

THE EFFECT OF EXTENDING UNEMPLOYMENT INSURANCE BENEFITS ON STATE UNEMPLOYMENT RATES

xxx

REHANA ABSAR, TONIA BUI, & KATHY YOUNG

The U.S. Congress established the Emergency Unemployment Compensation (EUC08) Program on June 30, 2008, to address the needs of the long-term unemployed. Conditional on a state's unemployment rate, this program provides unemployed workers up to ninety-nine weeks of unemployment benefits after exhausting their regular Unemployment Insurance (UI) benefits of twenty-six weeks. As a first step toward investigating the impacts of the ninety-nine-week UI extensions on unemployed individuals, this study evaluates whether the extension of UI benefits decreases workers' incentive to return to the labor market as determined by the unemployment rate. Using a state fixed effects model, our results demonstrate a positive relationship between the weeks of UI extensions and state unemployment rates. Our findings help inform policymakers on how to address the issue of high unemployment during times of economic downturn.

INTRODUCTION

Current long-term unemployment, which is attributed largely to the Great Recession that began in 2007, remains a significant issue in the United States.¹ The recession officially ended in June 2009, when the jobless rate stood at 10 percent. The end of 2009 saw 15.3 million unemployed persons in the labor force, while an estimated 1.4 million very long-term unemployed workers remained as of October 2010.² Among the unemployed, four in ten (6.1 million) were jobless for twenty-seven weeks or more, by far the highest proportion of long-term unemployment on record using data going back to 1948.³

- 1 Those who are considered long-term unemployed are workers who have been out of work for more than six months, or more than twenty-four weeks (NBER 2009).
- 2 Mayer, Gerald, "The Trend in Long-Term Unemployment and Characteristics of Workers Unemployed for More Than 99 Weeks," Congressional Research Service, (2010).
- 3 Bureau of Labor Statistics 2012, "Local Area Unemployment Statistics," U.S. Department of Labor, <http://data.bls.gov/cgi-bin/survey/most?la>

In response to the Great Recession, the U.S. Congress established the Emergency Unemployment Compensation (EUC08) Program on June 30, 2008, to address the needs of the long-term unemployed. This program provides unemployed workers up to ninety-nine weeks of unemployment benefits after they exhaust their regular Unemployment Insurance (UI) benefits of twenty-six weeks. The significance of the EUC08 is demonstrated by Congress' decision to extend the program eleven times — the most recent extension occurred under the American Tax Payer Relief Act of 2012, signed into law on January 1, 2013. As a first step toward investigating the impacts of the ninety-nine-week UI extensions on unemployed individuals, this study seeks to evaluate whether the extension of UI benefits decreases workers' incentive to return into the labor market as determined by state unemployment rates.

In the sections below, we will provide a background on the UI program, which includes summaries of the numerous changes Congress made to state qualifications for extensions. We also briefly discuss previous research that evaluated the effects of unemployment insurance on the unemployment rate. Next, we discuss the motivations behind our research question and our research hypotheses. We then describe the data that serves as our predictors of unemployment and the methodology used in this paper. Finally, we provide an analysis of our test results. We conclude with a discussion on how our research contributes to future studies examining the effectiveness of the UI program at the state level.

PROGRAM BACKGROUND

What is the Federal-State Unemployment Insurance Program?

The enactment of state unemployment insurance (UI) laws first occurred under the Social Security Act of 1935, which intended to provide a tax offset incentive for employers.⁴ Originally, only industrial and commercial workers in the private industry received unemployment insurance coverage under the Federal Unemployment Tax Act.⁵ However, the Employment Security Amendments of 1970 and the Unemployment Compensation Amendments of 1976 added substantially to the number and types of workers protected under the state programs.⁶

According to the Employment and Training Administration, the Federal-State Unemployment Insurance Program currently provides benefits to eligible workers when they become involuntarily unemployed.⁷ UI benefits provide temporary financial assistance to unemployed workers who meet the state law

4 Office of Retirement and Disability Policy, "Annual Statistical Supplement 2012: Unemployment Insurance Program Description and Legislative History," Social Security Administration, accessed November 12, 2012, <http://www.ssa.gov/policy/docs/statcomps/supplement/2012/unemployment.html>

5 Ibid.

6 Ibid.

7 Gabe, Thomas and Julia M. Whitaker, "Antipoverty Effects of Unemployment Insurance," *Congressional Research Service*, accessed November 14, 2012.

requirements. States determine eligibility, benefit amounts, and length of time for each UI claim. Under federal law, states must provide UI benefits, which are limited to twenty-six weeks in most states. The general UI program requires that unemployed individuals actively seek work to qualify for benefits. Workers who voluntarily quit their jobs without good cause or are discharged for misconduct are denied benefits. Although states are subject to some federal requirements, they are generally able to set their own eligibility criteria and benefit levels.

Extended Benefits (EB)

Established in 1970, the Federal-State Extended Benefits (EB) Program assists unemployed workers who exhaust their regular state UI benefits during time periods of high unemployment.⁸ States can trigger the EB depending on certain current economic conditions. In addition to the twenty-six weeks of regular unemployment benefits, the EB program allows states to qualify for an additional thirteen weeks of benefits. Some states can enact a voluntary extension program to pay up to seven additional weeks, thus offering a maximum of twenty weeks of EB.

