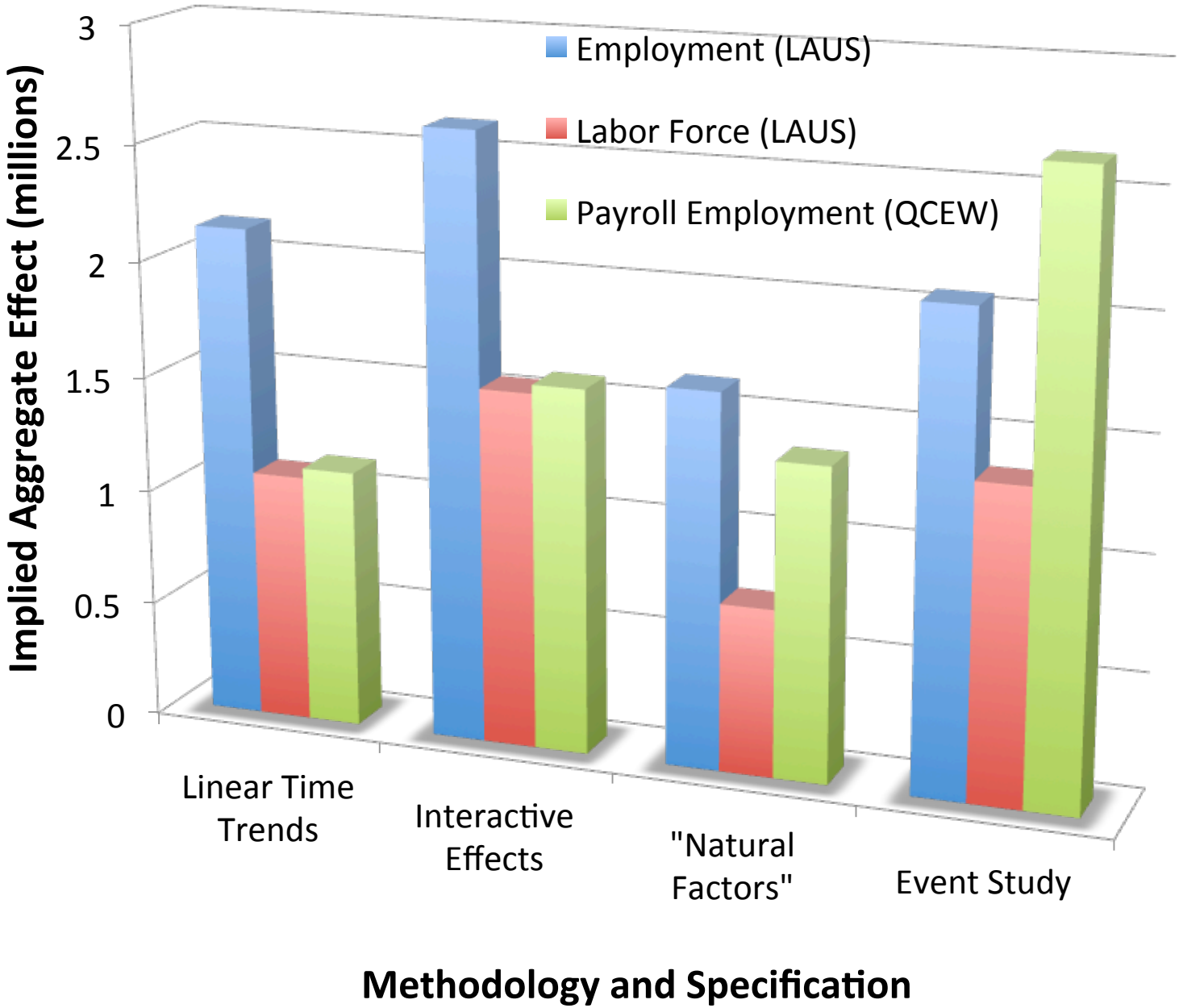
Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusion

- We measure the unemployment benefits on employment and labor force in response the 2014 "Natural Experiment."
- Unemployment benefit extensions lead to large declines in employment and labor force.

Next steps: what are the mechanisms underlying these effects?

Border county design



Aggregation

- Can build simple trade model of (closed) US economy
- Assume each state small open economy, produces tradable and non-tradable, LOOP holds for tradable
- Both sectors subject to MP-style search frictions, free entry of firms
- Based on previous results, assume workers only search in home state
- Show that our elasticity for the employment response at the state level can be used at the aggregate level as well.

Return

Sensitivity to Number of Lags

Employment to Population Ratio

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Benchmark	-0.00418***	-0.0107***	-0.0169***	-0.0214***
	(0.000852)	(0.00228)	(0.00386)	(0.00545)
2 Lags	-0.00442***	-0.0110***	-0.0171***	-0.0213***
	(0.000682)	(0.00164)	(0.00278)	(0.00408)
4 Lags	-0.00403***	-0.0105***	-0.0166***	-0.0209***
	(0.000818)	(0.00209)	(0.00341)	(0.00469)
5 Lags	-0.00398***	-0.0104***	-0.0164***	-0.0207***
	(0.000805)	(0.00214)	(0.00360)	(0.00508)
6 Lags	-0.00382***	-0.0101***	-0.0160***	-0.0202***
	(0.000835)	(0.00203)	(0.00324)	(0.00442)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Return

Sensitivity to Number of Lags

Labor Force to Population Ratio

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Benchmark	-0.00313***	-0.00673***	-0.0105***	-0.0145***
	(0.000989)	(0.00212)	(0.00354)	(0.00509)
2 Lags	-0.00333***	-0.00739***	-0.0117***	-0.0160***
	(0.000714)	(0.00177)	(0.00339)	(0.00497)
4 Lags	-0.00308***	-0.00672***	-0.0108***	-0.0149***
	(0.000907)	(0.00198)	(0.00355)	(0.00530)
5 Lags	-0.00307***	-0.00671***	-0.0107***	-0.0147***
	(0.000921)	(0.00198)	(0.00349)	(0.00521)
6 Lags	-0.00296***	-0.00648***	-0.0104***	-0.0143***
	(0.000928)	(0.00207)	(0.00352)	(0.00506)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Return

Results

Employment to Population Ratio

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Benchmark	-0.00418***	-0.0107***	-0.0169***	-0.0214***
	(0.000852)	(0.00228)	(0.00386)	(0.00545)
Linear Trend	-0.00338***	-0.00760***	-0.0125***	-0.0174***
	(0.000671)	(0.00168)	(0.00304)	(0.00471)
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	(0.000897)	(0.00231)	(0.00373)	(0.00504)
2013 & 2006	-0.00419***	-0.0107***	-0.0169***	-0.0215***
	(0.00103)	(0.00276)	(0.00496)	(0.00718)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Return

Results

Labor Force to Population Ratio

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Benchmark	-0.00313***	-0.00673***	-0.0105***	-0.0145***
	(0.000989)	(0.00212)	(0.00354)	(0.00509)
Linear Trend	-0.00266***	-0.00474***	-0.00704***	-0.0103***
	(0.000533)	(0.00142)	(0.00269)	(0.00399)
2006 control	-0.00305***	-0.00649***	-0.0101***	-0.0139***
	(0.000926)	(0.00203)	(0.00353)	(0.00508)
2013 & 2006	-0.00361**	-0.00802***	-0.0129***	-0.0176***
	(0.00146)	(0.00308)	(0.00466)	(0.00611)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Return

Border State Results

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
Emp/Pop Ratio	-0.00497***	-0.0111***	-0.0154***	-0.0177***
	(0.000909)	(0.00221)	(0.00314)	(0.00381)
LF/Pop Ratio	-0.00357***	-0.00720***	-0.00936***	-0.0112***
	(0.00101)	(0.00194)	(0.00259)	(0.00315)

Robust standard errors clustered by state, state pair, and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Return

Robustness: QCEW Employment

VARIABLES	$\tilde{\beta}_1$	$\tilde{\beta}_2$	$\tilde{\beta}_3$	$\tilde{\beta}_4$
States	-0.00236**	-0.00471**	-0.00811***	-0.0129***
	(0.000916)	(0.00192)	(0.00309)	(0.00410)
Border States	-0.00383***	-0.00628***	-0.00994***	-0.0133***
	(0.000684)	(0.00114)	(0.00169)	(0.00209)
Border Counties	0.00622***	-0.00817**	-0.0189***	-0.0212***
	(0.00176)	(0.00359)	(0.00586)	(0.00792)

Robust standard errors clustered by state and time in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Return

Unemployment Benefits and Unemployment in the Great Recession: The Role of Micro Effects

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Iourii Manovskii[2]

Kurt Mitman[3]

[1]University of Oslo

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Introduction

Disclaimer: This paper is very preliminary work in progress.

- Objective: assess the contribution of the *micro effect* following the unprecedented extension of unemployment benefits during the Great Recession.
- Approach (related to Rothstein, Farber, Valletta):
  - Use data from matched monthly Current Population Survey.
  - Identify those eligible and ineligible for benefits.
  - Search effort of eligible $s_{it}^E(b_t)$ depends on available benefits.
  - Search effort of ineligible s_{it}^I is independent of benefits.
  - UE-transition$_{it} \equiv \pi_{it} = \underbrace{s}_{\text{search intensity}} \times \underbrace{f(\theta)}_{\text{finding rate per unit of } s}$
  - Thus,

$$\frac{\pi_{it}^E}{\pi_{it}^I} = \frac{s_{it}^E(b_t)}{s_{it}^I}.$$

Empirical Approach

- $P(Y=1) = \alpha_0 I^e_{i,t} + \alpha_1 \log(b_t) I^e_{i,t} + \delta_{t,s} + \theta X_{i,t}$, where
  - $Y = 1$ if the person does and $Y = 0$ if the person does not exit to employment,
  - $\delta_{t,s}$ is a state$\times$time dummy,
  - $I^e = 1$ if the unemployed is eligible for benefits and $I^e = 0$ otherwise.
  - X_i includes observable characteristics of individual i.
- The parameter α_1, which measures micro elasticity is identified because sample includes eligible and ineligible.
- In particular, $\delta_{t,s}$ picks up the macro effect but not the micro effect since benefits are interacted with the eligibility indicator I^e.

Results: Total U Outflow

- $P(Y = 1) = \alpha_0 I^e_{i,t} + \alpha_1 \log(b_t) I^e_{i,t} + \delta_{t,s} + \theta X_{i,t}$, where $Y = 1$ for exit to employment or to out-of-labor force.
- $\hat{\alpha}_1 = -0.032$, or the micro elasticity of $0.1 = 0.032/0.32$ (using the av. exit rate in our sample of 0.32).
- The elasticity of 0.1 implies that benefit duration increase from 26 to 99 weeks leads to a log change in the exit rate of

$$0.1 * (\log(99) - \log(26)) = 0.134.$$

- Using again an exit rate of 0.32, this implies that the exit rate falls to 0.28 ($exp(\log(0.32) - 0.134) = 0.280$).
- In terms of weeks, 0.32 corresponds to 14 weeks and 0.28 to about 16 weeks, i.e. an increase by 2 weeks.
- So a $73 = 99 - 26$ week increase raises duration by about 2 weeks, or a 0.3 weeks increase in unemp. duration for a 10 week extension.

Results: UE Outflow - Short-term

- $P(Y = 1) = \alpha_0 I^e_{i,t} + \alpha_1 \log(b_t) I^e_{i,t} + \delta_{t,s} + \theta X_{i,t}$,
  $Y = 1$ for exit to E only; sample of unemp. for < 26 weeks.

- $\hat{\alpha}_1 = -0.006$, or the micro elasticity of $0.026 = 0.006/0.23$ (using the av. UE rate in this sample of 0.23).

- The elasticity of 0.026 implies that benefit duration increase from 26 to 99 weeks leads to a log change in the exit rate of

$$0.026 * (\log(99) - \log(26)) = 0.0348.$$

- Using again an exit rate of 0.23, this implies that the exit rate falls to 0.222 ($\exp(\log(0.23) - 0.0348) = 0.222$).

- In terms of weeks, 0.23 corresponds to 19.6 weeks and 0.222 to 20.3 weeks, i.e. an increase by 0.7 weeks.

- So a $73 = 99 - 26$ week increase raises duration by about 0.7 weeks, or a 0.1 week increase in unemp. duration for a 10 week extension.

Controlling for Selection

- One concern is the selection into eligibility status that may change with benefit durations.
- Exploit panel structure of the CPS.
  - Consider those unemployed in month t and $t+1$ but potentially transiting across labor market states in period $t+2$.
  - Difference all the variables between t and $t+1$:

$$\Delta P(Y=1) = \alpha_1 \, \Delta \log(b_t) \, I^e_{i,t} + \Delta \delta_{t,s} + \theta \Delta X_{i,t},$$

Results

	1979-1985	2006-2012
$Y \equiv UE$	-.0081	.0027
	[-.0220 , .0059]	[-.0187 , .0241]
$Y \equiv UN$	-.0046	.0032
	[-.0186 , .0095]	[-.0097 , .0160]

Note - 95% confidence interval in brackets.

Interpretation: Consider $\hat{\alpha}_1 = -0.01$, av. exit rate of 0.3 and duration increase from 26 weeks to 99. The exit rate falls to

$$0.3 - 0.01 * (log(99) - log(26)) = 0.2866.$$

0.3 corresponds to $14.3 = (4.3/.3)$ weeks and 0.2866 to 15 weeks, an increase by .7 weeks. So for an increase by $73 = 99 - 26$ weeks, duration increases by .7, or **a 0.1 weeks** increase so for every 10 week extension.

Unemployment Benefits and Unemployment in the Great Recession: The Role of Macro Effects

Marcus Hagedorn[1]

Fatih Karahan[2]

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Introduction

- UI benefit extension is one of the most prominent and actively used countercyclical stabilization policies.
- Policy evaluation depends on its impact on the aggregate labor market variables, e.g (un)employment, labor force, job vacancies.
- Problem: Until very recently empirical literature has not tried to assess the total effects of this policy.

Objective: Make progress on addressing this problem.

Two Main Challenges to Empirical Work

Challenge 1: Expectations.

- As all investment decisions, firms' job creation decisions depend on expectations of future policies (like UI benefit generosity) as well as future productivity and demand.
- Channel largely ignored in the UI literature.

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Challenge 2: Endogeneity

- UI benefit duration responds to past changes in unemployment rate at the state level.

The Importance of Expectations: An Example

Experiment 1: States A and B start with identical UI policies.

State A: Extends benefits by 20 weeks for one year.

State B: Extends benefits by 10 weeks permanently.

- Our findings:
  - State A: Unemployment $\uparrow$ 0.5 percentage points.
  - State B: Unemployment $\uparrow$ 0.8 percentage points.

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- Naive difference-in-differences:
  - Significant *negative* impact of benefits on unemployment.

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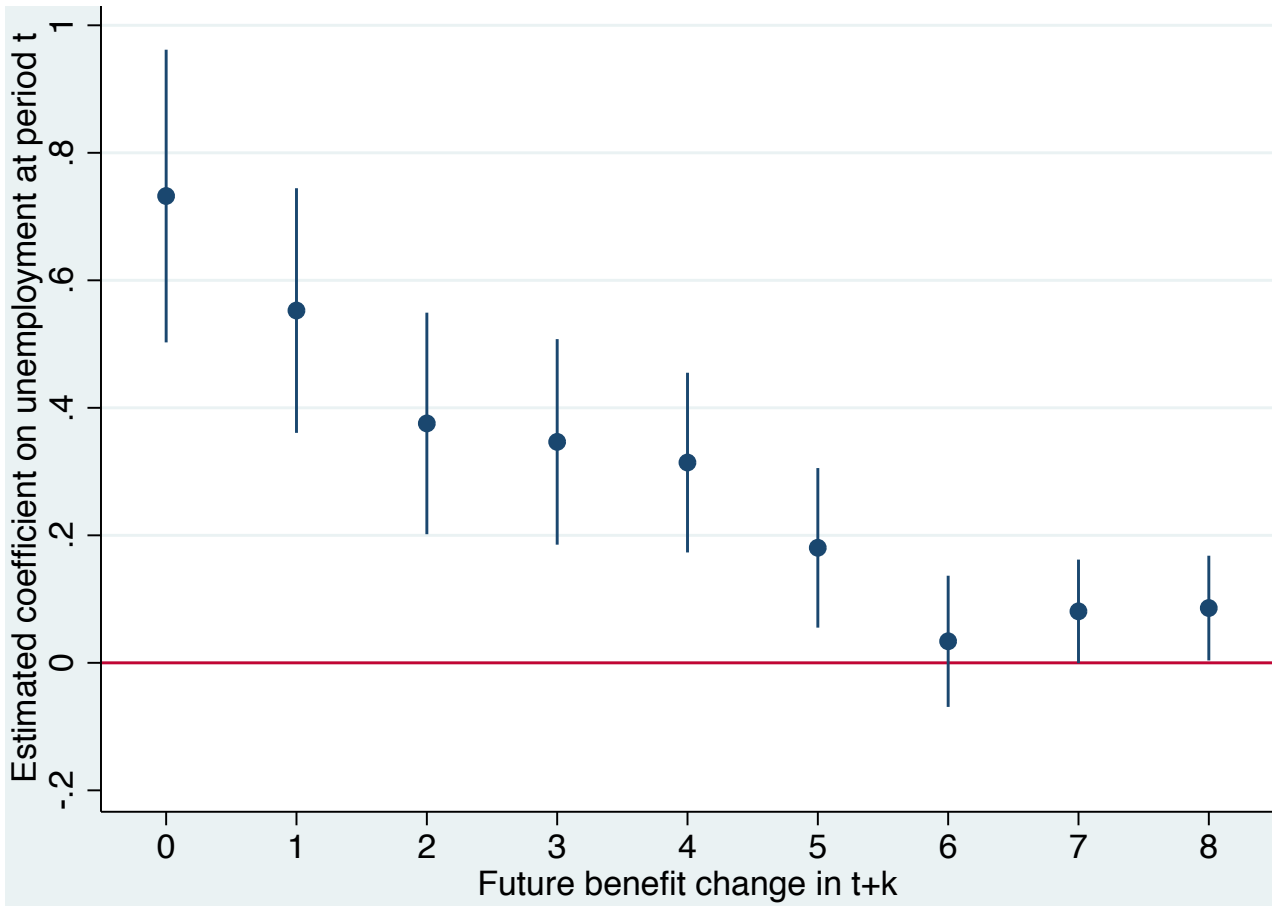
- Naive difference-in-differences:
  - Significant *negative* impact of benefits on unemployment.

Experiment 2: Extensions in Exp. 1 announced in advance.

- Theory: The adjustment of job creation occurs prior to the actual change in policy.
- Naive difference-in-differences:
  - *No* impact of benefits on unemployment.

Expectations in State Data

- Regress quarter t state unemployment on benefit duration in t and changes in benefits duration over the next 8 quarters (+ state and time FEs).

