

The Great Recession and Okun's Law

By: Ryann Nolan

Linfield College – Department of Economics

Spring 2013

Abstract: Okun's Law expresses a relationship between economic growth and changes in the unemployment rate. Recent work by Herzon (2012) and Duy (2012) provide evidence that the relationship between growth and changes in the unemployment rate may have changed as a result of the Great Recession. I test for this by estimating the growth-unemployment relationship using a panel model across fifty U.S. states from the years 1998 to 2011 controlling for the labor force participation rate. I find that the unemployment rate has indeed been more responsive to economic growth after the Great Recession than it was before the recession and hypothesize about some reasons for this change.

Okun's Law – Relationship between output growth (GDP growth rate) and the unemployment rate.

- GDP growth and the unemployment rate have a negative relationship.
- In order to maintain a constant unemployment rate, output growth has to be equal to the sum of the labor force and the labor productivity growth. This has roughly remained at 3% since 1960.

Theory

- Recent studies done by Herzon (2012) and Duy (2012) have found that post The Great Recession, the GDP growth rate has a stronger effect on the unemployment rate, than prior to the recession.
 - This relationship is unexpected. We would normally expect that after a recession a greater growth rate in GDP would be needed in order to lower the unemployment rate.
- This project contributes to these studies by testing this relationship using a panel data set across all 50 states in the United States from the years 1998-2011, controlling for the years post the recession in 2008.

• Equation and Variables

$$\text{UDIFF}_{it} = f(\text{RD}_{it}, \text{RGRW}_{it}, \text{RGRW} * \text{RD}_{it}, \text{LFPR}_{it})$$

- Subscript “it”- Indicates that the data is a panel set. This means that the variables span both cross sections (each of the 50 states) and time (1998-2011).
- UDIFF_{it} – Dependent variable. Annual change in the unemployment rate in the i^{th} state from 1998 to 2011
- RD_{it} - intercept dummy variable for every year after the Great Recession, 2009-2011
- RGRW_{it} – The GDP Growth Rate in each state. **Hypothesis: Negative sign**
- $\text{RGRW} * \text{RD}_{it}$ - The product of the GDP growth rate and the post-recession dummy variables. This variable controls for any change in the effect of the growth rate after the recession and allows for the comparison of the effects prior and post the recession. **Hypothesis: Negative sign.**
- LFPR_{it} – Labor force participation rate. This variable is a ratio of the number of people in state’s population, above the age 16, who are participating in the labor force. **Hypothesis: Positive sign.**

Table 1 – Empirical Results (t-stats in parenthesis)

Variable	Regression 1	Regression 2
Constant	.70 (.0000)	-7.89 (.0002)
Post-Recession Dummy	.95 (.0000)	1.17 (.0000)
Growth Rate	-.298 (.0000)	-.298 (.0000)
Growth Rate * Post-Recession Dummy	-.499 (.0000)	-.476 (.0000)
Labor Force Participation Rate		.127 (.0001)
Adjusted R-Squared	.446	.459

Empirical Analysis

Regression 1 does not include the LFPR. I ran this regression as a comparison for the second regression which included all of the variables. I wanted to be able to see how large of an impact the labor force participation rate was having on my results. I theorized that perhaps discouraged workers leaving the labor force were causing a skewed drop in the unemployment rate.

Due to the severity of the recession, skilled workers were laid off from their jobs. The theory is that these skilled workers exited the labor force after a few months when they were not able to find jobs that required them to use their skills. These workers did not actively search for jobs and reenter the labor force as unemployed workers because they were not willing to take a job in a position lower than they had previously held. Instead, they waited for jobs that required them to use their skills and were close to the same ranking as their previous positions. As growth resumes, people who are not part of the labor force become more attracted to finding work and reenter the labor force as employed workers. If this is occurring, it would help explain the accelerated decrease of the unemployment rate post the recession.

Empirical Analysis

Regression 1

- For every one percent change in the GDP growth rate there will be a $-.298$ percent change in the change of the unemployment rate, prior to the recession.
- Post the recession, for every one percent change in the GDP growth rate there will be a $-.797$ ($-.298 + -.499$) change in the change of the unemployment rate

Regression 2

- For every one percent change in the GDP growth rate there will be a $-.298$ percent change in the change of the unemployment rate, prior to the recession.
- Post the recession for every one percent change in the GDP growth rate there will a $-.774$ change in the change in the change of the unemployment rate

Controlling for the labor force participation rate in regression 2 did not alter the results significantly. This indicates that the LFPR is not the reason for the accelerated decrease in the unemployment rate post the recession.

Conclusion

My results indicate that during the post-recession years, the GDP growth rate had a greater effect on the change in the unemployment rate. These results support my hypothesis and Herzon's and Duy's results from their studies.

A few different possible explanations for the unexpected relationship between GDP growth and the unemployment rate have been explained by Ben Herzon.

- Unemployment is correcting for an earlier overshoot
- Weather, seasonal adjustments, or a temporary productivity reversal.
- Incorrect data. Most likely GDP which may be adjusted up.
- Level and growth rate of America's potential output is lower than we thought. If this is the case it means we are closer to the natural rate of unemployment than we thought. This means that the natural rate of unemployment is actually higher than the historically popular 6%.
 - This would explain why unemployment is falling so quickly with low GDP growth.