Emergency Unemployment Compensation (EUC08)

The federal UI program has changed drastically during its seventy-five-year history. Congress made several changes to the UI program during peaks of long-term unemployment and throughout the recession that began in December 2007. In June 2008, the federal government enacted the Emergency Unemployment Compensation Program of 2008, which provides states temporary extensions in unemployment benefits for individuals who already collected both regular state benefits and extended benefits. Since that time, Congress extended the EUC08 program eleven times.⁹ This current study examines the extensions through the Middle Class Tax Relief and Job Creation Act of 2012, which was enacted on February 22, 2012.¹⁰

8 “Annual Statistical Supplement 2012: Unemployment Insurance Program Description and Legislative History.”

9 P.L. 110-252 (Supplemental Appropriations Act, 2008) signed on June 30, 2008, established the EUC08 program. The program was expanded on Nov 21, 2008 by P.L. 110-449 (Unemployment Compensation Extension Act of 2008), extended on February 17, 2009 by P.L. 111-5 (American Recovery and Reinvestment Act), further expanded on Nov 6, 2009 by P.L. 111-92 (Worker, Homeownership, and Business Assistance Act of 2009), further extended on December 19, 2009 by P.L. 111-118 (Department of Defense Appropriations Act, 2010), further extended on March 2, 2010 by P.L. 111-144 (Temporary Extension Act of 2010), further extended on April 15, 2010 P.L. 111-157 (Continuing Extension Act of 2010), and further extended on July 22, 2010 by P.L. 111-205 (Unemployment Compensation Extension Act of 2010), further extended on December 17, 2010 by P.L. 111-312 (Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010), and further extended on December 23, 2011 by P.L. 112-78 (Temporary Payroll Tax Cut Continuation Act of 2011). Most recently, on February 22, 2012, the EUC08 program was further extended by P.L. 112-96 (Middle Class Tax Relief and Job Creation Act of 2012).

10 This study does not include the most recent extension of the EUC08 program under the American Taxpayer Relief Act of 2012, Public Law 112-240, which was signed into law on January 1, 2013.

EUC08 benefits are available to individuals who experience weeks of unemployment ending on or before January 2, 2013. However, the most recent law allows EUC08 payments to last until the week ending on December 29, 2012. The Middle Class Tax Relief and Job Creation Act of 2012 also expanded EUC08 benefits to a maximum of fourteen weeks in every state and up to an additional thirty-three weeks for individuals in high-unemployment states. Therefore, the maximum number of weeks states can qualify for EUC08 is forty-seven.

Tiers for Extension Qualifications

Under the current EUC08, states that qualify for extensions are placed into tiers given their current unemployment rate. The Middle Class Tax Relief and Job Creation Act of 2012 made structural changes to the EUC08 program by making the duration and availability of EUC08 tiers dependent on the calendar date. Below is a brief description of the changes, and how the tiers determine the number of weeks in extensions that states are eligible for, as demonstrated in Table 1.

Tier I is available in all states. States in this tier are eligible for twenty-six weeks of UI benefits. Additionally, states were able to offer up to twenty weeks of additional benefits until September 2012. After September 2012, states provide a maximum of fourteen weeks of extension benefits.

Tier II is available in all states and remains eligible for the twenty-six weeks of UI benefits. Tier II states qualified for an additional fourteen weeks until June 2012 in addition to their Tier I benefits. As of June 2012, states must have had a three-month seasonally adjusted average total unemployment rate (TUR) of at least 6 percent to make Tier II benefits available in their area.

Tier III is available to states with a TUR of at least 6 percent or an uninsured unemployment rate (IUR) of at least 4 percent. Before September 2012, Tier III states qualified for an additional thirteen weeks of benefits. After September 2012, the maximum number of weeks of UI benefits available in Tier III decreased from thirteen to nine weeks.

Tier IV benefits are available in states with very high unemployment rates. However, the weeks of benefit extensions range from state to state. States in Tier IV are currently active under the EB program and have a TUR of at least 8.5 percent or an IUR of at least 5 percent for up to six weeks until June 2012. For states without an active EB program and have a TUR of at least 8.5 percent, or an IUR of at least 5 percent, the maximum potential duration is up to sixteen weeks in Tier IV. The sixteen-week provision for states without an active EB program terminated in June 2012. Since June 2012, Tier IV benefits are available in states with a TUR that is at least 9 percent, rather than 8.5 percent, or an IUR that is 5 percent, which is unchanged. Thus, for all states meeting the unemployment rate criteria, the maximum potential duration is up to six weeks. Beginning in September 2012, the maximum duration of Tier IV benefits increased to ten weeks.

Ninety-nine Weeks Explanation

A combination of the regular UI state benefits, Extended Benefits, and EUC08 benefits may allow for states to qualify for a maximum of ninety-nine weeks depending on when they trigger the tiers based on their high unemployment rate. Not all states are eligible for the maximum number of weeks due to variations in state unemployment rates. States began qualifying for the ninety-nine-week extensions in the fourth quarter of 2009.

TABLE 1: WEEKS OF UNEMPLOYMENT INSURANCE BENEFITS AVAILABLE TO UNEMPLOYED WORKERS

	<i>Base</i>	<i>EB</i>	<i>EUC08</i>				<i>Max No. of Weeks</i>
			<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>T4</i>	
Q1 2005– Q2 2008	26	13	x	x	x	x	39
Q3 2008	26	13	13	x	x	x	52
Q4 2008– Q3 2009	26	13 or 20	20	13	x	x	79
Q4 2009– Q2 2012	26	13 or 20	20	14	13	6*	99
Q3 2012	26	20	14	14	9	10	93

*In Q1 2012 a few states were eligible for 16 weeks of T4 benefits.