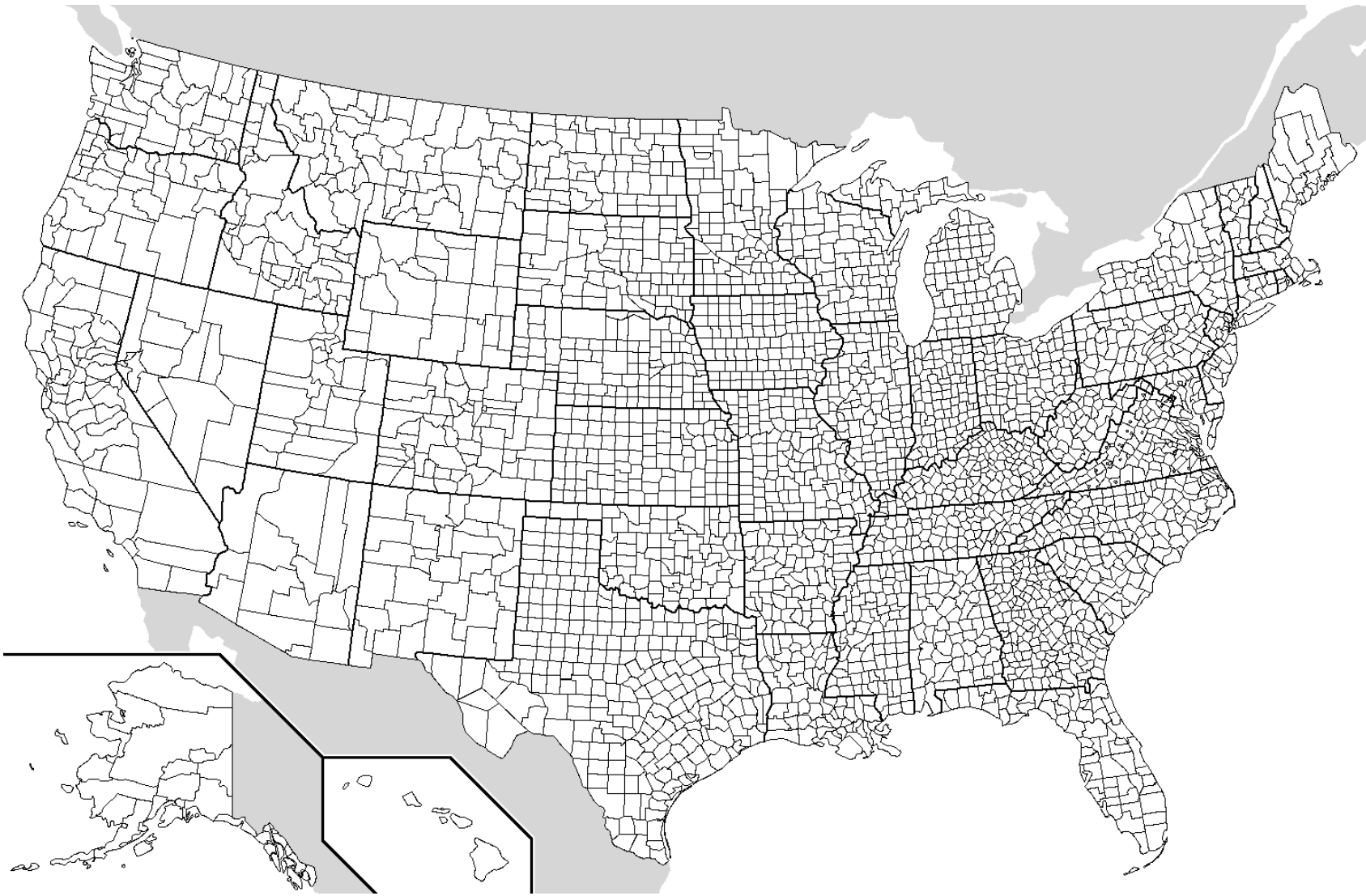


- Does not isolate expectation effects: endogeneity of benefits.

Measurement Strategy

- Employ the dominant methodology in the labor literature (Holmes, Card and Krueger, Dube et. al.): exploit a policy discontinuity at state borders.
  - Compare the evolution of unemployment in counties that border each other but belong to different states.
  - Economic shocks propagate smoothly across state borders.
  - Key feature that separates border counties is difference in policies.
- We will provide formal evidence for this.
  - Differences in state level productivities and demand (Bartik methodology) do not predict border county differences in unemployment.
- Control for other state policies to isolate the effect of benefit extensions.

Counties in the US



Key Aspects of Border-County Methodology

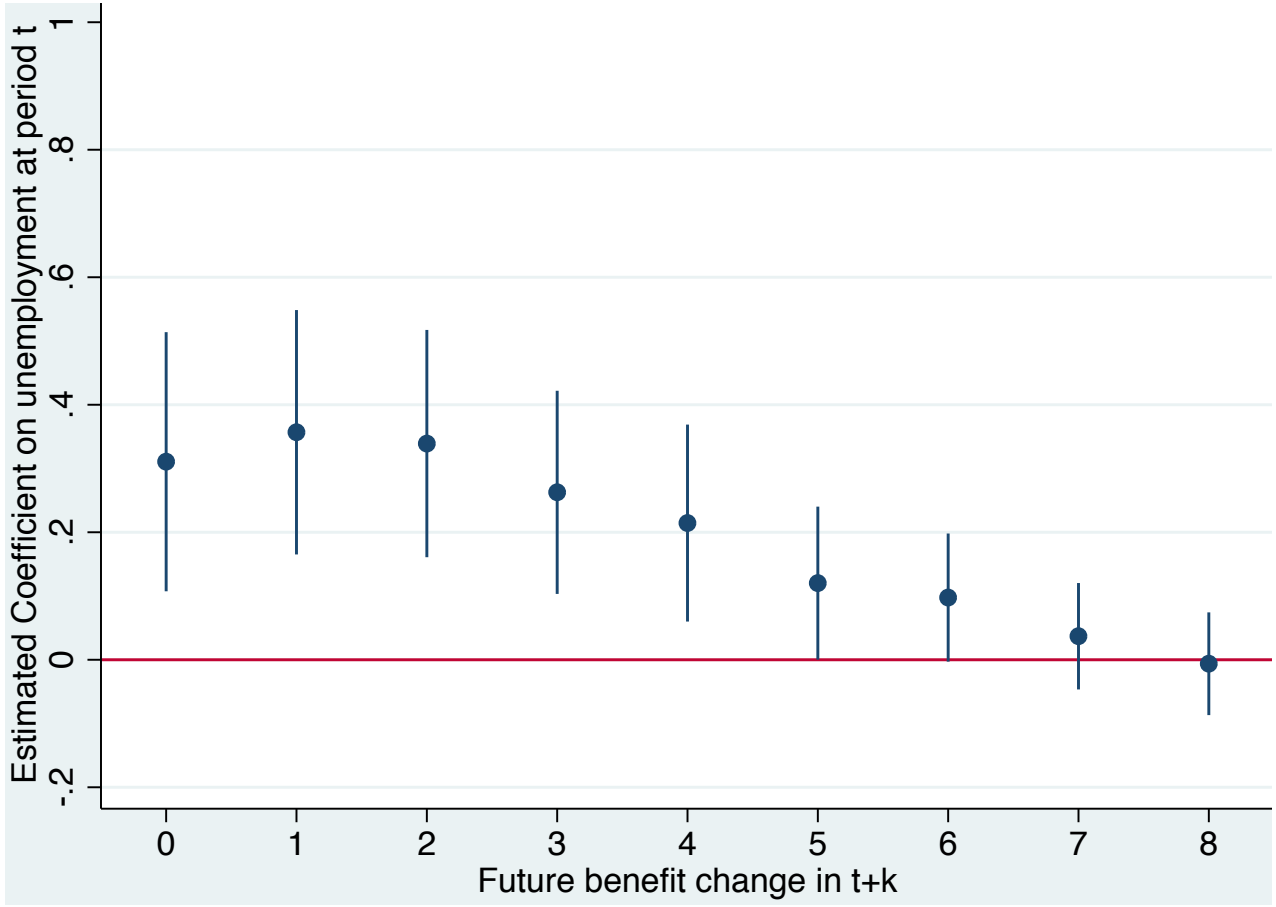
- **Identifying Assumption**: Discontinuity!
  - Fundamental Shocks evolve smoothly (sun, rain,...). (We validate this.)
  - Policy is discontinuous. (Fact: Set at the state-level)
- **Interpretation**: Requires additional results
  - Cross-border mobility of firms and workers would matter.
    - Firms: Benefit duration depends on the location of job. No differential incentive to hire cross-border.
    - Firms: Same magnitude effect on both tradeable and non-tradable sector (retail, food services). Cross-border reallocation negligible.
    - Workers: Negligible response of cross-border mobility to benefit extension in ACS and LAUS data.
    - Consumers: Hagedorn, Handbury, Manovskii (2015): Negligible response of cross-border shopping to benefit extension in Nielsen Consumer Panel Data.
    - More Evidence below.

Unemployment Benefit Duration across US States, 2008-2012

(Unemployment Benefit Duration Map)

Expectations in Border County Data

- Similar regression but variables differenced between border counties (+ border county pair FEs).



- Isolates effects of expectations because endogeneity problem is eliminated.

How to Control for Expectations?

One Alternative: Do nothing.

- Problem: have shown expectation effects important.
- Generates uninterpretable results.

Our Approach: Semi-Structural.

- Use some elements of the model to control for expectations.
- Here: Use dynamic job creations decisions in the data.
- Job creation decision depends on current fundamentals (current productivity, demand, benefits) and expectations of future fundamentals (productivity, demand, benefits).
- The model allows us to separate them.

Empirical Specification

- Value of a filled job is (β discount factor, s separation rate):

$$J_t = \pi_t + \beta(1 - s_t)E_t J_{t+1},$$

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where θ is observable ratio of vacancies to unemployment.

- Expanding around the steady state and using free entry:

$$\log(\theta_t) - \beta(1 - s_t)\log(\theta_{t+1}) = \kappa(1 - \beta(1 - s))\log(\pi_t) + \log(\epsilon_t).$$

▸ Details

Empirical Specification

- In quarterly data for variables like unemployment it holds that (e.g. Hall (2005), Shimer (2005)):

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- Differencing between border counties i and j in pair p:

$$\Delta\tilde{x}_{p,t} = \alpha\Delta b_{p,t} + \Delta\epsilon_{p,t},$$

where $\Delta\tilde{x}_{p,t} = \tilde{x}_{p,i,t} - \tilde{x}_{p,j,t}$, etc.

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  where $\Delta\tilde{x}_{p,t} = \tilde{x}_{p,i,t} - \tilde{x}_{p,j,t}$, etc.
- Use Interactive Effects estimator (+ IC criterion) to accommodate heterogeneous impact of aggregate shocks:

$$\Delta\epsilon_{p,t} = \lambda_p' F_t + \nu_{p,t}.$$

Interactive Effects

Various shocks may have affected the economy during the Great Recession.

- Same aggregate shocks could have heterogeneous effects on counties.
- Thus, aggregate shocks induce heterogeneous trends at the county level.
- Interactive effects estimator can consistently deal with this issue (Bai, 2009).

Factor Model

- We can decompose the error term as:

$$\Delta\epsilon_{p,t} = \lambda_p' F_t + \nu_{p,t}$$

  - λ_p $(r \times 1)$ is a vector of factor loadings
  - F_t $(r \times 1)$ is a vector of common factors

- Factor model specification:

$$\Delta e_{p,t} = \alpha \mathcal{I}_{t \geq 2013/Q4} \Delta b_{p,t} + \lambda_p' F_t + \nu_{p,t}$$

- Use Information Criterion approach to select the optimal number of factors (Bai and Ng, 2002).

Interactive Effects Model

Nesting of Additive Effects

- Consider the following *very special* case with 2 factors:

$$F_t = \begin{bmatrix} 1 \\ \xi_t \end{bmatrix} \qquad \lambda_p = \begin{bmatrix} \psi_p \\ 1 \end{bmatrix}$$

- This would yield a factor model of:

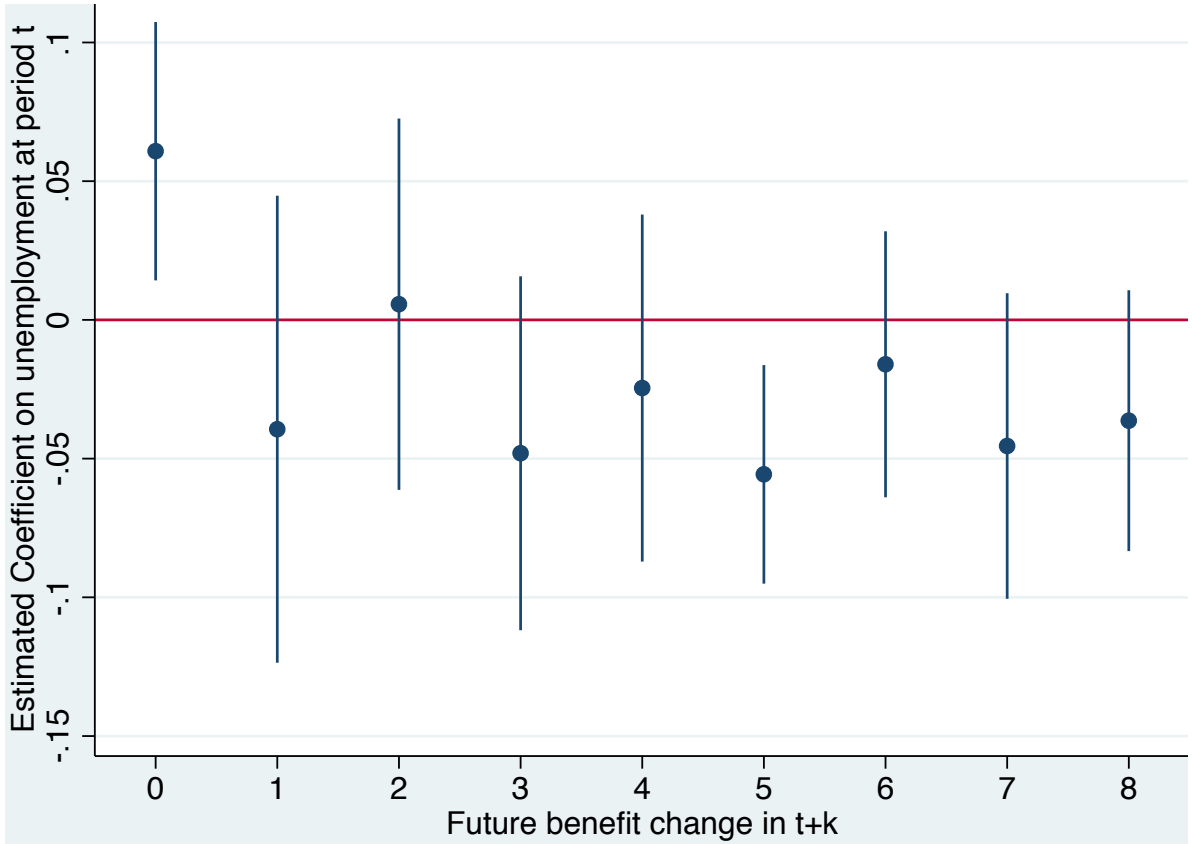
$$\begin{aligned} \Delta e_{p,t} &= \alpha \mathcal{I}_{t \geq 2013/Q4} \Delta b_{p,t} + \lambda_p' F_t + \nu_{p,t} \\ &= \alpha \mathcal{I}_{t \geq 2013/Q4} \Delta b_{p,t} + \psi_p + \xi_t + \nu_{p,t}. \end{aligned}$$

  or a model with a fixed effect and a time effect.

- Much richer county-pair trends can also be estimated, especially with more factors.

Eliminate Effects of Expectations

- Same border-county based regression with the difference in quasi-differenced unemployment on the lhs.



- Quasi-differencing eliminates the effect of expectations.
- Flip-side: Past quasi-differenced unemployment does not predict current benefits. No pre-trend.

Results

Baseline Results

VARIABLES	Unemployment	Unemployment
Weeks of Benefits	0.049	0.042
	(0.000)	(0.000)
Method	Factor Model	County & Time FE
Observations	37,177	37,177
R-squared	0.458	0.458

Bootstrap p-values in parentheses

Interpreting the Coefficients

- Obtain aggregation for policy experiment if each county responds like closed economy.
- Appears good approximation based on results on cross-border hiring, cross-border reallocation, cross-border shopping, cross-border mobility, within county demand effects.
- To fully account for demand effects need more structure: see Mitman & Rabinovich (2016)
- Permanent increase in benefits from 26 to 99 weeks: unemployment increases from 5% to 9.13%.
- Perfect foresight of future benefits: unemployment in 2011 would have been 2 percentage points lower without extensions.

Evidence on Interpretation I: Counties with population centers that are at most 30 miles apart

VARIABLES	Baseline	$<$ 30 miles sample
Weeks of	0.049	0.047
Benefits	(0.000)	(0.000)
Number of Factors	2	2
Observations	37,177	16,966
R-squared	0.458	0.419

Bootstrap p-values in parentheses

Evidence on Interpretation II: Border Counties from Same Core Based Statistical Areas

VARIABLES	Baseline	CBSA Sample
Weeks of	0.049	0.048
Benefits	(0.000)	(0.000)
Number of Factors	2	2
Observations	37,177	26,204
R-squared	0.458	0.465

Bootstrap p-values in parentheses

Assessing Challenge 1: Expectations

Validation of Methodology

Our Approach: Semi-Structural. Use the model and dynamic decisions in the data to infer expectations in the data. New methodology requires validation.

Validation Experiment: Conduct a Monte Carlo study to evaluate the performance of our measurement approach.

Findings: Methodology recovers the effect of an extension of unemployment benefits on unemployment very well.

Expectations: Direct Evidence

1-period ahead quasi-difference:

$$\tilde{x}_t^1 := \log(x_t) - \beta(1 - s_t)\log(x_{t+1}).$$

$$\Delta\tilde{x}_{p,t}^1 = \alpha_1 \Delta b_{p,t} + \lambda_p' F_t + \nu_{p,t}.$$

k (1)	Permanent Effect (2)	Implied Unemployment Rate (3)
1	0.60	**9.13 (Benchmark)**

Expectations: Direct Evidence

2-period ahead quasi-difference:

$$\tilde{x}_t^2 := \log(x_t) - \beta^2(1 - s_t)(1 - s_{t+1}) \log(x_{t+2}).$$

$$\Delta\tilde{x}_{p,t}^2 = \alpha_1 \Delta b_{p,t} + \alpha_2 \Delta b_{p,t+1} + \lambda_p' F_t + \nu_{p,t}.$$

k (1)	Permanent Effect (2)	Implied Unemployment Rate (3)
1	0.60	**9.13 (Benchmark)**
2	0.68	9.82

Expectations: Direct Evidence

3-period ahead quasi-difference:

$$\tilde{x}_t^3 := \log(x_t) - \beta^3(1-s_t)(1-s_{t+1})(1-s_{t+2})\log(x_{t+3}).$$

$$\Delta\tilde{x}_{p,t}^3 = \alpha_1\Delta b_{p,t} + \alpha_2\Delta b_{p,t+1} + \alpha_3\Delta b_{p,t+2} + \lambda_p' F_t + \nu_{p,t}.$$

k (1)	Permanent Effect (2)	Implied Unemployment Rate (3)
1	0.60	**9.13 (Benchmark)**
2	0.68	9.82
3	0.72	10.32

Expectations: Direct Evidence

k-period ahead quasi-difference:

$$\tilde{x}_t^k := \log(x_t) - (\prod_{m=1}^{k} \beta(1 - s_{t+m-1}))\log(x_{t+k}).$$

$$\Delta\tilde{x}_{p,t}^k = \sum_{m=1}^{k} \alpha_m \Delta b_{p,t+m-1} + \lambda_p' F_t + \nu_{p,t}.$$

k (1)	Permanent Effect (2)	Implied Unemployment Rate (3)
1	0.60	**9.13 (Benchmark)**
2	0.68	9.82
3	0.72	10.32
4	0.72	10.27
5	0.62	9.28
6	0.89	12.12
7	0.78	10.91
8	0.48	8.06
Mean	0.69	9.93

A Placebo Test

- Data from 1996-2000. No benefit extensions.
- Placebo trigger threshold at 5% construct benefits.
- Extension 13 weeks.
- Run benchmark regression

