



## Okun's Law in Recession and Recovery

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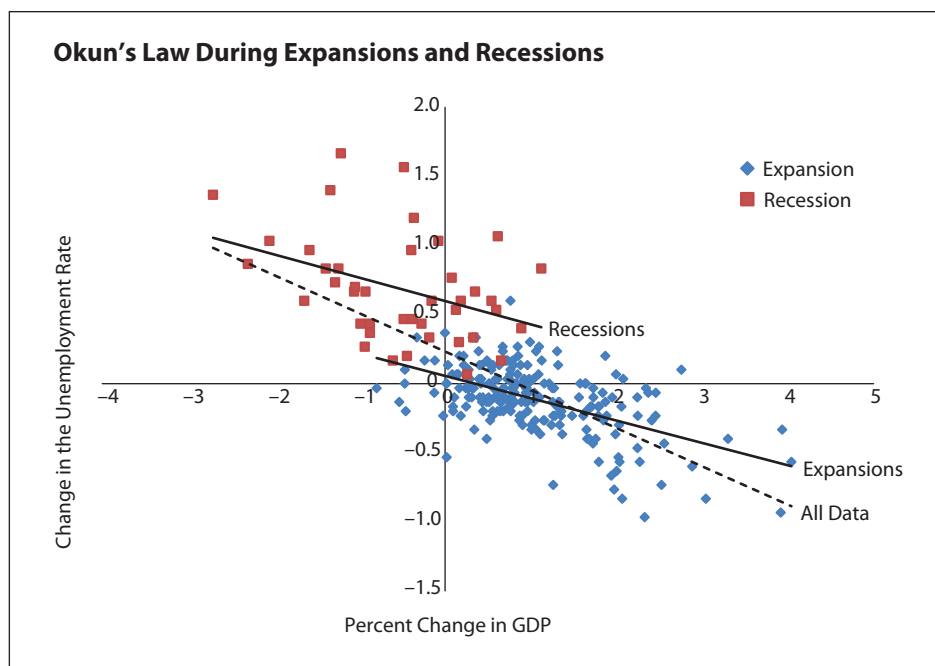
Okun's law is a popular back-of-the-envelope calculation relating the growth rate of output to the change in the unemployment rate.<sup>1</sup> Arthur Okun originally posited the law in 1962 as a means of estimating potential output. Recently, some academic studies have questioned whether the relationship still holds after the Great Recession and whether it varies across phases of the business cycle.<sup>2</sup>

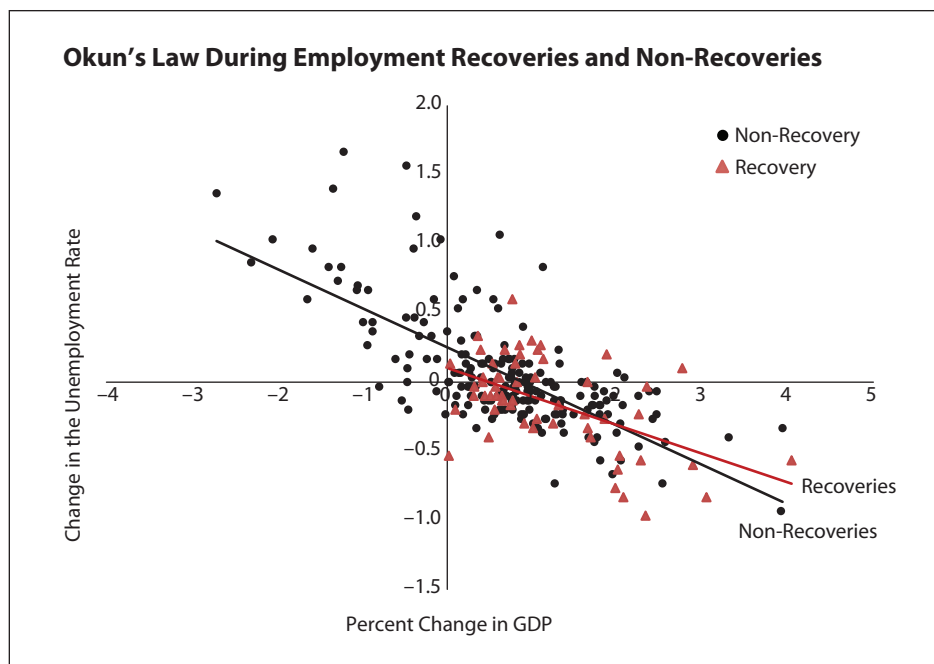
The first chart shows the quarter-to-quarter change in the unemployment rate and the quarter-to-quarter percent change in output (measured by gross domestic product [GDP]) for the period 1948:Q2 through 2013:Q1. Each point on the chart represents the quarterly values of these two measurements. The blue diamonds denote observations during expansions, and the red squares denote observations during recessions. These subperiods are defined by the National Bureau of Economic Research Business Cycle Dating Committee, according to which recessions start at the peak of a business cycle and end at the trough.