MOTIVATION OF RESEARCH

Our evaluation on the effects of UI benefit extensions is crucial because the changes made to the UI program are fairly recent. It is important to consider short-term impacts of UI extensions on state unemployment rates so that state and federal policymakers can make more informed decisions regarding unemployment benefits in the future. The central question remains: will funding or lack of funding for UI programs and benefits for the unemployed reduce unemployment? Further, the current study contributes to the small literature that explores worker incentives among UI beneficiaries in the United States after the most recent recession.

Theoretically, unemployment insurance makes up for a loss of financial resources. Unemployment benefits help to reduce poverty for many families.¹¹ UI compensates for lost wages during the time an individual is unemployed.¹² UI benefits can also serve as a financial supplement for individuals without savings.¹³ Some scholars perceive UI benefits as a safety net for when one earns no income

11 “Antipoverty Effects of Unemployment Insurance.”

12 Nicholson, Walter and Karen Needels, “Unemployment Insurance: Strengthening the Relationship between Theory and Policy,” *Journal of Economic Perspectives* 20, no. 3 (2006): 47–70.

13 Ibid.

due to unemployment. For these reasons, the motivation for this research is to explore the impact of UI week extensions on state unemployment rates, which serves as a proxy for worker incentive.

LITERATURE REVIEW

Previous studies use various approaches to examine the effect of the duration of unemployment benefits on employment both within and outside of the United States. General consensus on job search theory states that higher UI benefits have a negative effect on the unemployment rate, which is largely attributed to the moral hazard effect.¹⁴ Moral hazard occurs as job-search efforts are reduced when unemployment benefits are higher; in this state, individuals are more willing to take risks knowing others take on the costs. Most past studies focused on the policy effect of using individual micro-data.

Meyer (1990) investigated the effect of level and length of unemployment insurance benefits on unemployment durations. He found higher UI benefits to have a strong negative effect on the probability of leaving unemployment.¹⁵ However, right before benefits expired, the probability of leaving unemployment increases significantly. This study stemmed from an earlier study, which found a 10 percent increase in UI benefits increased unemployment periods by approximately 0.5 weeks and a one-week extension of benefits increased the duration of unemployment by 0.15 weeks.¹⁶

A more recent study examined the policy effect of extended unemployment benefits in Austria, looking specifically at the equilibrium of unemployment or labor market flows.¹⁷ The study found that increasing unemployment benefits was associated with a significant increase in the unemployment rate, specifically due to the increase in inflow from unemployment rather than the outflow. In looking at the effect of unemployment benefits on unemployment, one study found that job seekers became more selective as a result of extended benefits, which contributed to longer and higher unemployment rates.¹⁸

A common limitation mentioned in studies that explore the state of labor conditions during economic recessions is endogeneity where benefits are often extended during times of economic downturn when unemployment is high.¹⁹

14 Kroft, Kory and Matthew J. Notowidigdo, "Should Unemployment Insurance Vary With the Unemployment Rate? Theory and Evidence," *National Bureau of Economic Research* (2011), accessed November 12, 2012.

15 Meyer, Bruce, "Unemployment Insurance and Unemployment Spells," *Econometrica* 58 (1990), 757–782.

16 Moffitt, Robert, "Unemployment Insurance and Unemployment Spells," *Journal of Econometrics* 28(1985): 85–101.

17 Lalive, Rafael, Jan C. van Ours, Josef Zweimüller, "Equilibrium Unemployment and the Duration of Unemployment Benefits," *Journal of Population Economics* 24(2011): 1385–1409.

18 Beranek, William and David Kamerschen, "Unemployment Benefits and Unemployment," *Modern Economy* 2(2011): 800–803.

19 Kroft and Notowidigdo, "Should Unemployment Insurance Vary with the Unemployment Rate? Theory and Evidence."

Based on these studies mentioned above, the hypothesis tested in the current study is that extending UI benefits is positively associated with unemployment.

DATA

Panel data at the state level is used in this analysis. To assess the impact of the Extended Benefits Program and the Emergency Unemployment Compensation Program implemented during the most recent U.S. recession, data are used from the first quarter of 2005 through the third quarter of 2012. Quarterly data are assessed at the end of March, June, September, and December.

Given the focus of this analysis and time period of interest, the unit of analysis is state-year-quarter. Due to benefit eligibility differing between states, state-level, instead of national-level, data is used. To capture changes over time, data is included at each quarter because annual data fails to provide enough detail to capture the policy effect. Thus, data is included for four periods each year of each state. Therefore, the total number of observations in the estimation sample is 1,550.²⁰

VARIABLES

Dependent Variable: Unemployment Rate

The outcome variable is a state's seasonally adjusted unemployment rate in a given quarter, collected from the Bureau of Labor Statistics (BLS).²¹ Seasonally adjusted rates provide a more constant pattern over the course of a year and allow us to observe non-seasonal trends. It is measured by the total number of workers who are unemployed, divided by the total labor force in the market. For the years included in this analysis, state unemployment rates range from 2.3 percent to 14.1 percent with an average rate of 6.4 percent.