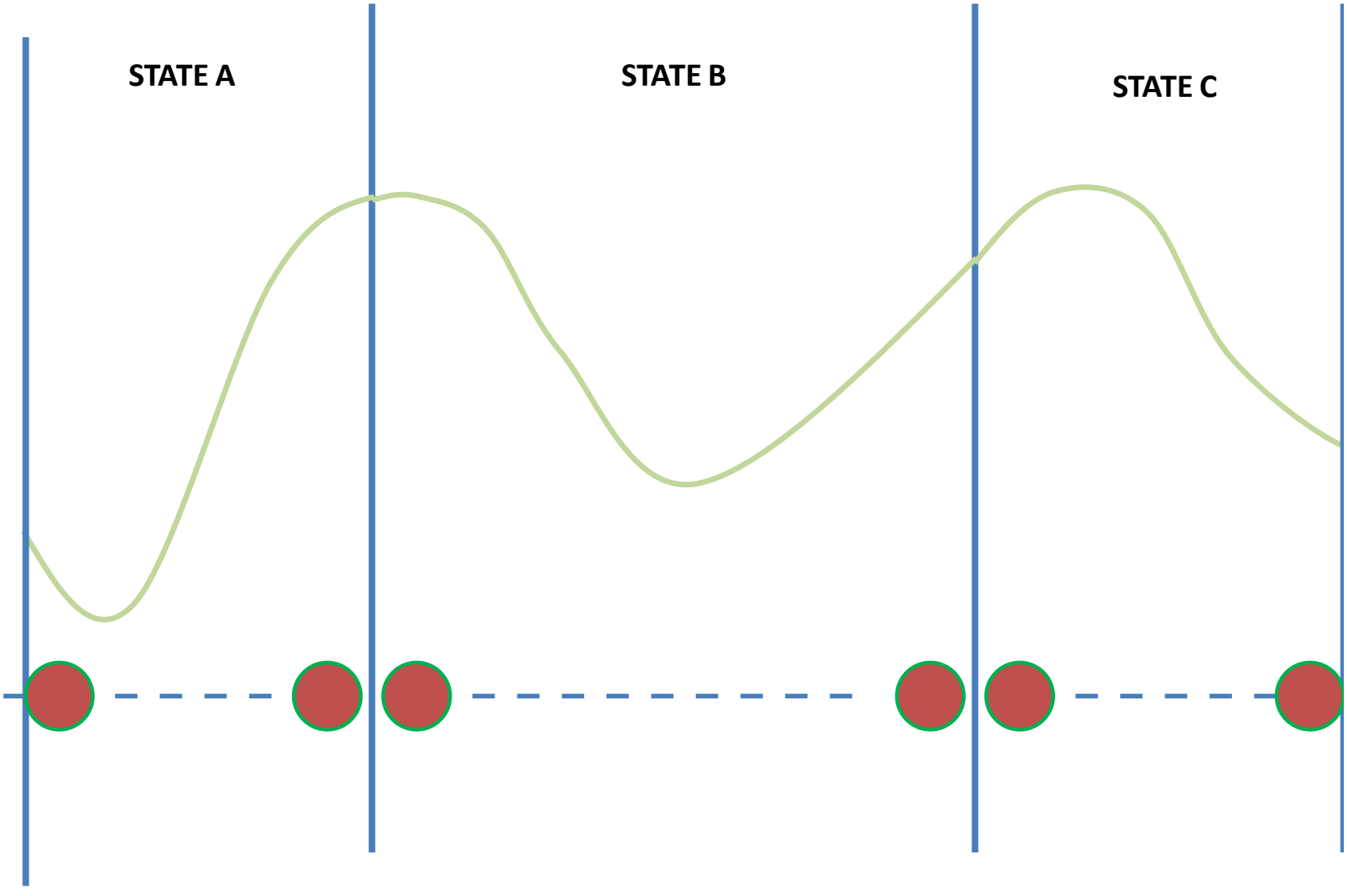
VARIABLES	Unemployment
Weeks of Benefits	0.007
	(0.17)
Bootstrap p-values in parentheses	

Assessing Challenge 2: Endogeneity

Praise of Dube et al (2010) Methodology

- *"This is one of the best and most convincing minimum wage papers in recent years."* – Lawrence Katz, Professor of Economics at Harvard; Editor, Quarterly Journal of Economics.
- *"The paper presents a fairly irrefutable case that state minimum wage laws do raise earnings in low wage jobs but do not reduce employment to any meaningful degree."*–David Autor, Professor of Economics at MIT; Editor, Journal of Economic Perspectives
- *"This paper boldly steps into the hornet's nest of a literature on the employment effects of minimum wage laws. Since the seminal Card and Krueger paper in the 1994 American Economic Review, this literature has been a mess of conflicting findings. As a result the economics profession has been unable to provide a clear message on this vital question of public policy. The bottom line is that the paper has "fixed" this literature and affirmed Card and Krueger's original finding that minimum wage laws do not appear to have adverse employment effects."* –Michael Greenstone, Professor of Economics at MIT; Director of the Hamilton Project at the Brookings Institution.

Continuous Fundamentals, Discontinuous Policy



Key Identifying Assumption

Empirical Specification:

$$\Delta \tilde{x}_{p,t} = \alpha \Delta b_{p,t} + \lambda_p' F_t + \nu_{p,t}$$

- Identifying assumption is that $\nu_{p,t}$ is uncorrelated with $\Delta b_{p,t}$
- $\nu_{p,t}$ contains unobserved *county-specific* factors such as demand and productivity
- Benefits are a function of *state-level* factors, e.g. productivity z_p, which requires:

$$Corr(\nu_{p,t}, \Delta z_p) = 0$$

- Our assumption does not require counties to be identical, but that they differ only in terms of *county-specific* factors

Testing for Endogeneity

- Decompose the error term as

$$\nu_{p,t} = \chi \Delta z_p + \tilde{\nu}_{p,t}$$

- Rewrite the empirical specification as

$$\Delta x_{p,t} = \alpha \Delta b_{p,t} + \lambda_p' F_t + \chi \Delta z_p + \tilde{\nu}_{p,t}$$

  for a (possibly) nonzero coefficient χ

- If we do not control for Δz_p and $\chi \neq 0$ then α will be biased

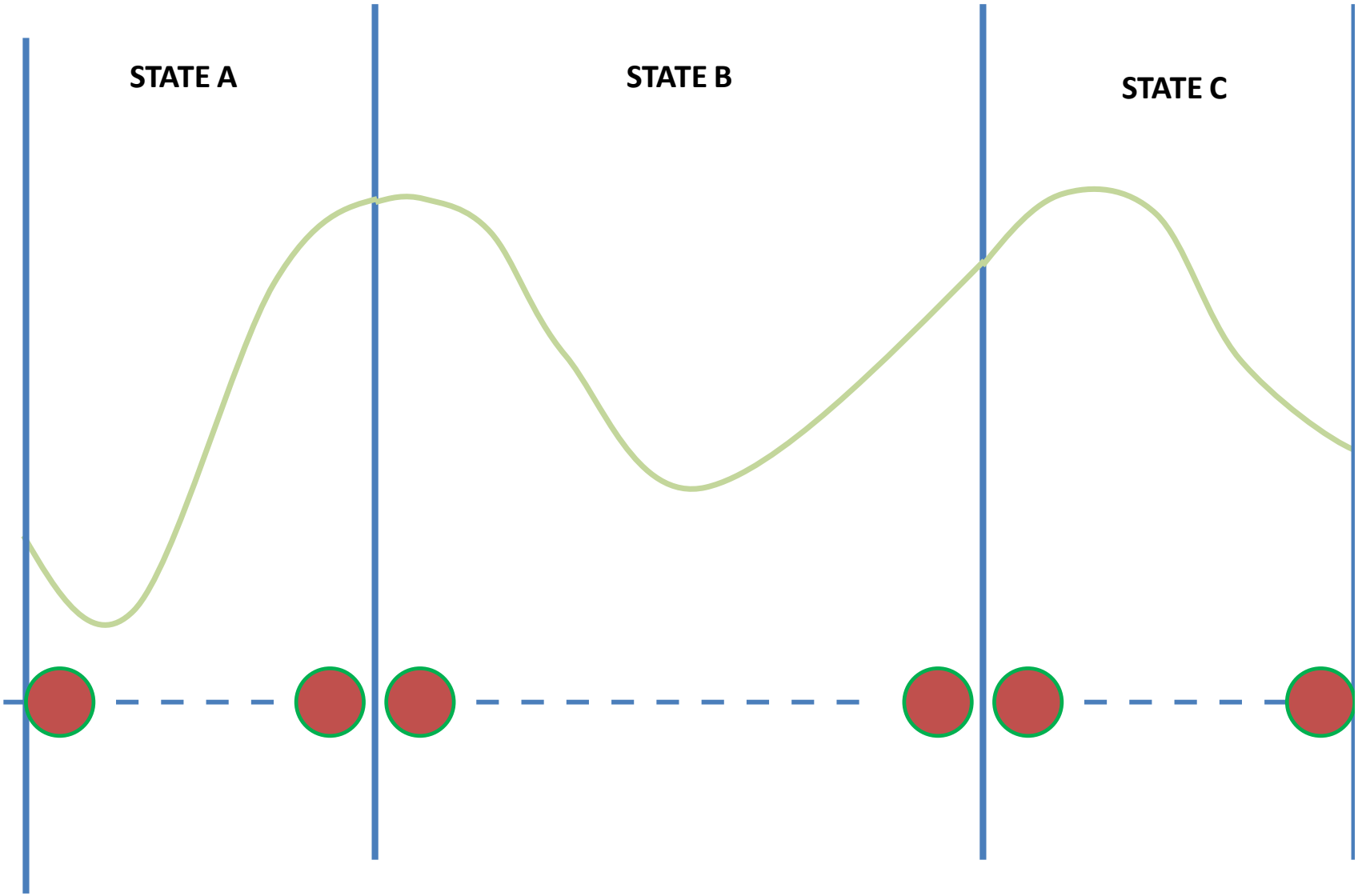
- If state related factors cancel when we difference, we should find $\chi = 0$ in the above specification

Testing for Endogeneity

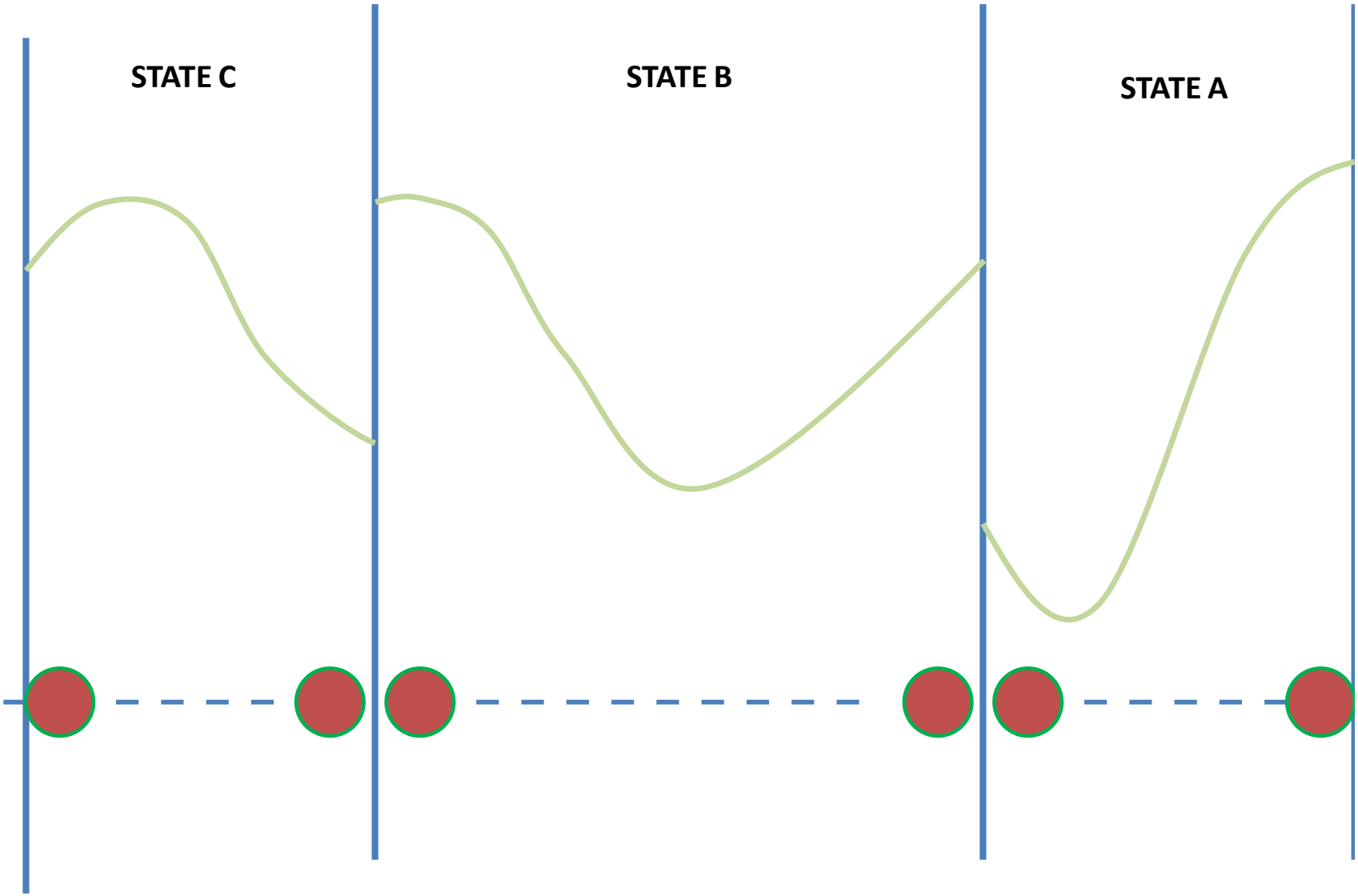
VARIABLES	(1)	(2)	(3)
Weeks of	**0.0421**	**0.0464**	**0.0442**
Benefits	(0.000)	(0.000)	(0.048)
State GDP		-0.032	
per Worker		(0.098)	
BARTIK-Instrumented			-0.0713
State Unemployment			(0.795)
Observations	37,177	37,177	35,205
R-squared	0.458	0.460	0.565

Note - p-values (in parentheses) calculated via bootstrap. Bold indicates $p < 0.05$.

Identification



Scrambled Counties



Scrambled Border Counties

- Form "scrambled pairs" by randomly assigning border counties to create a new dataset
- These counties are not expected to have similar labor markets

$$Corr(\nu_{p,t}^{S}, \Delta z_p) \neq 0$$

- This specification should yield a biased α since $\nu_{p,t}^{S}$ is correlated with $\Delta b_{p,t}$
- Controlling for Δz_p should yield a negative value for χ

Scrambled Border County Sample

VARIABLES	(1)	(4)	(5)	(6)
	Baseline	*Scrambled Sample*		
Weeks of Benefits	**0.0421** (0.000)	**0.1082** (0.000)	**0.0960** (0.000)	-0.0074 (0.811)
State GDP per Worker			**-0.0821** (0.001)	
BARTIK-Instrumented State Unemployment				**-1.414** (0.000)
Observations	37,177	37,177	37,177	35,205
R-squared	0.458	0.642	0.642	0.642

Note - p-values (in parentheses) calculated via bootstrap. Bold indicates $p < 0.05$.

LAUS Data Quality

County unemployment data is constructed from administrative data but some components (new entrants and re-entrants) are imputed. Could cause a bias to the extent that imputation reflects state-level variables.

- Imputation is based on aggregate CPS relationships.
- The only place where state-level factors may potentially enter is the additivity adjustment.
  - We obtain adjustment factors from the BLS and undoing the adjustment has no impact on our results.
- The endogeneity test above showed that this correction does not induce a bias ($\chi = 0$).

Claims Data

Can perform our analysis on administrative claims data from state UI system.

- Direct count of claims by county (no imputation).
  - Continuing claims on 12^{th} of each month for regular state UI program, weeks 2-26.
  - Weekly final payments count in regular state UI program, week 26 (by BLS-defined Labor Market Area).
- Restrict sample to single county LMAs and combine these data to estimate job finding rates for regular UI benefit recipients for each time period t by county.
- 278 border county pairs, for the total of 8,896 observations.

Claims Results

- Applying our baseline specification to job finding rates computed on administrative claims data we get $\alpha_f = -0.0606$, p-value 0.05.
- Using the average unemployment rate of 7.1% over this period, we get: $\alpha_u \approx \alpha_f(1-u) = 0.0564$.
- Using LAUS unemployment data and reestimating our baseine specification on this sample yields $\alpha_u = 0.0499$, p-value 0.0.
- Thus, the effects of benefit extensions on unemployment estimated on LAUS unemployment data is completely consistent with that implied by claims data.

Roadmap of Empirical Results

1. Exploring Performance of the Specification
    - 1.1 Controlling for Industrial Composition
    - 1.2 Core Based Statistical Area Sample
    - 1.3 Other Benefit Measures
    - 1.4 2001 Recession
2. Controlling for other State Polices
    - 2.1 Expansion of Food-Stamps Programs
    - 2.2 Variation in State Foreclosure Policies
    - 2.3 Controlling for Stimulus Spending
    - 2.4 Controlling for State Tax Policies
    - 2.5 Controlling for State Regulatory Policies
3. The Role of Macro Effects
    - 3.1 Evidence on Vacancy Creation
    - 3.2 Evidence on Employment
    - 3.3 Evidence on Wages

Evidence: Job Creation, Employment, Wages

VARIABLES	Vacancies	Tightness	QCEW Emp	QWI Emp	Wages
	(1)	(2)	(3)	(4)	(5)
Benefits	**-0.042**	**-0.086**	**-0.0030**	**-0.0038**	**0.0099**
	(0.020)	(0.000)	(0.035)	(0.000)	(0.070)
N. factors	1	1	4	3	2
Obs.	34,617	34,617	36,971	36,962	36,962
R^2	0.104	0.102	0.959	0.930	0.550

Note - p-values (in parentheses) calculated via bootstrap. Bold indicates $p < 0.1$.

Results consistent with key mechanism in DMP

Conclusion

- Two challenges to empirical work in macroeconomics: Expectations and Endogeneity.
- We develop and validate new empirical methodology needed to control for expectations in the measurement of the effect of unemployment benefits extensions on unemployment.
- Use existing methodology (and provided new tests) to overcome endogeneity.
- Unemployment benefit extensions have sizeable effects on unemployment, employment and vacancies.
- Our results are an important input to assess the aggregate and welfare consequences of UI policies.
- All quantitative magnitudes are consistent with the standard Mortensen-Pissarides model.

Appendix Slides

Correction for Mobility Induced by Changes in Benefits

- Assumed so far that county labor markets are closed
- Unemployed workers may change how they direct their search across state boundaries in response to changes in unemployment benefit policy
- We impute the search behavior within a pair to derive the (potential) correction

Accounting for Labor Mobility

Consider two counties, A, B. The fraction of workers searching in their home county is x. Effective searchers in each county:

$$\tilde{u}_t^A = u_t^A x_t^A + (1 - x_t^B) u_t^B$$
$$\tilde{u}_t^B = u_t^B x_t^B + (1 - x_t^A) u_t^A$$

We can calculate the probability of finding a job for someone who lives in each respective county:

$$\phi_t^A = \frac{u_t^A - u_{t+1}^A + s_t^u \left(n_t^A - u_t^A\right)}{u_t^A} = x_t^A f\left(\frac{v_t^A}{\tilde{u}_t^A}\right) + \left(1 - x_t^A\right) f\left(\frac{v_t^B}{\tilde{u}_t^B}\right)$$
$$\phi_t^B = \frac{u_t^A - u_{t+1}^B + s_t^u \left(n_t^B - u_t^B\right)}{u_t^B} = x_t^B f\left(\frac{v_t^B}{\tilde{u}_t^B}\right) + \left(1 - x_t^B\right) f\left(\frac{v_t^A}{\tilde{u}_t^A}\right)$$

where: s_t^u is the separation rate into unemployment.

Imputing Mobility Effects

To identify x_t^A, x_t^B:

- Assume Cobb-Douglas matching function $\mu u^{\alpha} v^{1-\alpha}$.
- We allow μ to change over time, to capture any possible time trends in the adoption of online vacancies
- The algorithm consists of selecting α, $\{\mu_t, x_t^A, x_t^B\}_{t=1}^T$ to minimize the error in the following equations:

$$\begin{aligned}
\phi_t^A &= x_t^A f\left(\frac{v_t^A}{\tilde{u}_t^A}\right) + \left(1 - x_t^A\right) f\left(\frac{v_t^B}{\tilde{u}_t^B}\right) \\
\phi_t^B &= x_t^B f\left(\frac{v_t^B}{\tilde{u}_t^B}\right) + \left(1 - x_t^B\right) f\left(\frac{v_t^A}{\tilde{u}_t^A}\right) \\
\frac{q\left(\frac{v_t^A}{\tilde{u}_t^A}\right)}{q\left(\frac{v_t^B}{\tilde{u}_t^B}\right)} &= \left(\frac{\frac{v_t^B}{\tilde{u}_t^B}}{\frac{v_t^A}{\tilde{u}_t^A}}\right)^{\alpha}
\end{aligned}$$

where we observe all left hand side variables for all t

Effect of Unemployment Benefit Extensions on Imputed Labor Market Variables

VARIABLES	Out-of-State Work	Imputed Tightness	Imputed Job-Finding
Weeks of Benefits	-0.0002	-0.1154***	-0.0524**
	(0.510)	(0.000)	(0.000)
N. factors	2	2	2
Observations	29,492	29,492	29,492
R-squared	0.066	0.282	0.300

Note: p-values (in parentheses) calculated via bootstrap.
*** p<0.01, ** p<0.05, * p<0.1

Confirmation in Data

- Imputation procedure implies no correction necessary for mobility. Does this line up with limited evidence in data?
- Using the American Community Survey from the Census, we can compute what fraction of workers in each border county work in their home state and the neighboring state
- Test to see if the fraction working across state border changes with benefits

Mobility Effects in ACS

	Migration	
VARIABLES	Quasi-Difference	Diff-in-Diff
Weeks of Benefits	-0.3560	0.1737
	(1.125)	(1.267)
Pair Fixed Effects	Yes	No
Observations	76	76
R-squared	0.770	0.115

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Standard Errors

To account for the correlation in the residuals

- across counties and
- across time,

follow Bertrand, Duflo, and Mullainathan (2004) and use block-bootstrap on state border segments to compute standard errors.

