Should Do (Ch9): Okun's Law

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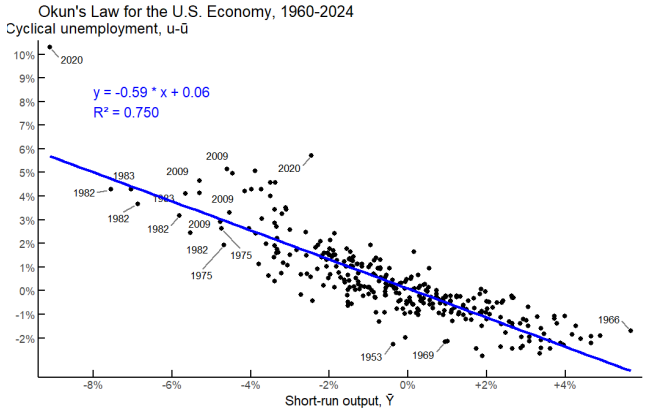
Introduction

Okun's law is the relationship between unemployment and economic growth. Using data from FRED we can plot this relationship. The graph shows that as unemployment rises above its natural rate, short run output decreases.



These functions describe the linear relationship shown in the graph:

- u is the current unemployment rate,
- $\bar{u}$ is the natural unemployment rate (status quo),
- $\tilde{Y}$ is the short-run output,

$$u - \bar{u} = \tilde{Y} - \frac{1}{2} \tag{1}$$

or

$$\Delta u = \tilde{Y} - \frac{1}{2} \tag{2}$$

$*$note: $-\frac{1}{2}$ is a rough estimate in further calculation we will use the slope of the trend line.

1 Expected Unemployment

Okun's can be used to predict unemployment using short run output. To do this we will use the slope from the trend line. The model has an R^2 of 75% meaning this model explains 75% of the variation in the data, not bad.

Prediction formula:

$$u - \bar{u} = -0.59\bar{Y} + 0.06 \tag{3}$$

In year 1 $\tilde{Y}$ is equal to 1% at this rate cyclical unemployment is -0.53%. This proves that when actual output is higher then potential output unemployment is typically lower then at it's natural level.

In year 2 $\tilde{Y}$ is equal to 0%. When short run output is the same as potential output it will give us the natural unemployment rate at 0.06%.

Year 3 has a $\tilde{Y}$ of -2%. This puts cyclical unemployment at 1.24%. When the short run output is below its potential it increases the unemployment rate.

1.1 Predicted Short Run Output

2). Rarely do we get data on short-run output to predict unemployment. Because data for GDP is released quarterly, but unemployment figures are released monthly, we could use Okun's Law to predict short-run output using unemployment. Using last year's data on cyclical unemployment, what are the predicted values for short-run output based on Okun's Law? How confident are you in your predictions? Please compare your forecasts to any available short-run data and explain any differences.

It is difficult to gather data on the monthly short run output. GDP is typically used to measure short run output, but it is only released quarterly. However, unemployment figures are released monthly. Using unemployment rates we can predict the monthly short run output using the previous model $y = -0.59x + 0.06$.

Date	**Actual Cyclical Unemployment (%)**	**Predicted Short-Run Output (%)**	**Actual Short Run (%)**
1/1/2024	-0.715	0.482%	0.2158%
2/1/2024	-0.515	0.364%	0.2158%
3/1/2024	-0.515	0.364%	0.2158%
4/1/2024	-0.512	0.362%	0.2386%
5/1/2024	-0.412	0.303%	0.2386%
6/1/2024	-0.312	0.243%	0.2386%
7/1/2024	-0.210	0.184%	0.2630%
8/1/2024	-0.210	0.184%	0.2630%
9/1/2024	-0.307	0.243%	0.2630%
10/1/2024	-0.307	0.241%	0.2688%
11/1/2024	-0.207	0.182%	0.2688%
12/1/2024	-0.307	0.241%	0.2688%

Table 1: Cyclical Unemployment and Short-Run Output Predictions

There is some difference in the predicted values and the actual values. However, this is to be expected with predictions. The predicted values shown are the values that are the middle of a range determined by the linear regression. This means we can still be somewhat confident in our predictions. Okun's law is not perfect but it provides a nice estimate of what short run output might be.