Independent Variable: Weeks of Unemployment Benefits

The independent variable of interest is the maximum number of weeks of unemployment benefits in a state for a given quarter. As previously discussed, different programs yield the maximum weeks available in a given quarter for each state. The number of UI benefits weeks available to a state is contingent on the unemployment rate in the previous quarter. The number of weeks of unemployment available ranges from twenty-six weeks to ninety-nine weeks during the time period included in this analysis. Ninety-nine weeks of benefits is triggered when, in addition to the base level of 26 weeks, a state is eligible for the

20 50 states * 8 years * 4 quarters per year – 50 (data for the last quarter of 2012 was unavailable at the time of the study)

21 The formula for the BLS unemployment rate excludes unemployed workers who dropped out of the labor force and who are not actively searching for work. For more information on BLS' method to calculate the unemployment rate, see Local Area Unemployment Statistics FAQ: <http://www.bls.gov/lau/laufaq.htm#Q03>

maximum number of weeks of extended benefits and emergency unemployment compensation. On average, the number of unemployment insurance weeks available in a given quarter is fifty-three weeks, as shown in Table 2.

To calculate the total number of weeks of benefits in a given state for each quarter, the state's eligibility for each benefit program is recorded for the regular UI program, EB program, and the EUC08 program. The U.S. Department of Labor's Employment and Training Administration releases a weekly report that details each state's eligibility for unemployment benefit programs, provides this information.

CONTROLS

Industry: The percentages of workers in each of three industries—financial services, manufacturing, and construction—are included as controls in this study. The industries were chosen because the recent recession particularly affected them.²² Consequently, employment in states with a higher percentage of construction, financial services, and manufacturing jobs are assumed to have felt more impact from the recession.

To calculate these three control variables, the number of jobs in each industry for each state and quarter is divided by the total employment in that state and quarter. The data on the number of jobs in each industry are available from the BLS Employment, Hours, and Earning State and Metro Area monthly report. This report provides the number of seasonally adjusted construction, financial services, and manufacturing jobs, in thousands, for each state. However, in a few states, construction rate data is combined with the mining and logging industry because of an insufficient sample of construction jobs. Given construction jobs could not be disaggregated from the other industries, no data on construction jobs are included for six states.²³ The issue of missing data also arises in the manufacturing rate data.²⁴

Governor Political Affiliation: Governor political affiliation is controlled for as a binary variable. Literature shows that the political affiliation of a state governor could affect the type of spending policies, the amount of taxes imposed on constituents, and the actions taken to respond to the conditions of the state economy.²⁵ The data is retrieved from the National Governors Association's database of former governors' biographies, which lists the year terms and the political party of previous and current governors. Of the collected data, the observations are equally divided with 775 Republican governors and 775 non-Republican governors.

22 Jamiovič, Nir and Henry E. Sui, "The Trend is the Cycle: Job Polarization and Jobless Recoveries," *National Bureau of Economic Research*, accessed November 14, 2012, <http://www.nber.org/papers/w18334>.

23 The states missing data on construction jobs are Delaware, Hawaii, Maryland, Nebraska, South Dakota, and Tennessee. This results in missing data on construction for 186 observations.

24 Hawaii was missing data for years 2005 and 2006, while Alabama was missing data entirely. As a result, thirty-nine observations are missing for the manufacturing industry.

25 Oded Izraeli and Sherman Folland, "State Income, Employment, Infrastructure and Well-being: Do Party Control and Political Competition Matter?" *Social Science Research Network*, accessed November 14, 2012, <http://ssrn.com/>

Race: Race is included in this analysis to account for variation between states. Recent reports show that African Americans have higher unemployment rates compared to non-Hispanic Whites during the recent economic recession.²⁶ In this study, the race variables are non-categorical and are measured as the percentage of Black or African American and White populations within every state for each year. This is calculated by dividing the number of Blacks and the number of Whites by the total state population. Data are included for years 2005 to 2011. Data for 2012 is unavailable, thus 150 observations are missing. Race data are collected from the US Census Bureaus through the American Community Survey (ACS).

State Gross Domestic Product (GDP): State GDP is important given that it impacts the growth of the state economy. Based on macroeconomic theory, private-sector industries hurt by the recession most likely reduce their productivity and outputs of goods during the recession. A decrease in state productivity would in turn affect the number of jobs available in the labor market. Economic trends from the Great Recession show that a reduction of GDP contributes to fewer payrolls within the private sector (CBPP 2012). Therefore, unemployment is linked to GDP. In this study, state GDP is measured as a percentage of the national GDP. Data from the Bureau of Economic Analysis provide the total state GDP, which is divided by the total U.S. GDP to calculate the percentage of state GDP.²⁷ Data for 2012 was unavailable, limiting the number of observations to 1,400.

Median Income: State median income by year serves as another control variable. Median income is important because it directly impacts an individual's incentive to work. Moreover, income level is a factor used for states to determine workers' eligibility for the UI program. The median income variable is measured in thousands of dollars as a nominal value. This analysis includes the individual median income of workers for each state in the past twelve months of the given year.

This data is gathered from the ACS for the years 2005 through 2011. ACS data for 2012 was unavailable, resulting in 150 missing quarters of data. The ACS includes the population of workers who are fifteen years and over with income in the past twelve months during the given year. American Fact Finder served as the source for this data.