Main Data Sources

- County unemployment comes from the Local Area Unemployment Statistics (LAUS) from the Bureau of Labor Statistics
- County private sector employment and wages come from the Quarterly Workforce Indicators (QWI)
- Vacancy data are from Help Wanted Online Index (HWOL) from The Conference Board
- Separations data are from Job Openings and Labor Turnover Survey (JOLTS)
- State GDP is from the Regional Economic Accounts of the Bureau of Economic Analysis
- Benefit eligibility form Department of Labor trigger reports

Border Counties

We focus analysis on sample of county pairs that are in different states but share a border:

- 1,107 such county pairs, 1,079 have different benefits for at least one quarter
- Median county pair has different benefit durations for 11 quarters from 2008-2012
- Ranges from 0 quarters to 17 quarters of differing benefit durations

Controlling for Industrial Composition

VARIABLES	Baseline	Similar Composition
Weeks of Benefits	0.049***	0.053***
	(0.000)	(0.000)
Number of Factors	2	2
Observations	37,177	18,588
R-squared	0.468	0.432

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Border Counties from Same Core Based Statistical Areas

VARIABLES	Baseline	CBSA Sample
Weeks of Benefits	0.049***	0.048***
	(0.000)	(0.000)
Number of Factors	2	2
Observations	37,177	26,024
R-squared	0.460	0.465

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Perfect Foresight Benefit Duration Measure

VARIABLES	Baseline	Perfect Foresight
Weeks of Benefits	0.049***	0.051***
	(0.000)	(0.000)
Number of Factors	2	2
Observations	37,177	37,177
R-squared	0.460	0.447

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

2001 Recession

VARIABLES	Baseline	1996-2004 Sample
Weeks of Benefits	0.049*** (0.000)	0.0579*** (0.000)
Number of Factors	2	3
Observations	37,177	48,611
R-squared	0.458	0.405

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Controlling for Expansion of Food-Stamps

VARIABLES	Unemployment	Unemployment	Unemployment
Weeks of Benefits	0.049***	0.041***	0.046***
	(0.000)	(0.000)	(0.000)
SNAP Broad Eligibility		0.0115***	
		(0.000)	
SNAP Spending			0.0069**
			(0.040)
Number of Factors	2	2	2
Observations	37,177	37,177	37,177
R-squared	0.458	0.460	0.458

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Variation in State Foreclosure Policies

VARIABLES	Unemployment	Unemployment
Weeks of Benefits	0.049***	0.0486***
	(0.000)	(0.000)
Foreclosure Policy		0.0007
		(0.385)
Number of Factors	2	2
Observations	37,177	37,177
R-squared	0.458	0.461

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Controlling for Stimulus Spending

VARIABLES	Unemployment	Unemployment
Weeks of Benefits	0.049***	0.0613***
	(0.000)	(0.000)
Stimulus Spending per Capita		0.0007
		(0.210)
Number of Factors	2	2
Observations	37,177	37,177
R-squared	0.460	0.465

Bootstrap p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

◂ Stimulus Spendings in Levels

◂ Return

Controlling for State Tax Policies

VARIABLES	Unemp.	Unemp.	Unemp.	Unemp.
Weeks of Benefits	0.049***	0.0428***	0.0441***	0.0480***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Tax Revenue		0.0029***		
		(0.000)		
Sales Tax Revenue			0.0019	
			(0.000)	
Income Tax Revenue				-0.0009
				(0.000)
Factors	2	2	2	2
Obs.	37,177	37,177	37,177	37,177
R^2	0.458	0.464	0.465	0.461

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return ◂ Tax Revenues Relative to State GDP

Controlling for State Regulatory Policies

VARIABLES	Unemp.	Unemp.	Unemp.	Unemp.
Weeks of Benefits	0.0490***	0.0489***	0.0489***	0.0484***
	(0.000)	(0.000)	(0.000)	(0.000)
SBSI		-0.0002		
		(0.600)		
SBTCI			0.0012	
			(0.455)	
BHI				0.0007
				(0.315)
Factors	2	2	2	2
Obs.	37,177	37,177	37,177	37,177
R^2	0.458	0.462	0.464	0.462

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Understanding the Macro Effect: Evidence on Job Creation

VARIABLES	Vacancies (1)	Tightness (2)	Employment (3)
Weeks of Benefits	-0.0631***	-0.1067***	-0.0035*
	(0.000)	(0.000)	(0.1)
N. factors	2	2	2
Observations	29,492	29,492	29,600
R-squared	0.175	0.178	0.933

Note: p-values (in parentheses) calculated via bootstrap.
*** p<0.01, ** p<0.05, * p<0.1

▸ Consistency with the Matching Function

◂ Return

Interpreting the Coefficients

- Inputs:
  - Coefficient for employment 0.0035
  - Quarterly discount rate of 1%
  - Quarterly separation rate from the data

- We can compute the effect of permanently extending benefits to 99 weeks:

$$\frac{-0.0035}{1-\beta(1-s)} \times (\log(99) - \log(26)) = -0.043$$

  or an decrease in the employment rate from 95% to 91%.

- This 4 percentage point decrease in employment is comparable in magnitude to the 5.5 percentage point increase in unemployment rate found above.

Reallocation of Activity across Counties?

- Results based on differences across border counties.
- Could pick up reallocation of activity across counties in responce to differences in benefits.
- Unlikely because differences in benefits are relatively small and temporary.
- Consider the effect of benefit extensions on employment in sectors that are generally considered non-tradable. The coefficient on employment are:
  - -0.013 in retail industry,
  - -0.015 in food services.

  Both significant at 1%.
- No change in cross-border shopping in Kilts Nielsen data

Understanding the Macro Effect: Evidence on Wages

The macro effect explanation implies that wages should go up in response to benefit extensions. We test this implication using county-level data on wages.

- The decline in local job finding rate in response to extensions might affect sorting of new hires into new matches.
- To control for selection, we need to construct average wages for people that are employed for 2 consecutive full quarters in the same county.
- Difference this measure over counties and over time.
- Run on (differenced) benefit durations.

Understanding the Macro Effect: Evidence on Wages

VARIABLES	Wages of Job Stayers
Weeks of Benefits	0.0114**
	(0.025)
Number of Factors	2
Observations	29,549
R-squared	0.457

Bootstrap p-values in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

▸ Wages of New Hires

◂ Return

Validation using Model Generated Data

- We extend the Mortensen and Pissarides model to allow for benefit expiration
- Two states with MP labor markets
- Each state has a small border county with a MP labor market
- Benefit extensions as in EB program triggered by state unemployment
- Target the coefficient of benefits on unemployment estimated above.

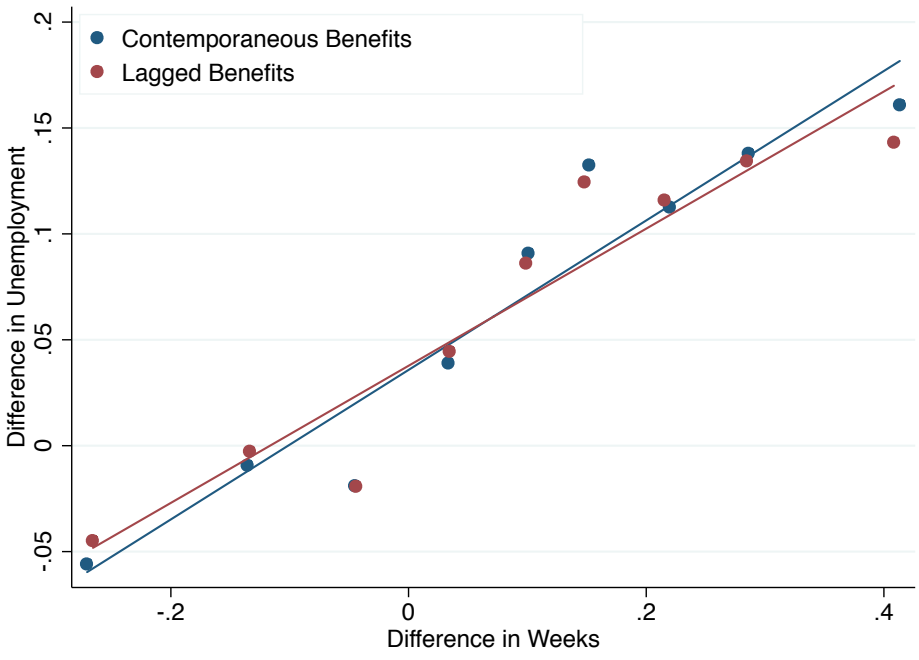
Estimation using Model Generated Data

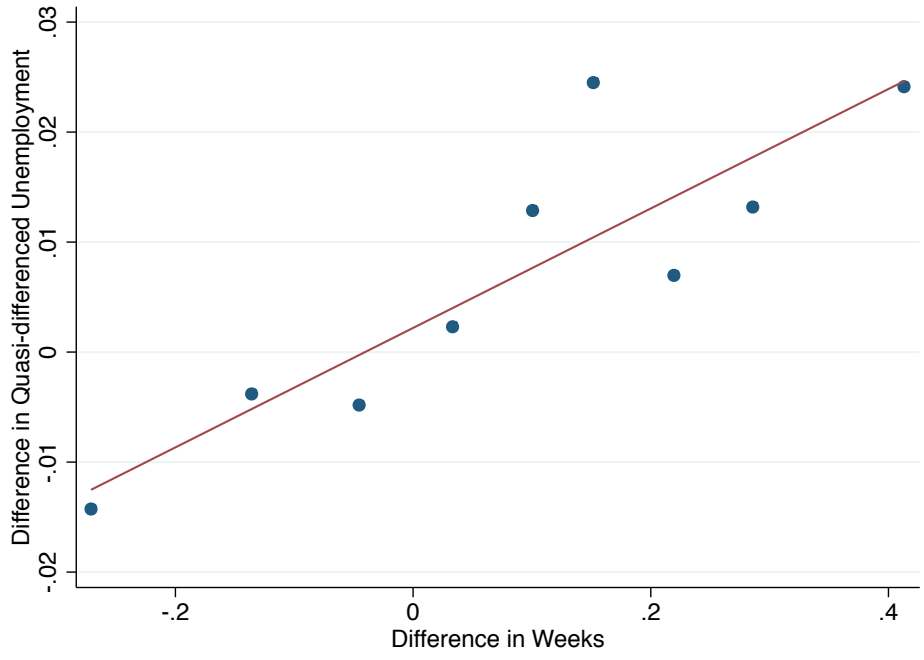
Permanent Effect of a 13 Week Benefit Increase			
	(1)	(2)	(3)
VARIABLES	Unemp.	Tightness	Vacancies
Data	0.227	-0.378	-0.231
Model	0.227	-0.388	-0.225

- Note: no endogenous search intensity decision in the model.
- Micro elasticity is zero, similar to the empirical estimates.
- Response of unemployment is driven entirely by the macro effect of benefit extensions on vacancy creation.

Under the Hood of the Quasi-Difference

- An increase in benefit duration leads to higher current, future, and quasi-differenced unemployment.
- $\tilde{x}_t := \log(x_t) - \beta(1 - s_t)\log(x_{t+1})$



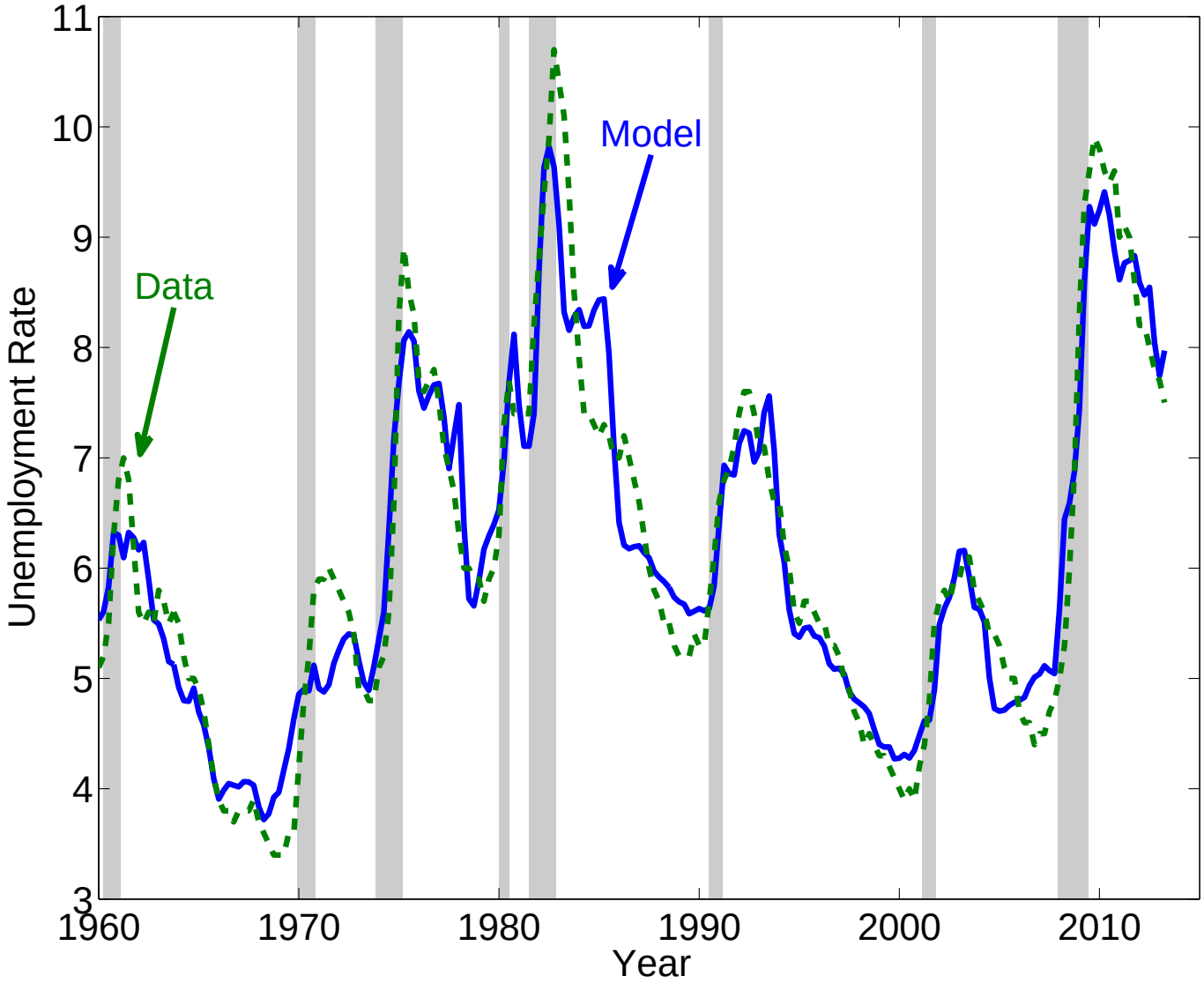


Implications for Macro Models

Implications for Macro Models

- Modify standard DMP model to allow for benefit expiration.
- Pick parameters to match elasticity calculated here.
- Feed in changes in benefit durations over last 50 years and productivity.
- Details - Mitman and Rabinovich (2013).

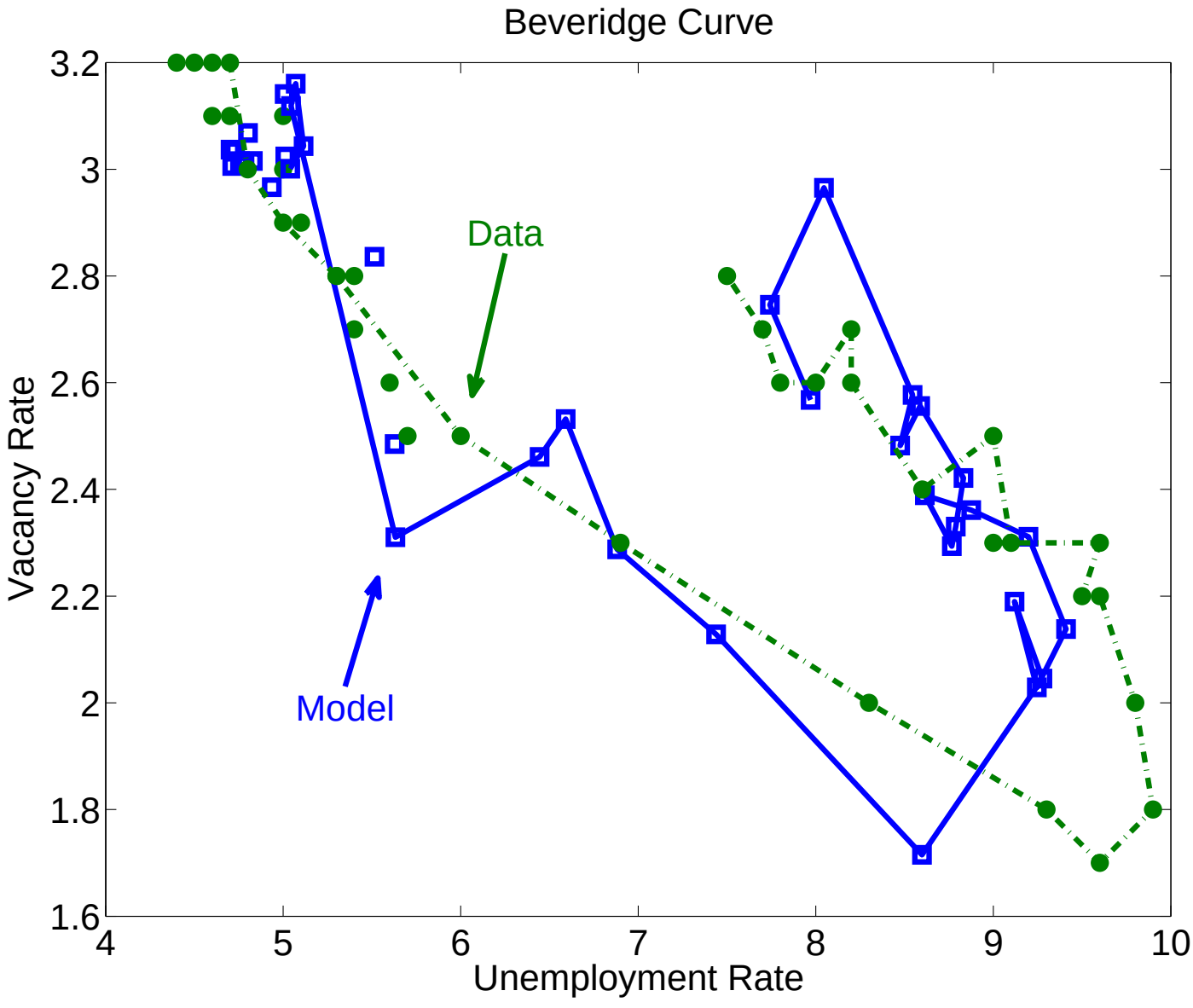
Unemployment Rate: Data vs. Model



Mitman and Rabinovich (2013)

▸ Inputs

The Beveridge Curve: Data vs. Model



Mitman and Rabinovich (2013)

Our Findings in Context of the Literature

- Classic research on UI system records exploiting cross-state heterogeneity in the recession of 1980s, e.g. Moffitt and Nicholson (1982), Moffitt (1985), Katz and Meyer (1990a).
  - *A 1 week increase in benefit duration increases average duration of unemployment spells by 0.1 to 0.2 weeks.*

- Over the Great Recession benefit duration increased from 26 to 99 weeks, or by 73 weeks. Average unemployment duration must have risen by between 7.3 and 14.6 weeks.

- Doubling of unemployment duration roughly doubles the unemployment rate. Stronger impact than what we find.