A cursory examination of the chart reveals that the relationship between unemployment and output appears to shift over the business cycle. The slopes of the lines that best fit the expansion and recession subperiods are similar ( $-0.14$  and  $-0.12$ , respectively); the difference across business cycle phases appears in the intercept. In addition, the slopes of the lines for the subperiods are both much flatter than the slope of the line that best fits the entire dataset ( $-0.25$ ).

**The relationship between unemployment and output growth changes during recoveries.**

The second chart shows the data over the same period but instead focuses on post-recession employment recoveries (red triangles) and non-recoveries (black circles). A recovery begins the period after a trough and ends the





period that employment reaches its pre-recession level. One of the recent criticisms of Okun's law is that it breaks down during recoveries—in particular, during the past three recoveries, which have been termed “jobless recoveries.”

The non-recoveries line in the second chart indicates a high degree of correlation and is similar to the all-data line in the first chart ( $-0.26$ ). The recoveries line, however, is much flatter ( $-0.17$ ), suggesting changes in GDP are associated with much smaller (in absolute value) changes in the unemployment rate. This finding is perhaps not surprising given the relatively slow employment growth during the recent recoveries, but also suggests that the weakening of Okun's law may be restricted to periods immediately following recessions.

The media and policymakers often refer to Okun's law in discussing their expectations of how quickly the unemployment rate will recover after recessions. Recent questions on why unemployment does not appear to be falling as quickly as expected based on Okun's law estimates for previous recoveries may be answered by considering how Okun's coefficient changes across phases of the business cycle. ■

## Notes

<sup>1</sup> Okun (1962) proposed the relationship without theoretical underpinnings. For a discussion of the nature of the relationship and how it might come about, see Andolfatto (2010) and Wen and Chen (2012).

<sup>2</sup> See, for example, Knotek (2007), Owyang and Sekhposyan (2012), and Ball, Leigh, and Loungani (2012). These studies also test for differences over time instead of across phases of the business cycle.

## References

- Andolfatto, David. “Okun's Law Rules the FOMC.” *MacroMania* (blog), December 15, 2010; <http://andolfatto.blogspot.ca/2010/12/okuns-law-rules-fomc.html>.
- Ball, Laurence M.; Leigh, Daniel and Loungani, Prakash. “Okun's Law: Fit and Fifty?” NBER Working Paper No. 18668, National Bureau of Economics, January 2013; [http://www.nber.org/papers/w18668.pdf?new\\_window=1](http://www.nber.org/papers/w18668.pdf?new_window=1).
- Knotek, Edward S. II. “How Useful Is Okun's Law?” *Federal Reserve Bank of Kansas City Economic Review*, Fourth Quarter 2007, 92(4), pp. 73-103; <http://www.kc.frb.org/publicat/econrev/pdf/4q07knotek.pdf>.
- Okun, Arthur M. “Potential GNP: Its Measurement and Significance,” in *Proceedings of the Business and Economics Statistics Section*. Alexandria, VA: American Statistical Association, 1962, pp. 98-103.
- Owyang, Michael T. and Sekhposyan, Tatevik. “Okun's Law over the Business Cycle: Was the Great Recession All that Different?” *Federal Reserve Bank of St. Louis Review*, September/October 2012, 94(5), pp. 399-418; [http://research.stlouisfed.org/publications/review/12/09/399-418Owyang\\_rev.pdf](http://research.stlouisfed.org/publications/review/12/09/399-418Owyang_rev.pdf).
- Wen, Yi and Chen, Mingyu. “Okun's Law: A Meaningful Guide for Monetary Policy?” *Federal Reserve Bank of St. Louis Economic Synopses*, 2012, No. 15, June 8, 2012; [http://research.stlouisfed.org/publications/es/12/ES\\_2012-06-08.pdf](http://research.stlouisfed.org/publications/es/12/ES_2012-06-08.pdf).

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