26 Nichols, Austin and Margaret Simms, "Racial and Ethnic Differences in Receipt of Unemployment Insurance Benefits During the Great Recession," *The Urban Institute* (2012).

27 GDP percentages were not adjusted for inflation.

TABLE 2: DESCRIPTIVE STATISTICS

<i>Variable</i>	<i>Observation (N)</i>	<i>Mean</i>	<i>S.D.</i>	<i>Minimum</i>	<i>Maximum</i>
Weeks	1,550	52.7	28.1	26.0	99.0
Unemployment Rate (%)	1,550	6.4	2.4	2.3	14.1
Construction Rate (%)	1,364	4.8	1.4	2.8	12.0
Financial Services Rate (%)	1,550	5.4	1.3	3.5	10.9
Manufacturing Rate (%)	1,511	9.0	3.5	2.1	19.0
Republican Governor	1,550	0.50	0.50	0.0	1.0
African American (%)	1,400	10.2	9.5	0.3	37.5
White (%)	1,400	78.5	12.6	24.6	96.6
State GDP (%)	1,400	2.0	2.4	0.2	13.5
Median Income (\$)	1,400	25477	3369	18479	35593

METHODOLOGY

This section provides an overview of the methods used to test the hypothesis that UI benefit extensions affect state unemployment rates. An empirical model was developed to represent the dependent, independent, and control variables. This basic model helps further analyze the impacts of UI extensions on state unemployment rates.

BASIC EMPIRICAL MODEL

$$unemp_{syq} = \beta_0 + \beta_1 weeks_{syq-1} + \beta_2 constr_rate_{syq} + \beta_3 fin_rate_{syq} + \beta_4 manuf_rate_{syq} + \beta_5 repubgov_{syq} + \beta_6 afri_am_{syq} + \beta_7 white_{syq} + \beta_8 st_gdp_{syq} + \beta_9 med_income_{syq} + \beta_{10} year_{syq} + a_s + \tau_{syq} + \mu_{syq}$$

unemp_{syq} = Unemployment rate for each state-year-quarter

weeks_{syq-1} = Maximum number of weeks of UI in the previous quarter for each state

constr_rate_{syq} = Construction rate for each state-year-quarter

fin_rate_{syq} = Financial service rate for each state-year-quarter

manuf_rate_{syq} = Manufacturing rate for each state-year-quarter

repubgov_{syq} = Political party of governor for each state-year-quarter

afri_am_{syq} = Percentage of African-Americans in each state-year-quarter

white_{syq} = Percentage of Whites in each state-year-quarter

st_gdp_{syq} = GDP rate for each state-year-quarter

med_income_{syq} = Median income for each state-year-quarter

$year_{syq}$ = Year dummies for 2005-2012

a_s = Unobserved error for time invariant state (fixed) effects for each state

τ_{yq} = Unobserved error for each year-quarter

μ_{syq} = Unobserved state-year-quarter error

MODEL OVERVIEW

Several models are used to explore the effect of the number of weeks of UI benefits on the unemployment rate for each state. In all models, the unemployment rate is the dependent variable and the independent variable of interest is weeks of unemployment benefits. To address the problem of endogeneity, the number of weeks of benefits is included as a lagged variable based on the number of weeks available in the previous quarter. All of the models include year dummies for 2005 through 2011; due to missing data for some of the variables in 2012, this year is dropped from the models. The year 2005 is used as the reference group.

Control variables are included based on theory and previous research. The controls include the percentage of workers in three industries: financial services, manufacturing, and construction. The percentages of Whites and Blacks in the state's population are included, as well as state median income and the political affiliation of the governor of each state. Data for some states are not available for two of the controls included in the model, construction and manufacturing. This causes seven states to drop out of the model leaving only forty-three state clusters. To include all states in the analysis, the models are run twice, once with all the controls and once with these two controls removed. The models that include all fifty states in the sample size are preferred because of increased statistical power and precision.

SPECIFIC MODELS

To begin, an ordinary least squares (OLS) regression is conducted to test whether UI benefits are positively associated with the unemployment rate. In addition, robust standard errors are used so inferences are robust to both heteroskedasticity and serial correlation. Even using robust standard errors, the results from the OLS regression are likely biased because of omitted variables that are correlated with the number of weeks of unemployment and the unemployment rate. To address omitted variable bias, state-level fixed effects are added to the model. State-level fixed effects are included to control for time invariant heterogeneity within states. Random effects models are also conducted to see if variation between states that are uncorrelated with weeks of UI benefits influence state unemployment rates. To control for state-year interactions, an additional fixed effects model is performed to capture time-invariant state-year time effects.

RESULTS

PREFERRED MODEL: STATE FIXED EFFECTS WITHOUT CONSTRUCTION AND MANUFACTURING RATES

We chose the state fixed effects model that excludes two of our industry variables as our preferred model to increase statistical power using data from all fifty states. Additionally, we performed a random effects test by excluding the mentioned industries. To confirm our preference, we conduct a Hausman test between random effects and state fixed effect model. The Hausman test yielded statistically significant results, which led us to select the state fixed effects model as our preferred model.