Concerns:

1. Does the job finding rate of ineligible workers respond as much as that of the eligible ones to benefit extensions? The key contribution of Rothstein (2011) is to show that it does.
2. Times have changed? Endogeneity biases in that work?

Card and Levine (2000)

- Effect of 1996 benefit extension in New Jersey from 26 to 39 weeks.
- UI leaving rate decreases by 16.6%.
- This increases unemployment by 16.6 *(1-u) = 15.8%
- In our setting, a permanent increase from 26 to 39 weeks with a current impact of α gives

$$\alpha \times \frac{1}{1-\beta(1-s)} \times (\log(39) - \log(26)) = \alpha * 3.72$$

- We find $\alpha = 0.04$ by solving
  $\alpha * 3.72 = log(0.05 * 1.158) - log(0.05) = 0.149$
- If take into a count that extension was for 6 month only, we get $\alpha = 0.2$.
- Of course, results apply to NJ only.

Appendix Slides

Accounting for Labor Mobility: Sketch

Consider two counties, A, B. The fraction of workers searching in their home county is x. The effective searchers in each county is:

$$\tilde{u}_t^A = u_t^A x_t^A + (1 - x_t^B) u_t^B$$
$$\tilde{u}_t^B = u_t^B x_t^B + (1 - x_t^A) u_t^A$$

Solve for x_t^A, x_t^B using observed job finding rates of county residents:

$$\begin{aligned} \phi_t^A &= x_t^A f\left(\frac{v_t^A}{\tilde{u}_t^A}\right) + (1 - x_t^A)\, f\left(\frac{v_t^B}{\tilde{u}_t^B}\right) \\ \phi_t^B &= x_t^B f\left(\frac{v_t^B}{\tilde{u}_t^B}\right) + (1 - x_t^B)\, f\left(\frac{v_t^A}{\tilde{u}_t^A}\right) \end{aligned}$$

Key Finding: Unemployed workers do not change how they direct their search across state boundaries in response to changes in unemployment benefit policy

Appendix Slides TOC

"... our citizens are fast returning, from the panic into which they were artfully thrown to the dictates of their own reason; and I believe the delusions they have seen themselves hurried into will be useful as a lesson under similar attempts on them in future... If we can prevent the government from wasting the labors of the people, under the pretence of taking care of them, they must become happy."

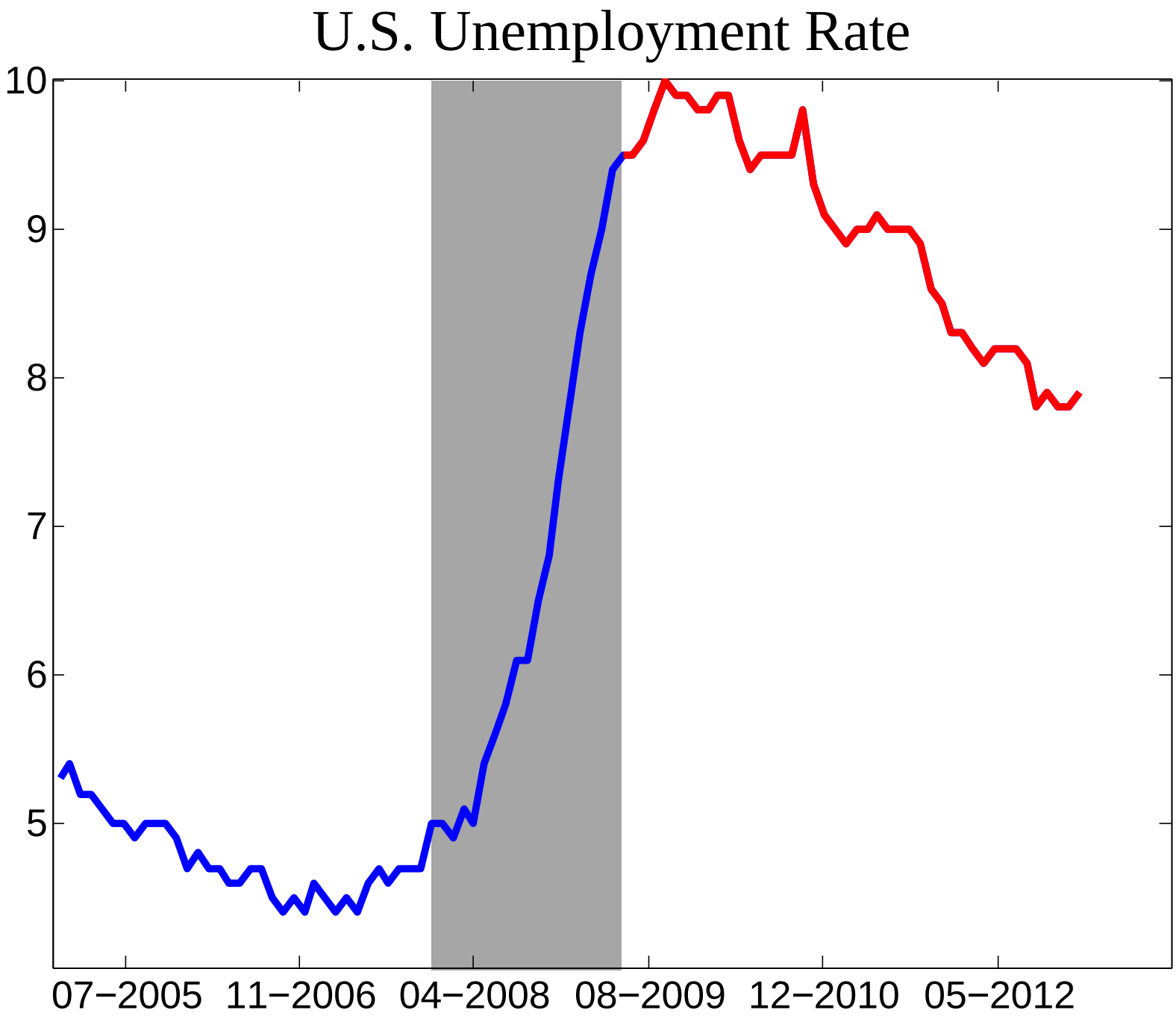
Thomas Jefferson
Letter to Thomas Cooper
November 29, 1802

"One bit of evidence for the neglect of labor demand by mainstream labor economists is a recent monograph on empirical labor economics that is divided into "halves" dealing with supply and demand (Devine and Kiefer, 1991). The second "half" takes up 14 pages of the 300-page book!"

Dan Hammermesh

"We just got a jobs report today showing that we've now seen the fastest job growth in the United States in the first half of the year since 1999. (Applause.) So this is also the first time we've seen five consecutive months of job growth over 200,000 since 1999. (Applause.) And we've seen the quickest drop in unemployment in 30 years."

Barack Obama
Remarks on the Economy
July 3, 2014


U.S. Unemployment Rate
10
9
8
7
6
5
07−2005
11−2006
04−2008
08−2009
12−2010
05−2012

Help Wanted Online

- The HWOL is a monthly dataset.
- Covers universe of vacancies advertised on 16,000 online job boards and online newspapers
- Started in May 2005
- Broadly lines up with aggregate JOLTS data

Unemployment Benefits

- We obtain data on weeks of benefits available by state from trigger reports provided by the Department of Labor.
- Two main programs:
  1. Extended Benefits (EB) program
  2. Emergency Unemployment Compensation (EUC08) program

Unemployment Benefits

EB program:

- "Automatic stabilizer" since 1970
- Provides 13 or 20 weeks depending on state conditions
- Joint state-federal program
- American Recovery and Reinvestment Act of 2009 made EB fully federally financed

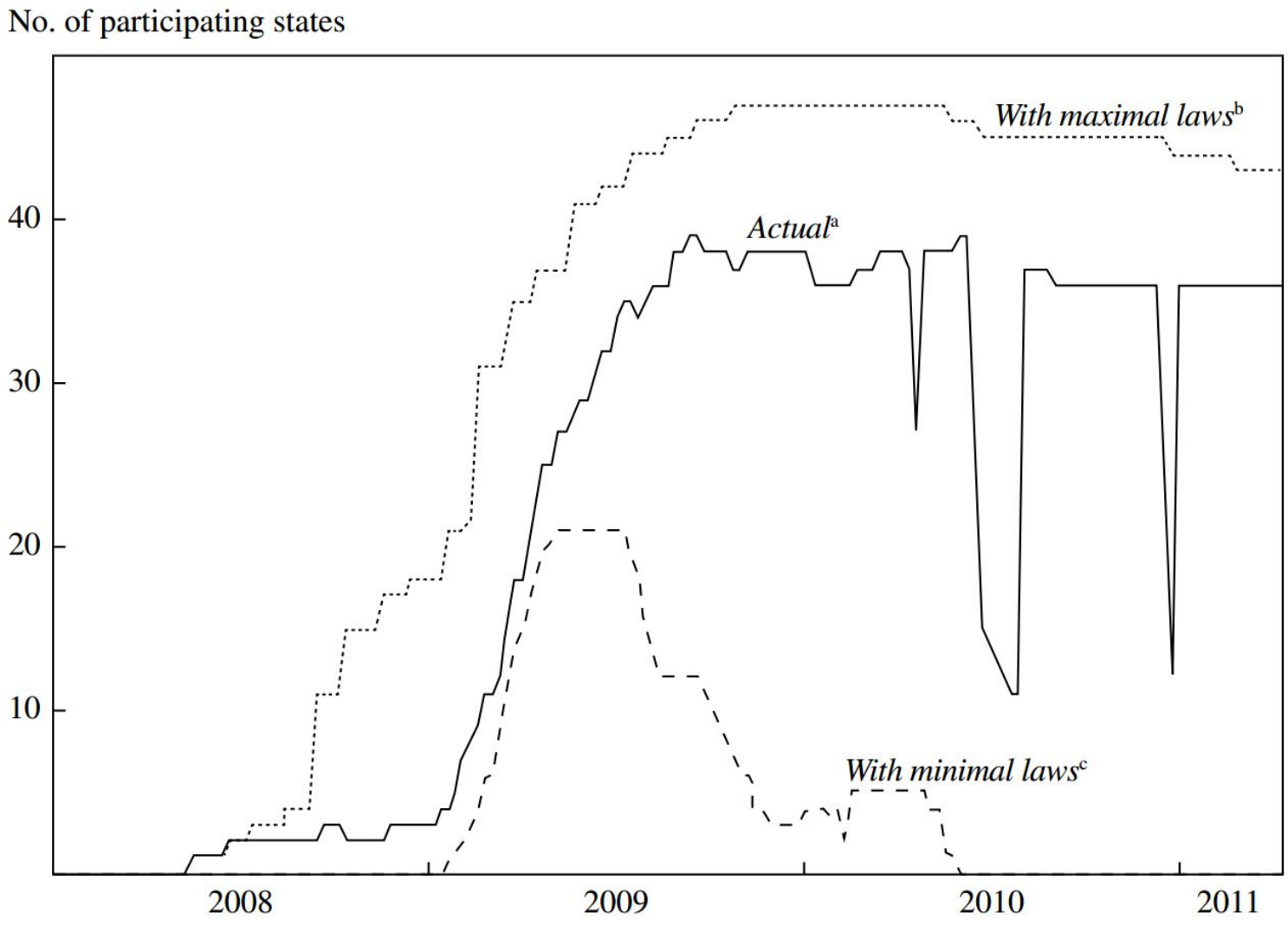
EUC08 program:

- Enacted in June 2008
- Federal program from onset
- Four tiers of benefits providing up to 53 additional weeks of benefits

Emergency Unemployment Compensation

Date[a]	*Weeks of benefits available under EUC tier*				*Scheduled EUC expiration*
	I	*II*	*III*[b]	*IV*[c]	
Jun. 30, 2008	13				Mar. 28, 2009
Nov. 21, 2008	20	13[b]			Mar. 28, 2009
Feb. 17, 2009	20	13[b]			Dec. 26, 2009
Nov. 6, 2009	20	14	13	6	Dec. 26, 2009
Dec. 19, 2009	20	14	13	6	Feb. 28, 2010
Feb. 28, 2010	0	0	0	0	NA
Mar. 2, 2010	20	14	13	6	Apr. 5, 2010
Apr. 5, 2010	0	0	0	0	NA
Apr. 15, 2010	20	14	13	6	Jun. 2, 2010
Jun. 2, 2010	0	0	0	0	NA
Jul. 22, 2010	20	14	13	6	Nov. 30, 2010
Nov. 30, 2010	0	0	0	0	NA
Dec. 17, 2010	20	14	13	6	Jan. 3, 2012
Dec. 23, 2011	20	14	13	6	Mar. 6, 2012[d]

Extended Benefits Program



Data Aggregation

Unemployment, vacancy and benefit durations available monthly

Separation data only available quarterly:

- Aggregate monthly data to quarterly
- Take logs after aggregation
- Tightness=quarterly vacancies/quarterly unemployment

Praise of Dube et al (2010) Methodology

- *"This is one of the best and most convincing minimum wage papers in recent years."* –Lawrence Katz, Professor of Economics at Harvard; Editor, Quarterly Journal of Economics.
- *"The paper presents a fairly irrefutable case that state minimum wage laws do raise earnings in low wage jobs but do not reduce employment to any meaningful degree."*–David Autor, Professor of Economics at MIT; Editor, Journal of Economic Perspectives
- *"This paper boldly steps into the hornet's nest of a literature on the employment effects of minimum wage laws. Since the seminal Card and Krueger paper in the 1994 American Economic Review, this literature has been a mess of conflicting findings. As a result the economics profession has been unable to provide a clear message on this vital question of public policy. The bottom line is that the paper has "fixed" this literature and affirmed Card and Krueger's original finding that minimum wage laws do not appear to have adverse employment effects."* –Michael Greenstone, Professor of Economics at MIT; Director of the Hamilton Project at the Brookings Institution.

Matching Efficiency

Consider a Cobb-Douglas matching function:

$$M(u,v) = \mu v^{1/2} u^{1/2}$$

The job finding rate is given by:

$$f = \mu \theta^{1/2}$$

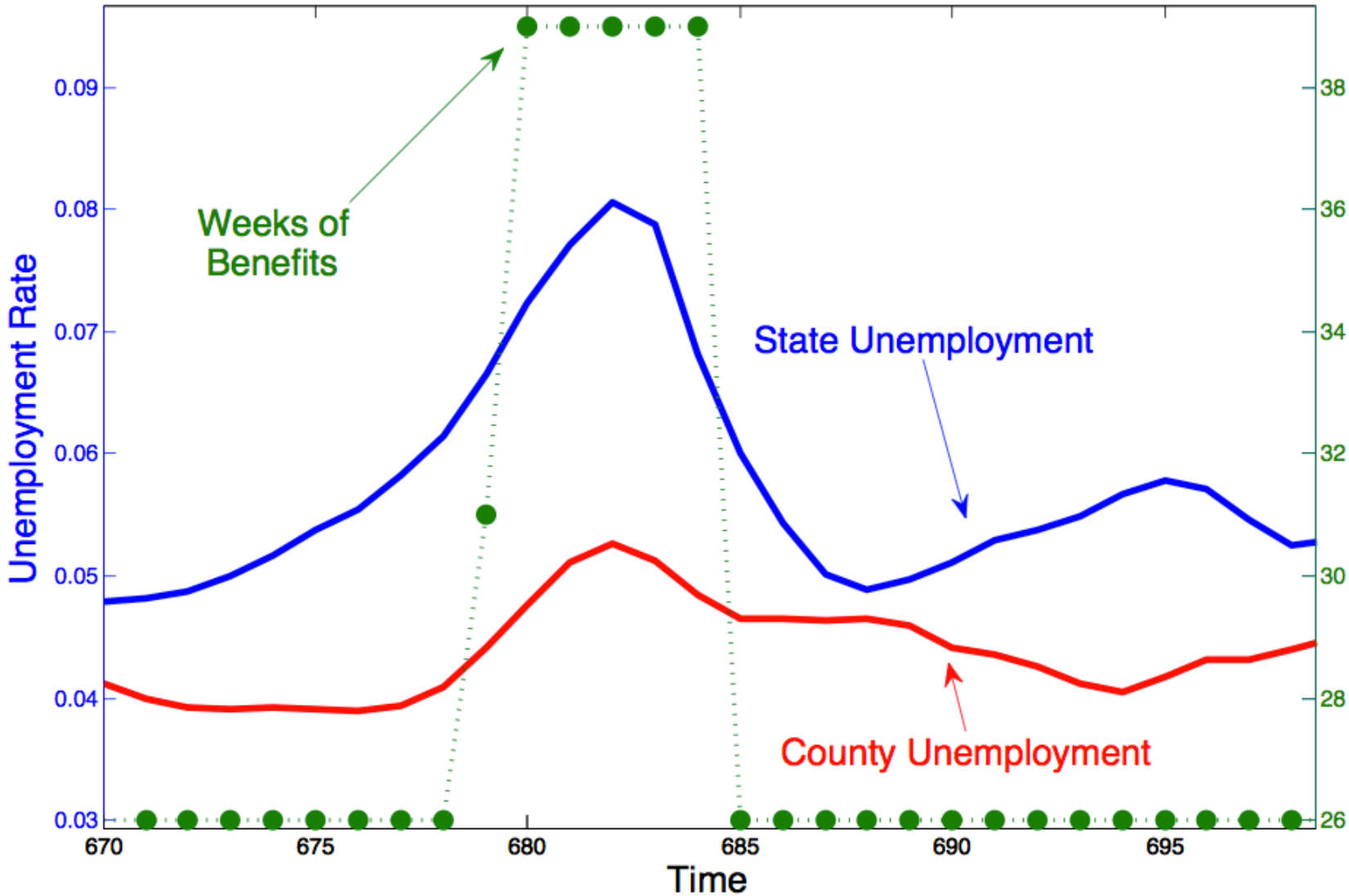
Total change in unemployment: -0.607.

Effects on unemployment, Δu, operate entirely through changes in job-finding rate, Δf:

$$\begin{aligned} \Delta u &\approx -\Delta f = \underbrace{-\Delta \mu}_{\text{Matching efficiency}} - \underbrace{1/2 \Delta \theta}_{\text{Job creation}} \\ -0.049 &= -\Delta \mu - 1/2 \times (-0.1029) \\ &\Rightarrow \Delta \mu = 0.009 \end{aligned}$$

Back

Model County and State Unemployment



Back

Firm Profits

- Firm profit is given by

$$\log(\pi_t) = \gamma_z \log(z_t) - \gamma_b \log(b_t),$$

  z_t is worker's productivity, b_t are benefits.

- Value of a filled firm is:

$$J_t = \pi_t + \beta(1 - s_t)E_t J_{t+1},$$

  β discount factor, s separation rate.

- Substituting $\log(\theta_{t+1}) = \kappa \log(J_{t+1})$ yields:

$$\log(\theta_t) = \kappa(1-\beta(1-s^*)) \log(\pi_t)+\beta(1-s_t) \log(\theta_{t+1})+\log(\epsilon_t).$$

Free Entry

Free entry implies that the expected cost of posting a vacancy is equal to the value of a filled job:

$$c = q(\theta_t) J_t,$$

$q(\theta_t)$ is the probability to fill a vacancy, c is the cost of maintaining a vacancy.

$$\log(\theta_t) = \kappa \log(J_t).$$

Deriving the Specification

- Steady state profit $\pi^* = J^*(1 - \beta(1 - s^*))$
- Expanding around the steady state:

$$\log(\theta_t) = \kappa \frac{\pi^*}{J^*} \log(\pi_t) + \kappa\beta(1 - s_t) \log(J_{t+1}) + \log(\epsilon_t),$$

where $\log(\epsilon_t)$ is expectation error.