This model yielded strongly significant results for our primary independent variable, the extension of UI benefits. We found that a ten-week UI extension in the previous quarter increased the state unemployment rate on average by 0.34 percentage points, holding all other independent variables in the model constant. Substantially, the findings suggest that the extension of benefits increase the state unemployment rate to some extent. These results were statistically significant at p-level 0.01 (Column 3 in Table 3). We also found that 88 percent of the variation within each state of a given quarter is explained by our model. These results align with the literature findings that UI benefits are positively correlated with state unemployment rates, suggesting that state unemployment rates increase as UI benefits are further extended.

Our preferred model also yielded statistically significant results for several control variables. In contrast to our assumption, the financial services industry was negatively correlated with state unemployment rate. A 1 percentage point increase in financial services was associated with an average decrease of 1.5 percentage points in the state unemployment rate. A 1 percentage point increase of the rate in Whites was associated, on average, with a 0.13 percentage points increase in the state unemployment rate. The percentage of Blacks within a state did not yield statistically significant results. A 1 percentage point increase in the state GDP variable was associated with an average decrease of approximately 2 percentage points in the state unemployment rate. The median income variable was strongly statistically significant at zero, which suggests it had no effect on the unemployment rate.

The state-year fixed effects model (Column 5) yielded similar results. We found that a ten-week UI extension increased the state unemployment on average by 0.26 percentage points in a given year, holding all other independent variables in the model constant. Estimates from both models suggested that the UI-benefit extensions do increase the state unemployment rates. Overall, these results support the hypothesis that the extension of UI benefits positively affects state unemployment rates, therefore implying a reduced work incentive among the unemployed. In general, our estimates for the other models in the study yielded similar results, demonstrating a positive relationship between the weeks of UI

extensions on state unemployment rates of the current quarter in a given year. The estimates from the other models are found in Table 3 and the Appendix.

TABLE 3: EMPIRICAL FINDINGS¹

<i>Variables</i>	<i>State FE w/ all controls</i>	<i>State RE w/ all controls</i>	<i>State FE w/o all controls</i>	<i>State RE w/o all controls</i>	<i>State-Year FE w/o all controls</i>
Lagged UI Weeks	0.025 (0.004)***	0.029 (0.003)***	0.034 (0.004)***	0.043 (0.004)***	0.026 (0.002)***
Construction Rate (%)	-0.883 (0.090)***	-0.872 (0.067)***	-	-	-
Financial Services Rate (%)	-0.391 (0.391)	-0.230 (0.205)	-1.529 (0.610)**	-0.361 (0.219)*	-0.980 (0.579)*
Manufacturing Rate (%)	-0.508 (0.153)***	-0.230 (0.067)***	-	-	-
Republican Governor	-0.052 (0.113)	-0.038 (0.114)	0.016 (0.123)	-0.059 (0.127)	-
African-Americans (%)	-0.094 (0.302)	0.053 (0.029)*	0.169 (0.248)	0.041 (0.018)**	-
Whites (%)	0.080 (0.060)	0.000 (0.027)	0.127 (0.064)*	0.000 (0.013)	-
State GDP (%)	-1.199 (0.705)*	0.041 (0.088)	-1.986 (0.644)***	0.160 (0.063)**	-
Median Income	-0.000 (0.000)*	-0.000 (0.000)***	-0.000 (0.000)***	-0.000 (0.000)***	-
2005	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-
2006	-0.117 (0.191)	-0.057 (0.141)	0.367 (0.257)	0.062 (0.155)	-
2007	-0.517 (0.173)***	-0.454 (0.105)***	-0.249 (0.161)	-0.342 (0.115)***	-
2008	0.113 (0.192)	0.365 (0.143)**	0.913 (0.223)***	0.856 (0.186)***	-
2009	1.237 (0.271)***	1.536 (0.184)***	2.555 (0.240)***	2.291 (0.267)***	-
2010	0.577 (0.315)*	0.772 (0.189)***	1.874 (0.307)***	1.462 (0.316)***	-
2011	-0.125 (0.309)	0.035 (0.172)	1.185 (0.334)***	0.740 (0.305)**	-
Constant	15.495 (5.920)**	14.859 (2.339)***	11.926 (7.483)	9.692 (2.504)***	10.443 (3.140)***

<i>Variables</i>	<i>State FE ω/ all controls</i>	<i>State RE ω/ all controls</i>	<i>State FE ω/o all controls</i>	<i>State RE ω/o all controls</i>	<i>State-Year FE ω/o all controls</i>
Observations	1,161	1,161	1,350	1,350	1,350
R-squared	0.922		0.884		0.151
r2_w	0.922	0.917	0.884	0.867	0.151
N_clust	43	43	50	50	50
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 ¹ A quadratic model and log model were also performed to test our hypothesis. Estimates can be found in the Appendix.					

CONCLUSION

Understanding the effects of UI extensions on state unemployment rates is crucial for policymakers as they strive to make policies that respond to the changing economic conditions. More research is required to better identify the impacts of extending UI benefits. Although the results of the current study support the hypothesis that the extension of UI benefits is positively correlated with state unemployment rates, this study does not fully capture the impacts of the UI program and does not take into account the most recent enactment of UI extensions. Several limitations likely affect the findings on UI benefits on state unemployment rates.

Specifically, future research could precisely model the weekly unemployment extensions mechanism that differs at various quarters for each state in a given year. The current explanatory variable mechanism for UI weeks does not fully address the endogeneity problem associated with the state unemployment rate. Given that UI extensions are dependent on the states' previous unemployment rate, a refined mechanism for UI extensions would help control for endogeneity. In addition, a more precisely estimated model would take into account the different state triggers for Extended Benefits and Emergency Unemployment Compensation benefits at different cut-off points based on the year or quarter. Both steps would allow for the use of a regression discontinuity research design in future analysis.

We acknowledge constraints throughout our process of data gathering that limit the results of this analysis. This study lacked thorough state-level data that could strengthen the empirical models used to test the research hypothesis. We could not fully obtain data for the control variables due to unavailable year-quarter data. In addition, we did not control for the missing data of various occupational industries. Therefore, more state-level data for a given quarter would enhance statistical validity of our estimates.

Additional research is needed due to the changing nature of the UI program. This study only evaluates the impacts of the UI extensions up until September 2012 based on the availability of unemployment data at the time of the analysis.

Furthermore, we could not assess the full effects of the program because of the continuing extension of UI benefits. As a result, future research should be conducted once the EUC08 benefits program is terminated. Although limited, the analysis provided in this current study is timely given that Congress extended the EUC08 program eleven times. This study, which demonstrates a positive association between UI extensions and unemployment rates, can serve as a framework for future studies exploring the varying extensions of the UI program. Further analysis would provide policymakers with a deeper understanding of the impacts of UI extensions on state unemployment rates.

BIBLIOGRAPHY

- Beranek, William and David Kamerschen. "Unemployment Benefits and Unemployment." *Modern Economy* 2, no. 5 (2011): 800–803.
- Center on Budget and Policy Priorities, "Chart Book: The Legacy of the Great Recession." Accessed December 3, 2012. <http://www.cbpp.org/cms/index.cfm?fa=view&id=3252>
- Center on Budget and Policy Priorities, "Policy Basics: How Many Weeks of Unemployment Compensation Are Available?" Accessed Nov 11, 2012. http://www.cbpp.org/files/PolicyBasics_UI_Weeks.pdf
- Elmendorf, Douglas W. *Policies for Increasing Economic Growth and Employment in 2012 and 2013: Testimony before the U.S. Senate Committee on the Budget, Nov 15*. Washington, DC: Congressional Budget Office, 2011.
- Employment & Training Administration, U.S. Department of Labor, "Unemployment Insurance Extended Benefits." Accessed Nov 11, 2012. <http://workforsecurity.doleta.gov/unemploy/extenben.asp>
- Employment & Training Administration, U.S. Department of Labor, "State Unemployment Insurance Benefits." Accessed Nov 11, 2012. <http://workforsecurity.doleta.gov/unemploy/uifactsheet.asp>
- Gabe, Thomas, and Julia M. Whitaker. *Antipoverty Effects of Unemployment Insurance*. Washington, DC: Congressional Research Service, 2011.
- Kroft, Kory and Matthew J. Notowidigdo, "Should Unemployment Insurance Vary with the Unemployment Rate? Theory and Evidence." *NBER Working Paper 17173*, June 2011. Accessed on Nov 14, 2012. <http://www.nber.org>
- Izraeli, Oded and Sherman Folland, "State Income, Employment, Infrastructure and Well-Being: Do Party Control and Political Competition Matter?" *Social Science Research Network*, May 2007. Accessed on Nov 14, 2012. <http://ssrn.com/>
- Isaacs, Katelin. *Unemployment Insurance: Consequences of Changes in State Unemployment Compensation Laws*. Washington, DC: Congressional Research Service, 2011.
- Isaacs, Katelin and Julie Whittaker. *Unemployment Insurance: Programs and Benefits*. Washington, DC: Congressional Research Service, 2012.
- Jaimovich, Nir and Henry E. Siu, "The Trend is the Cycle: Job Polarization and Jobless Recoveries," *NBER Working Paper No. 18334*, August 14, 2012. Accessed Nov 14, 2012. <http://www.nber.org>

- Lalive, Rafael, Jan C. van Ours, and Josef Zweimüller. "Equilibrium Unemployment and the Duration of Unemployment Benefits." *Journal of Population Economics* 24, no. 4 (2011): 1385–1409.
- Mayer, Gerald. *The Trend in Long-Term Unemployment and Characteristics of Workers Unemployed for More than 99 Weeks*. Washington, DC: Congressional Research Service, 2010.
- Meyer, Bruce. "Unemployment Insurance and Unemployment Spells," *Econometrica* 58, no. 4 (1990): 757–782.
- Moffitt, Robert. "Unemployment Insurance and the Distribution of Unemployment Spells," *Journal of Econometrics* 28, no. 1 (1985): 85–101.
- National Governor's Association. *Former Governors' Bios*. Accessed Nov 11, 2012. <http://www.nga.org>
- Nichols, Austin and Margaret Simms. *Racial and Ethnic Differences in Receipt of Unemployment Insurance Benefits During the Great Recession*. Washington, DC: Urban Institute, 2012.
- Nicholson, W. and K. Needels. (2006). "Unemployment Insurance: Strengthening the Relationship Between Theory and Policy." *Journal of Economic Perspectives* 20, no. 3 (2006): 47–70
- Office of Retirement & Disability Policy, U.S. Social Security Administration. "Annual Statistical Supplement 2012: Unemployment Insurance Program Description and Legislative History," <http://www.ssa.gov/policy/docs/statcomps/supplement/2012/unemployment.html> Accessed Nov 12, 2012).
- U.S. Bureau of Economic Analysis. 2012. "Regional Data, GDP by State: Percent of U.S." Accessed Nov 8, 2012. <http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1>
- U.S. Bureau of Labor Statistics. n.d. "Local Area Unemployment Statistics." U.S. Department of Labor. Accessed Nov 8, 2012. <http://data.bls.gov/cgi-bin/surveymost?la>
- U.S. Bureau of Labor Statistics. n.d. "Employment, Hours, and Earning –State and Metro Area Database. Accessed Nov 8, 2012. <http://www.bls.gov/sae/>
- US Census Bureau. n.d. "Table B02001: RACE." In 2005 American Community Survey. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- US Census Bureau. n.d. "Table B02001: RACE." In 2006 American Community Survey. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table