- Substituting $\log(\theta_{t+1}) = \kappa \log(J_{t+1})$ yields:

$$\log(\theta_t) = \kappa(1-\beta(1-s^*)) \log(\pi_t)+\beta(1-s_t) \log(\theta_{t+1})+\log(\epsilon_t).$$

▸ Surplus ▸ Back

Quasi-Difference using Surplus

Using the flow equation for the surplus

$$S_t = z - (b + \beta f(\theta_t)\xi E_t S_{t+1}) + \beta(1-s)E_t S_{t+1}.$$

and the free entry condition

$$\kappa = \beta q(\theta_t)(1-\xi)E_t S_{t+1},$$

we can derive the quasi-difference equation in $q(\theta)$:

$$\frac{1}{q(\theta_t)} = (1-\xi)\beta\frac{(z'-b')}{\kappa} - \beta\xi\theta_{t+1} + \frac{(1-s)\beta}{q(\theta_{t+1})}.$$

Log-linearizing and rearranging:

$$log(\theta_t) = (\gamma_z log(z') - \gamma_b \log(b')) - \frac{\beta\xi}{\kappa}\overline{f}\log(\theta_{t+1}) + (1-s)\beta\log(\theta_{t+1})$$

▸ Back

Controlling for Stimulus Spending

VARIABLES	Unemployment	Unemployment
Weeks of	0.049***	0.0610***
Benefits	(0.000)	(0.000)
Stimulus Spending		0.0008***
Total		(0.000)
Number of Factors	2	2
Observations	37,177	37,177
R-squared	0.460	0.463

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Controlling for State Tax Policies

VARIABLES	Unemp.	Unemp.	Unemp.	Unemp.
Weeks of Benefits	0.049***	0.0609***	0.0591***	0.0606***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Tax Revenue/GDP		-0.0047		
		(0.140)		
Sales Tax Revenue/GDP			0.0005	
			(0.720)	
Income Tax Revenue/GDP				-0.0044*
				(0.095)
Factors	2	2	2	2
Obs.	37,177	37,177	37,177	37,177
R^2	0.460	0.461	0.465	0.460

Bootstrap p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

◂ Return

Wages of New Hires

VARIABLES	(1) Wages of New Hires
Weeks of Benefits	0.0752**
	(0.033)
Number of Factors	1
R-squared	0.133

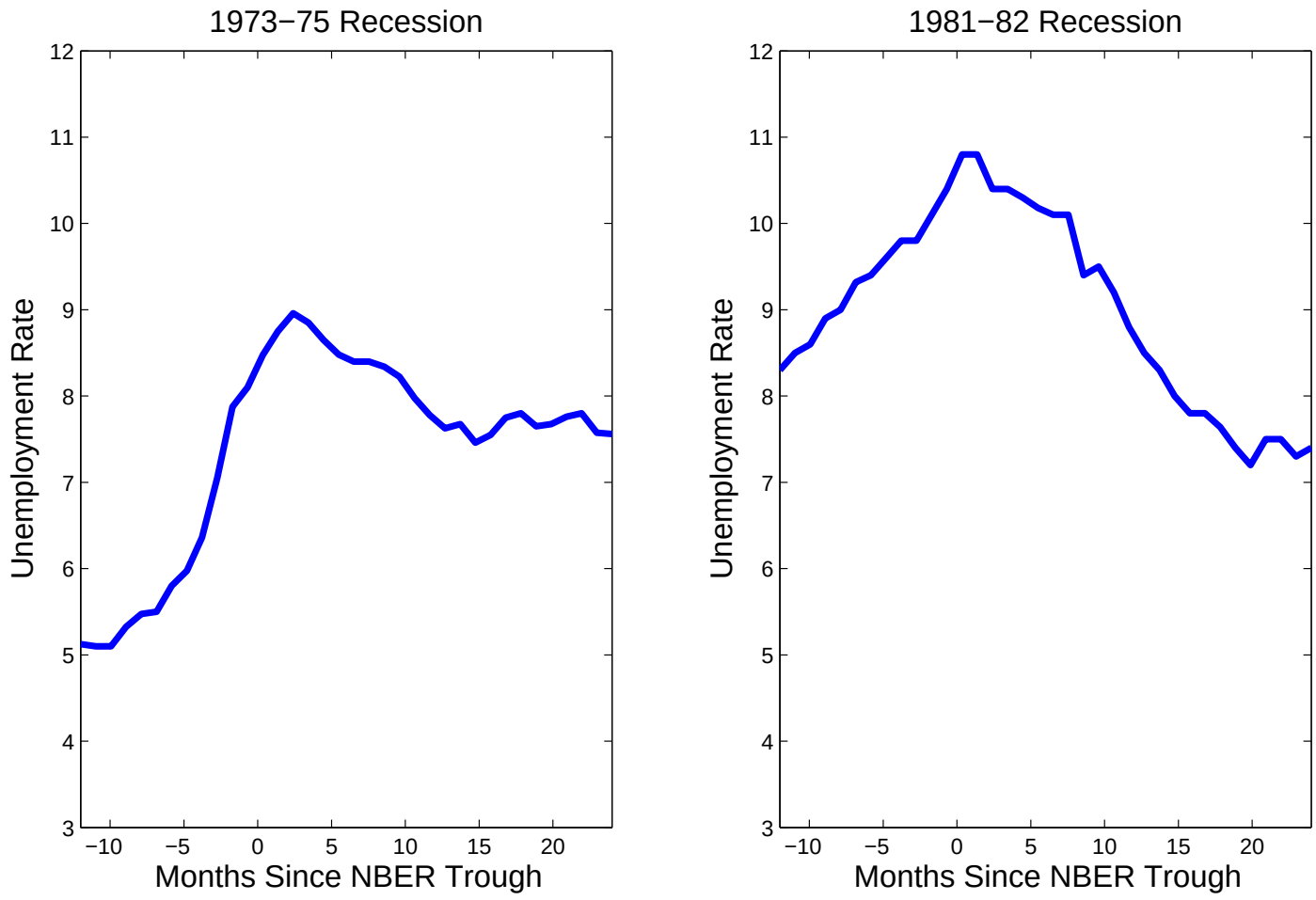
P-values (in parentheses) calculated via bootstrap.
*** p<0.01, ** p<0.05, * p<0.1

Back

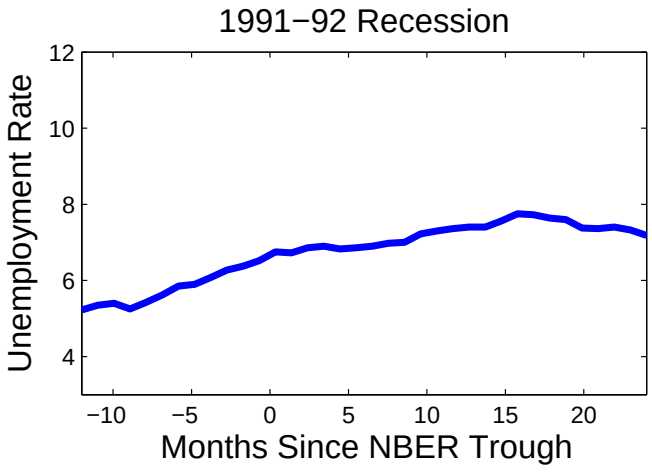
Mitman and Rabinovich (2013)

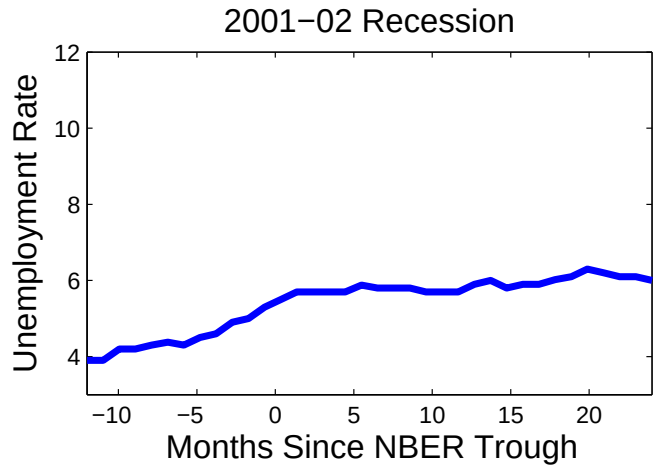
- The last three recessions in the United States were followed by jobless recoveries: while labor productivity recovered, unemployment remained persistently high
- Using the empirical estimates, we show changes in unemployment insurance policy over the last 50 years can help account for this phenomenon

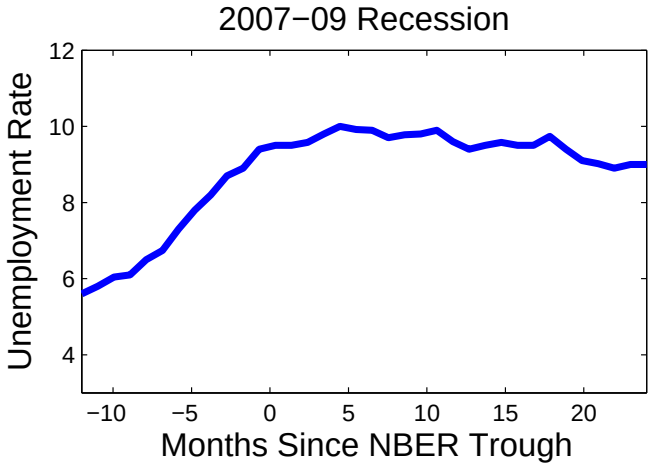
Jobless Recoveries: Illustration



Jobless Recoveries: Illustration



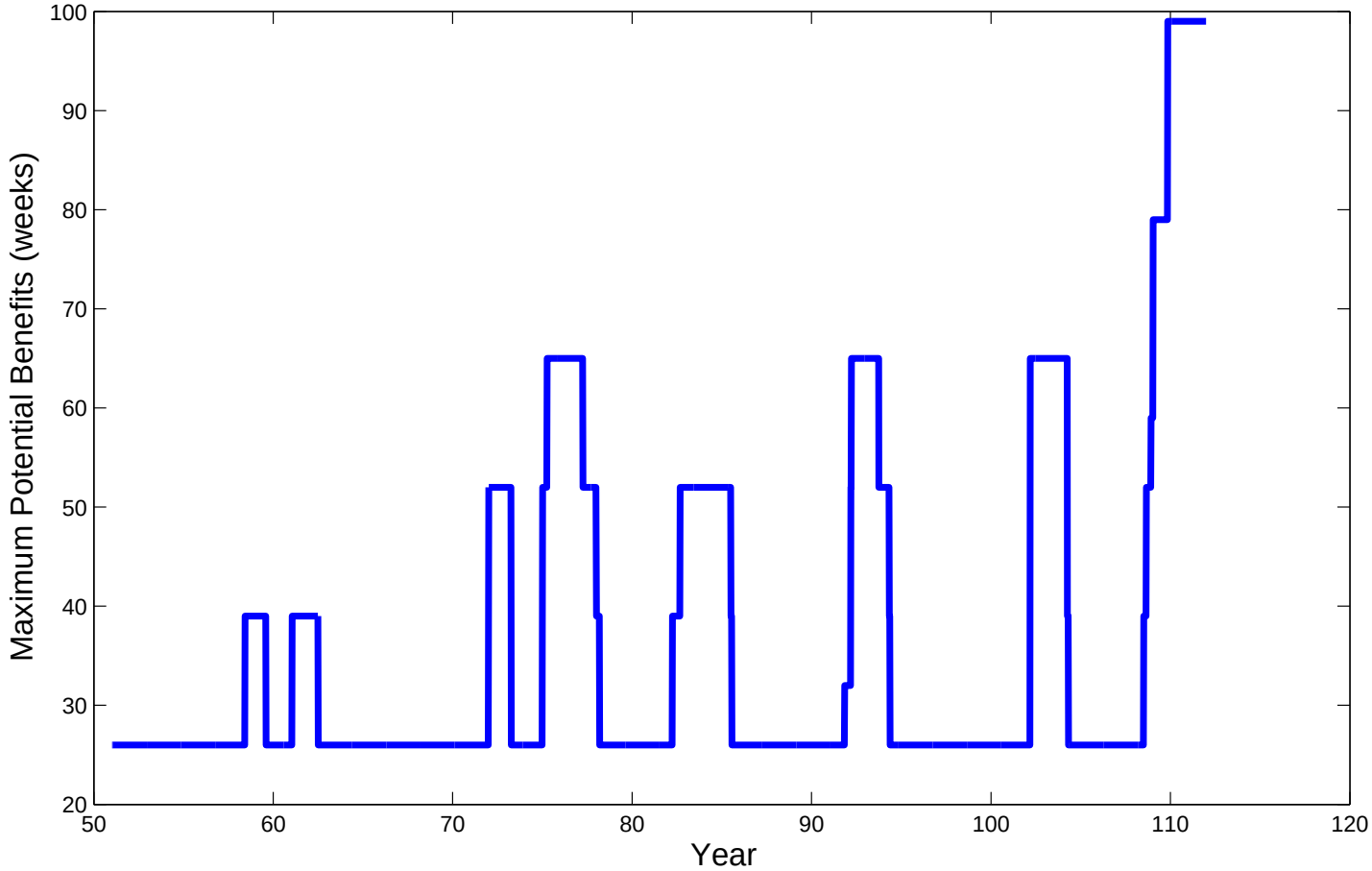




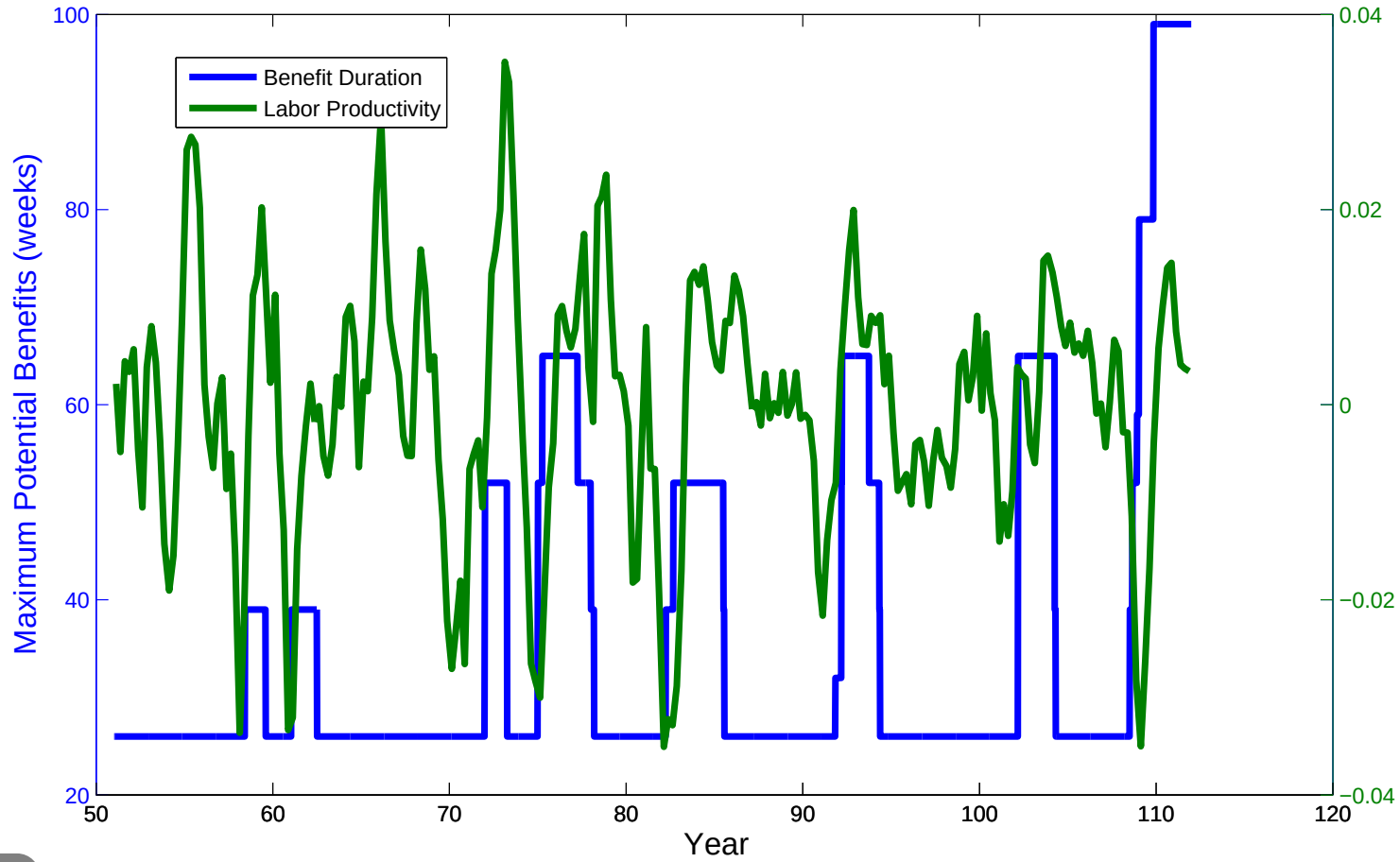
Trend in Unemployment Insurance

- Unemployment insurance generosity in the US is characterized by a level and a duration
- The duration of unemployment benefits is extended during recessions
- These extensions became progressively more generous over time, especially in relation to the drop in labor productivity during recessions

Trend in Unemployment Insurance

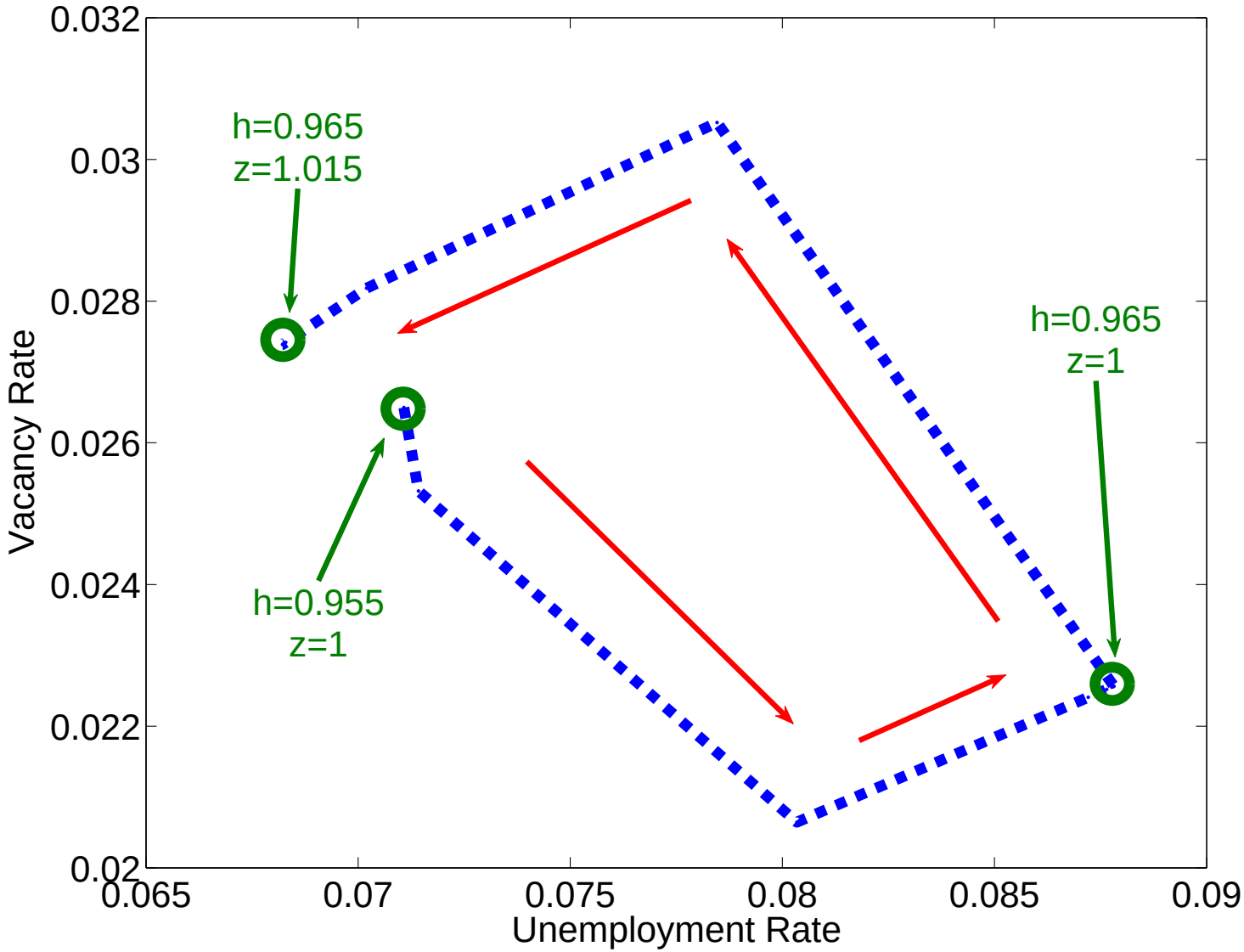


Trend in Unemployment Insurance

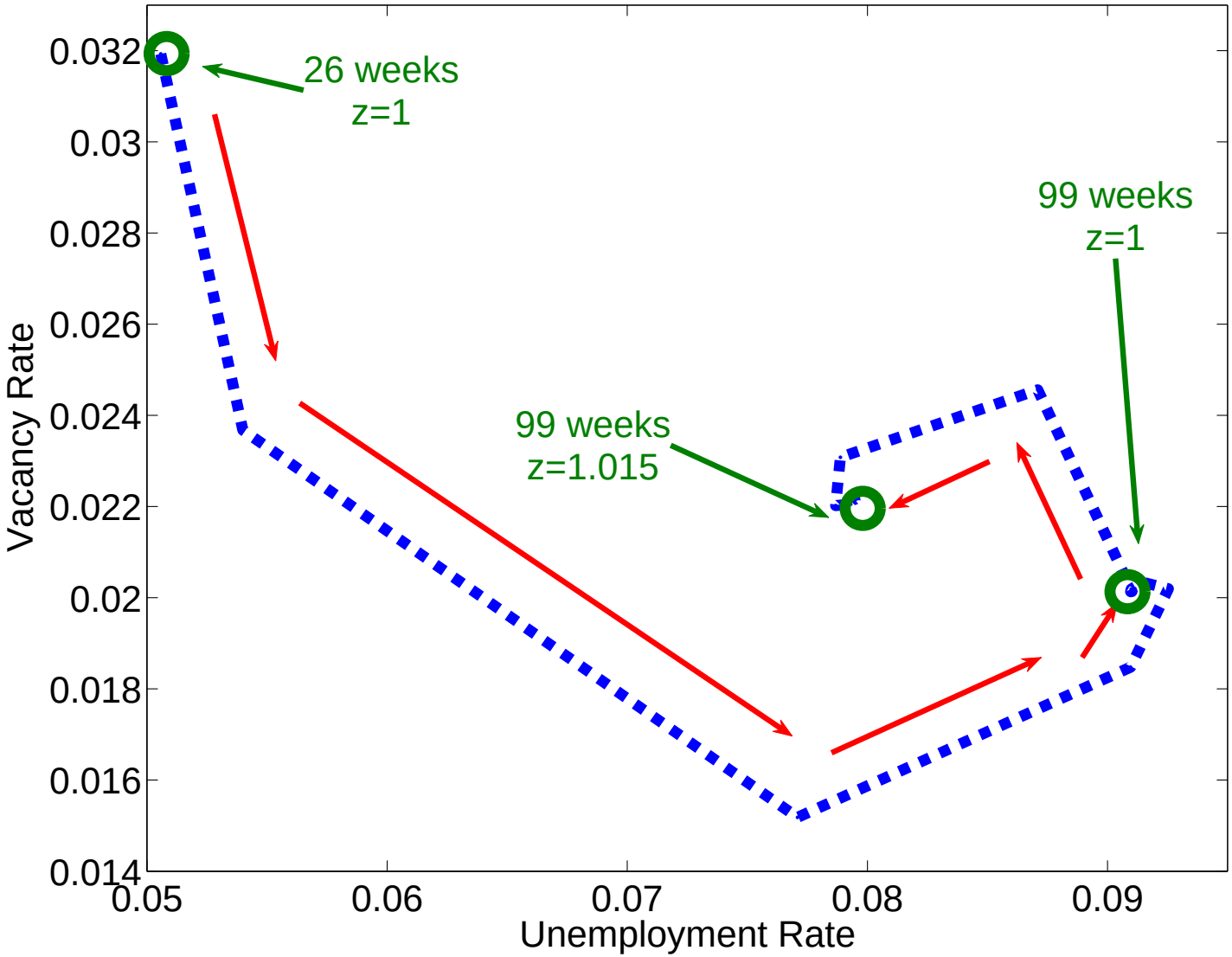


Back

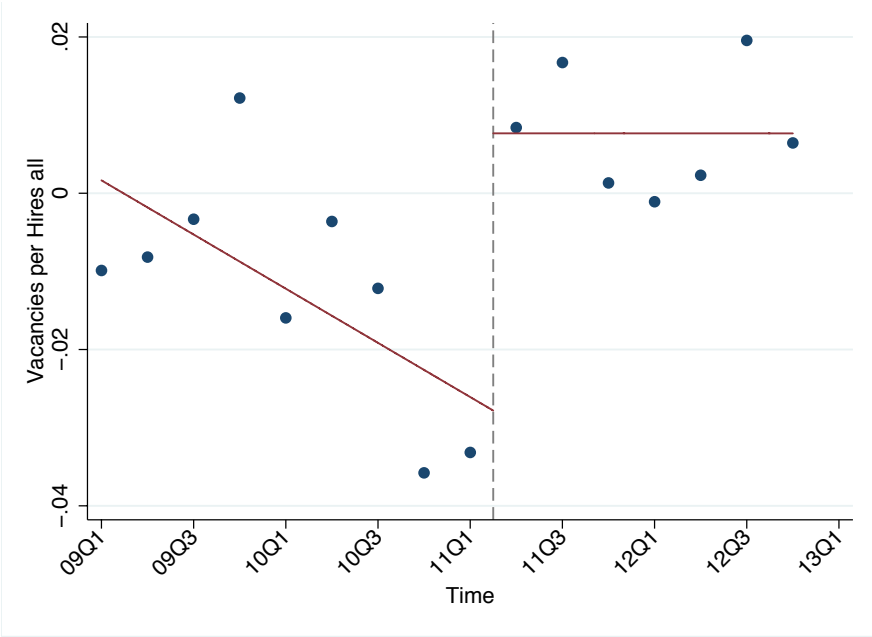
The Beveridge Curve: Changing Benefit Levels

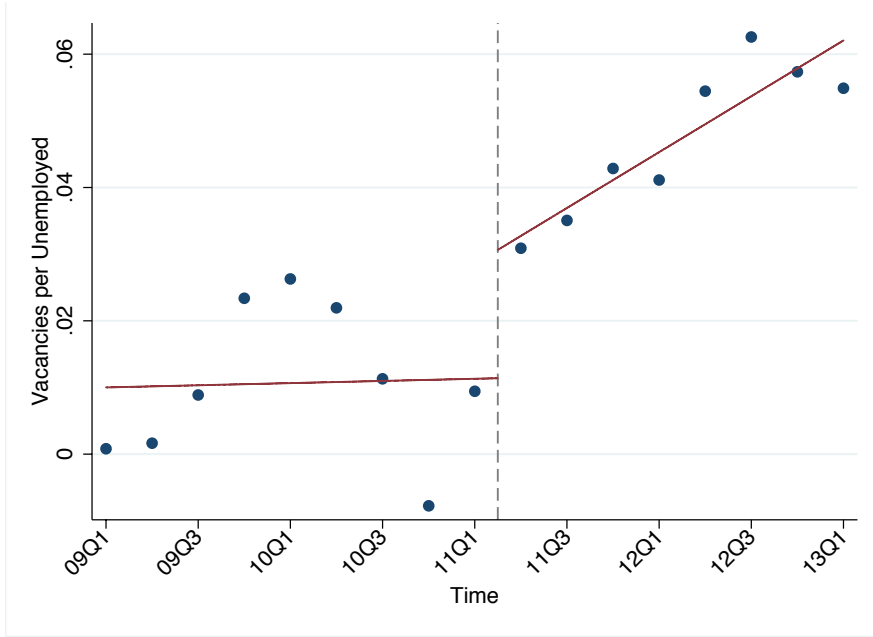


The Beveridge Curve: Benefit Extensions



A Motivating Example: Missouri





Case Study of North Carolina

- In Feb. 2013 North Carolina passed a law that violated federal UI rules and as a consequences on July 1, 2013 its residents lost all federally financed extended benefits.

- Its subsequent labor market performance might be suggestive of the relevance of the following two arguments:

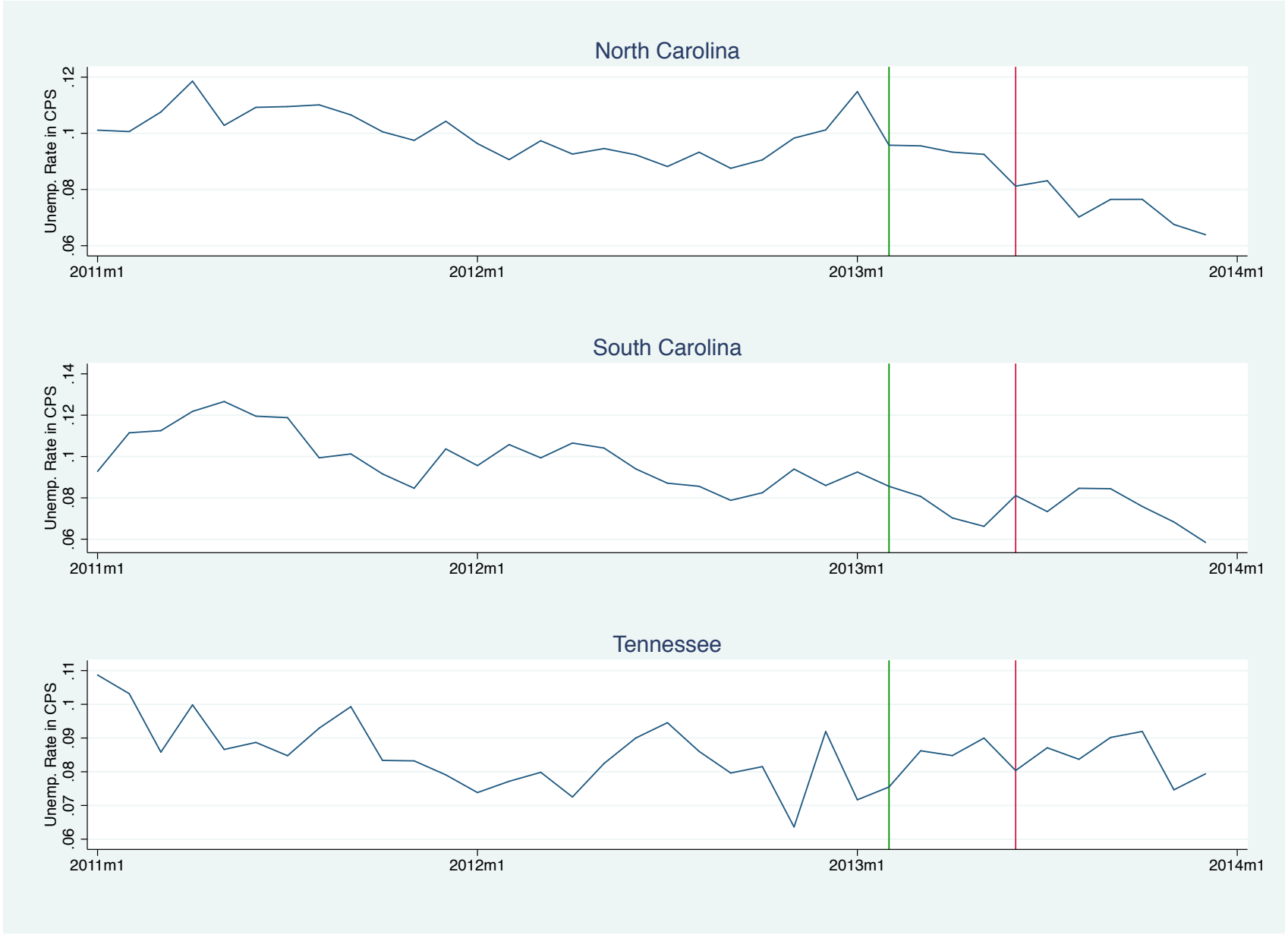
  1. The level of aggregate demand is low. Losing hundreds of millions of dollars in transfers lowers it even further and leads to lower employment.

  2. Extended benefits keep unemployed in the labor force. Eliminating extensions leads them to abandon job search.

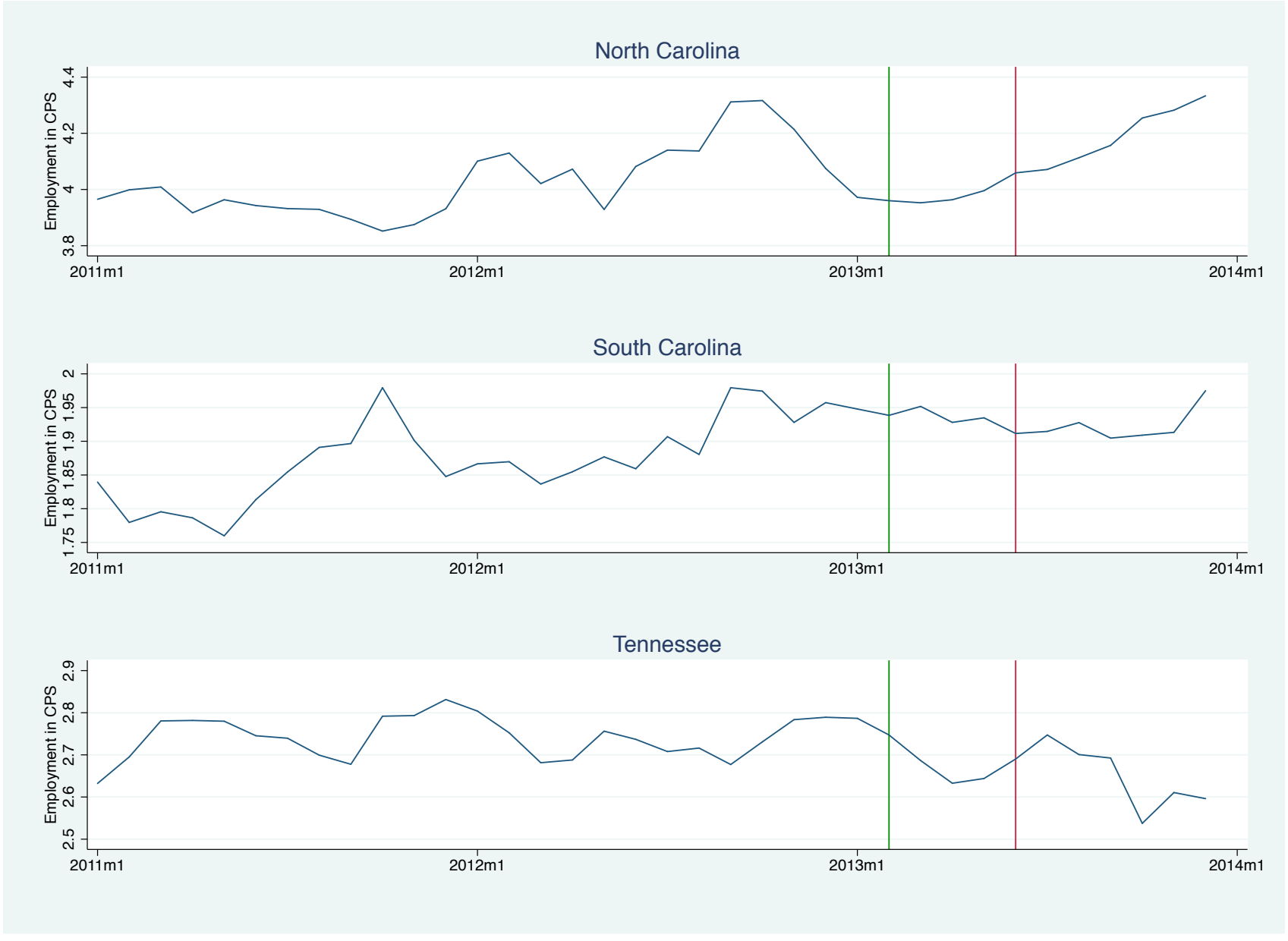
- Consider evidence in the Household Survey (CPS), the Establishment Survey (CES), and BLS LAUS data.

- The sharp observed increase in employment indicates that the effect of benefits on job creation dominates.

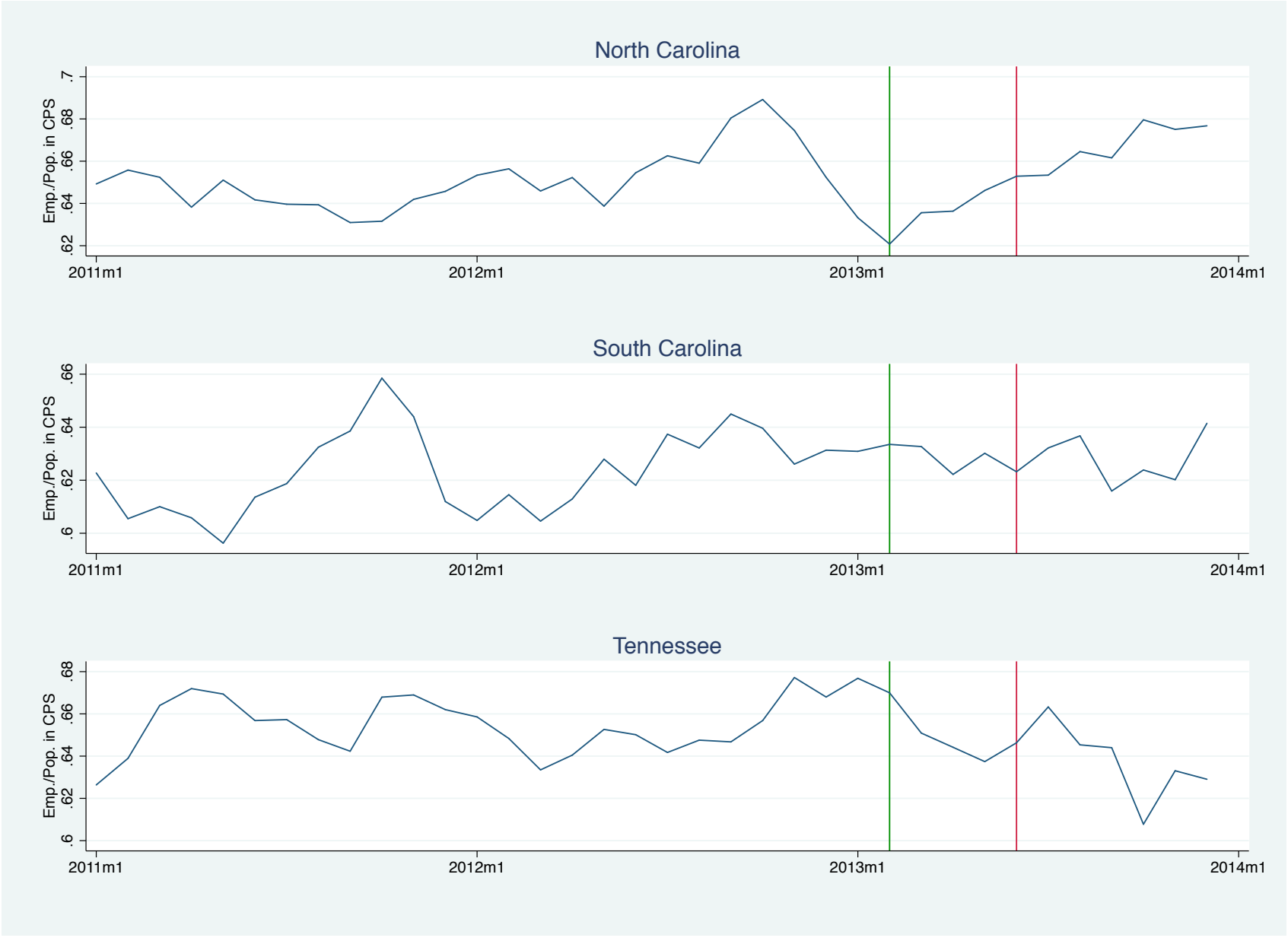
Unemployment Rate from CPS.