- US Census Bureau. n.d. "Table B02001: RACE." In 2007 American Community Survey 1-Year Estimates. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- US Census Bureau. n.d. "Table B02001: RACE." In 2008 American Community Survey 1-Year Estimates. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- US Census Bureau. n.d. "Table B02001: RACE." In 2009 American Community Survey 1-Year Estimates. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- US Census Bureau. n.d. "Table B02001: RACE." In 2010 American Community Survey 1-Year Estimates. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- US Census Bureau. n.d. "Table B02001: RACE" In 2011 American Community Survey 1-Year Estimates. Accessed Nov 19, 2012. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2005 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2005 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2006 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2006 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2007 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2007 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2008 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2008 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>

- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2009 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2009 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2010 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2010 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
- U.S. Census Bureau. n.d. "All States in the United States: Table B20002, Median Earnings In The Past 12 Months (In 2011 Inflation-Adjusted Dollars) By Sex For The Population 16 Years And Over With Earnings In The Past 12 Months." In 2011 American Community Survey. Accessed Nov 17, 2012. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
- U.S. Congress Joint Economic Committee Staff. 2011. "Addressing Unemployment After the Great Recession: The Crucial Role of Workforce Training." *Joint Economic Committee*. Washington, DC: United States Congress. Accessed Nov 14, 2012. http://www.jec.senate.gov/public/?a=Files.Serve&File_id=97c2e98e-a791-47fc-a324-6b407948e083

APPENDIX

In addition to the models discussed in the methodology, other models were also tested for this study. A quadratic model was included because an additional week of unemployment benefits in the previous quarter is potentially associated with an increase in the unemployment rate. However, it is expected that the unemployment rate will not decrease with an additional week of unemployment benefits. This is not the only functional form tested. To observe the elasticity of UI benefits on the unemployment rate, a log model was also conducted. Results for these models can be found in the Appendix Table.

APPENDIX TABLE: EMPIRICAL FINDINGS FOR ADDITIONAL MODELS

<i>Variable</i>	<i>OLS w/all controls</i>	<i>OLS w/o all controls</i>	<i>Quad w/o all controls</i>	<i>Log-Log w/o all controls</i>
Lagged UI Weeks	0.071 (0.010)***	0.081 (0.009)***	0.130 (0.015)***	-
Construction Rate (%)	-0.277 (0.114)**	-	-	-
Financial Services Rate (%)	-0.141 (0.172)	-0.185 (0.102)*	-1.484 (0.615)**	-0.229 (0.075)***
Manufacturing Rate (%)	0.040 (0.037)	-	-	-
Republican Governor	0.184 (0.223)	-0.094 (0.225)	0.014 (0.125)	0.012 (0.020)
African-Americans (%)	-0.003 (0.030)	0.042 (0.016)**	0.220 (0.256)	0.034 (0.040)
Whites (%)	-0.056 (0.028)**	0.001 (0.010)	0.135 (0.066)**	0.012 (0.008)
State GDP (%)	0.020 (0.062)	0.138 (0.047)***	-2.069 (0.663)***	-0.199 (0.098)**
Median Income	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)***	-0.000 (0.000)*
2005	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
2006	-0.319 (0.199)	-0.365 (0.155)**	0.482 (0.269)*	-0.043 (0.039)
2007	-0.441 (0.125)***	-0.485 (0.112)***	-0.208 (0.166)	-0.098 (0.028)***
2008	0.492 (0.229)**	0.445 (0.186)**	0.816 (0.232)***	0.101 (0.037)***

UNEMPLOYMENT INSURANCE BENEFITS

<i>Variable</i>	<i>OLS w/all controls</i>	<i>OLS w/o all controls</i>	<i>Quad w/o all controls</i>	<i>Log-Log w/o all controls</i>
2009	0.927 (0.404)**	0.783 (0.382)**	1.376 (0.268)***	0.324 (0.039)***
2010	-0.515 (0.568)	-0.800 (0.523)	0.790 (0.349)**	0.239 (0.048)***
2011	-1.470 (0.608)**	-1.721 (0.545)***	0.157 (0.395)	0.146 (0.051)***
Weeks2	-	-	-0.001 (0.000)***	-
Weeks Log	-	-	-	0.272 (0.031)***
Constant	10.524 (3.195)***	3.923 (1.352)***	9.732 (7.799)	1.547 (0.821)*
Observations	1,161	1,350	1,350	1,350
R-squared	0.776	0.755	0.891	0.881
r2_w	-	-	0.891	0.881
N_clust	43	50	50	50
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				