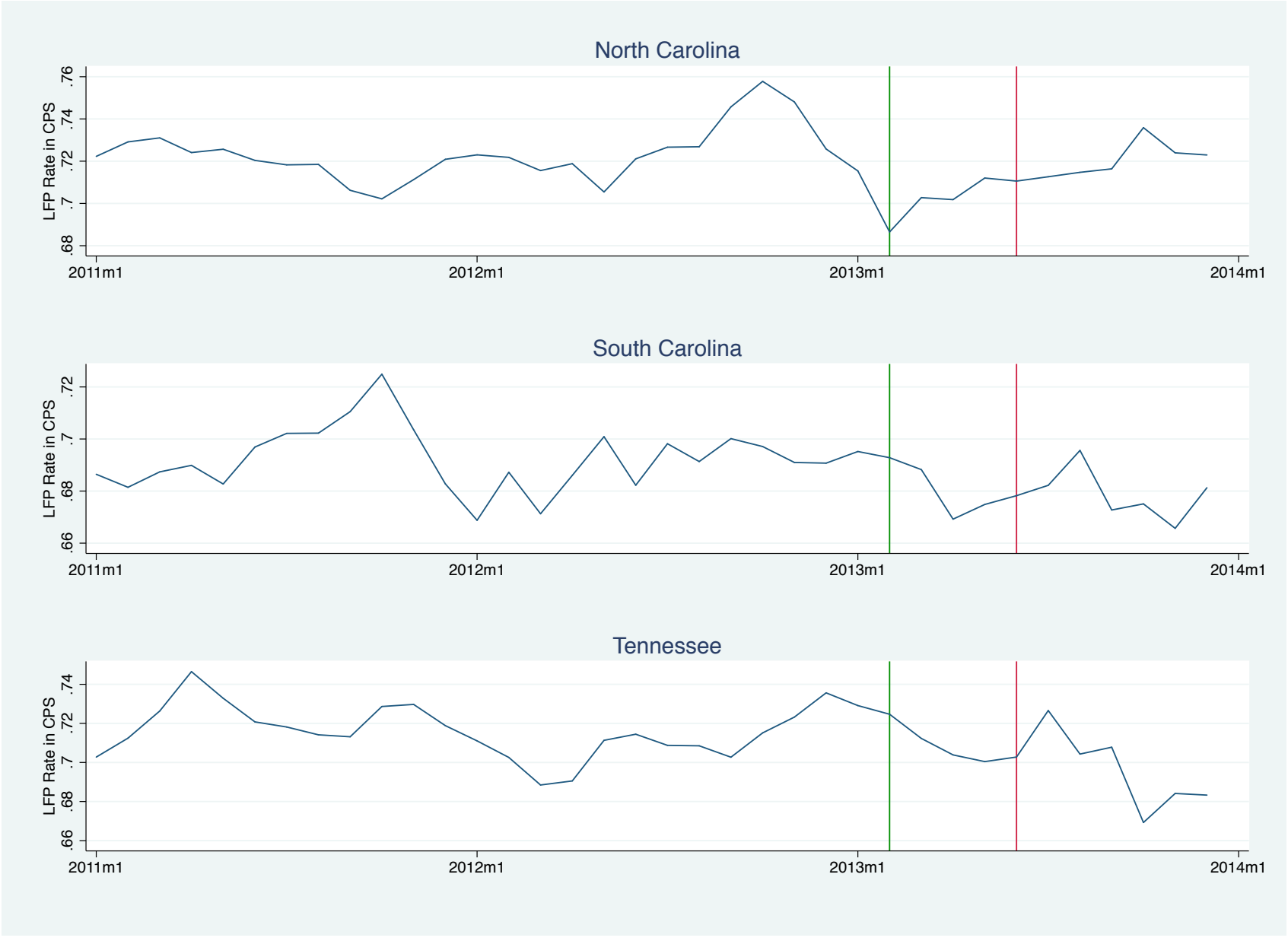
Employment from CPS.



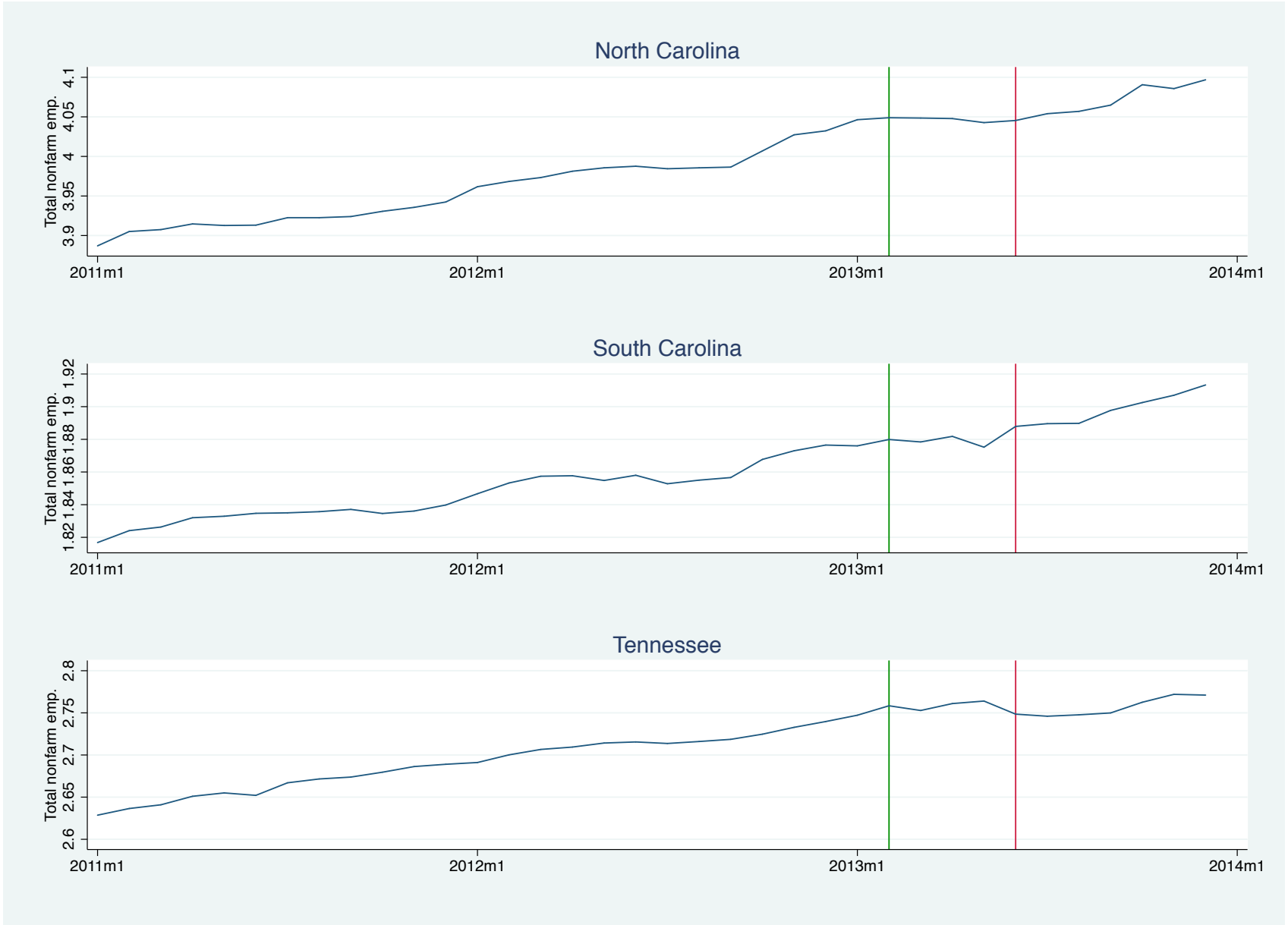
Employment to Population Ratio, CPS.



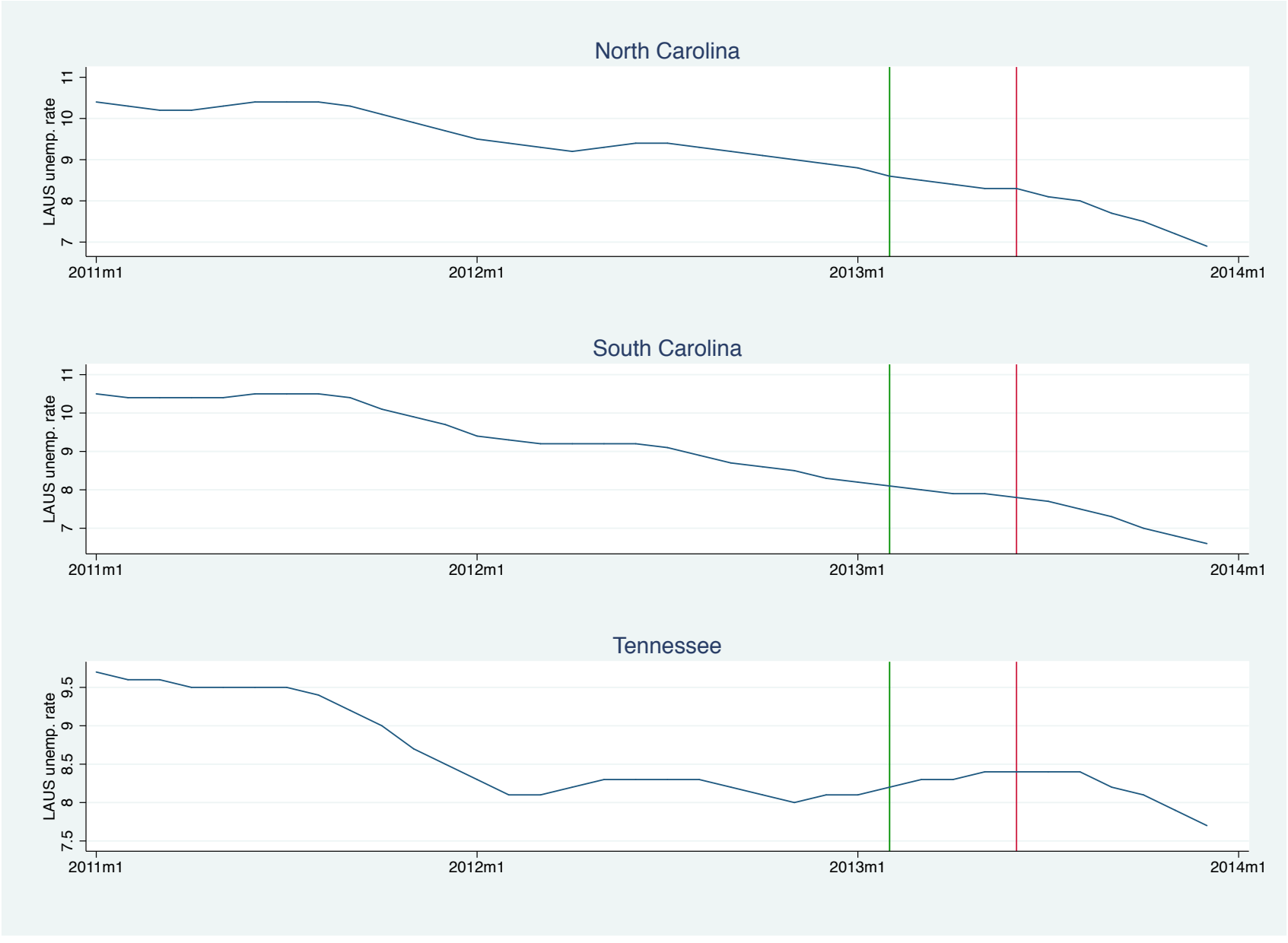
Labor Force Participation Rate, CPS.



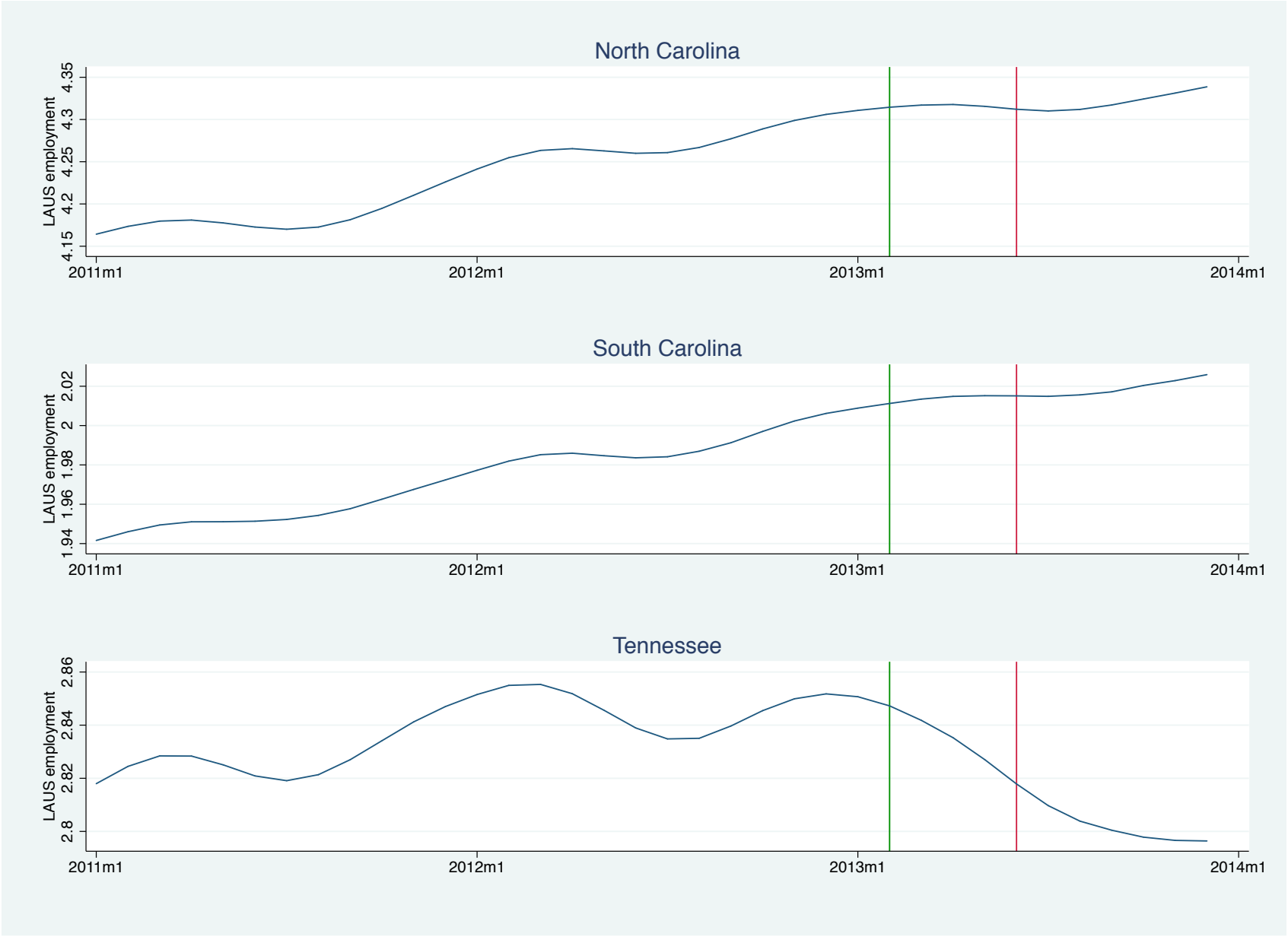
Nonfarm Payroll Employment, CES.



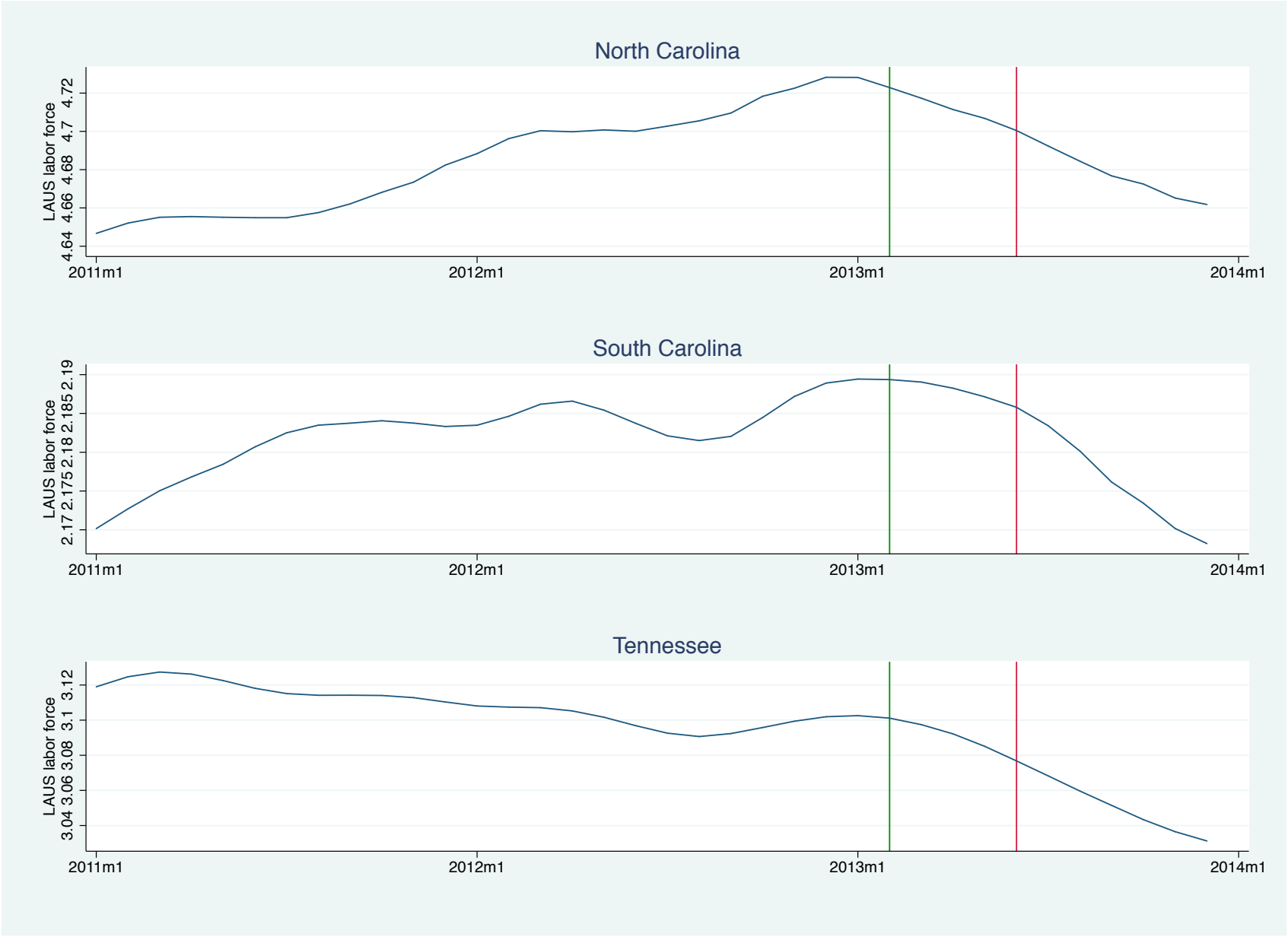
Unemp. Rate from BLS LAUS.



Employment from BLS LAUS.



Labor Force from BLS LAUS.



NC Case Study: Empirical Specification

- Basic specification:

$$\Delta_p X_t = \alpha \Delta_p b_t + \eta_p + \epsilon_{p,t},$$

  where $\Delta_p x_t = x_t^p - x_t^{NC}$, $p \in \{GA, SC, TN, VA\}$

- Cannot bring this to data, α would be biased

- The benefit reduction in NC plausibly exogenous
  - Use it as an instrument for $\Delta_p b_t$

NC Case Study: Effects of Benefits in CPS

	Unemp.	E/P Ratio	Labor Force	LF Part.
Weeks of Benefits	0.1071**	-0.0261***	-0.0408***	-0.0177***
	(0.042)	(0.007)	(0.007)	(0.006)
Observations	540	540	540	540

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

NC Case Study: Effects of Benefits in CES

	Payroll	Private Payroll
Weeks of Benefits	-0.0111***	-0.0125***
	(0.003)	(0.003)
Observations	540	540

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

NC Case Study: Effects of Benefits in LAUS

	Employment	Labor Force	Unemployment
Weeks of Benefits	-0.0177***	-0.0141***	0.0473**
	(0.003)	(0.003)	(0.022)
Observations	540	540	540

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Job Quit and Benefit Receipt

1. As a general rule, voluntary quitters are not entitled to benefits. Difficulties in establishing whether a voluntary quit has occurred, e.g., "quit by misunderstanding".

2. Even if the quit is voluntary in the sense that the employer had the job available for the worker, the quit may not be considered voluntary from the point of view of the UI laws and regulations. If employee can argue that he had a good reason for leaving the employer, he will be entitled to benefits.

3. Instead of the threat of outright quitting, the worker can implicitly threaten the employer to induce a firing. While workers fired for misconduct are not eligible for benefits, establishing misconduct is very difficult, in part due to the necessity of proving that misconduct was willful, and the burden of proof is on the employer.

Detailed legal analysis in our reply to the CEA.