

Do Monetary Policy Shocks Affect Trend Labor Productivity?

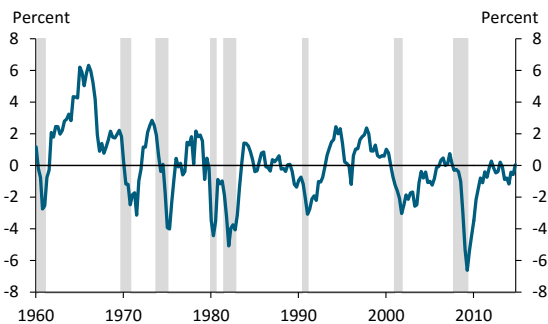
By Willem Van Zandweghe

Empirical analysis suggests labor productivity temporarily increases following a surprise expansion of monetary policy, with no longer-term effects. This increase can be explained by firms' more intense use of available production factors. As firms cannot operate their production factors above the normal capacity rate indefinitely, surprise expansions of monetary policy do not significantly raise trend labor productivity.

During the past six years of slow economic growth, economists and policymakers have expressed repeated concern that the financial crisis and recession of 2007-09 may have harmed the U.S. economy's productive capacity. A sustained period of weak demand could erode the economy's productive capacity by dampening trend productivity as the business sector holds back on capital formation, business formation, and innovation.

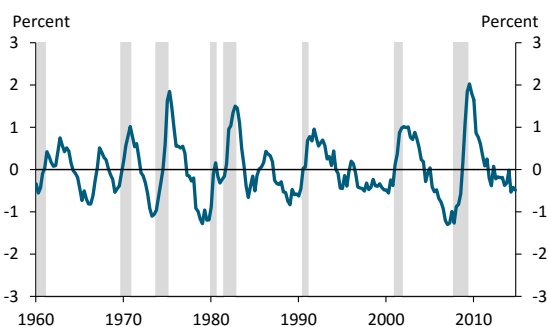
To assess how a recession may affect trend labor productivity, I analyze data constructed by Fernald for the three major sources of variations in labor productivity: capital and labor per hour worked, the intensity with which firms use available capital and labor inputs, and total factor productivity (TFP), a residual component that captures the productivity-enhancing effects of various unmeasured factors.

Chart 1: Capital and labor use



Note: Gray bars denote NBER-defined recessions.
Sources: Fernald and author's calculations.

Chart 2: Cyclical capital and labor per hour



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Sources: Fernald and author's calculations.

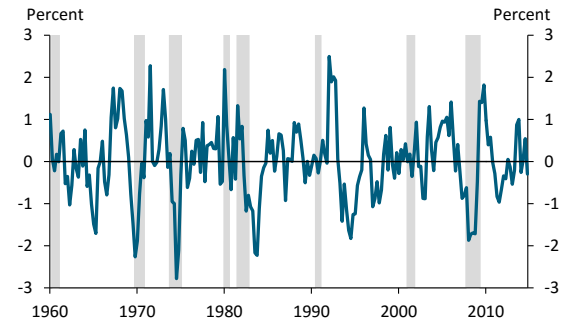
The first two sources of fluctuations in labor productivity appear purely cyclical. Chart 1 shows that the utilization rate of capital and labor inputs declines in recessions and rises in expansions. This source reflects cyclical fluctuations in demand and does not affect trend labor productivity, as firms cannot permanently use capital and labor above their normal capacity rate. Chart 2 shows that the cyclical component of capital and labor per hour typically increases during recessions and declines during expansions. This pattern reflects that in recessions, a decline in hours worked in the face of slowly adjusting capital and labor quality lifts the ratio of capital and labor to hours worked, whereas in recessions, a rise in hours worked lowers the ratio. Because the cyclical movements in capital and labor per hour are primarily driven by the fluctuations in hours worked, this source of movements in labor productivity does not necessarily point to supply-side effects.

The fluctuations in TFP suggest trend productivity may fluctuate with the business cycle. Chart 3 shows that cyclical fluctuations in utilization-adjusted TFP are positively associated with the business cycle. To the extent variations in TFP reflect the ebb and flow of technological progress, this source of fluctuations suggests long-lasting, supply-side effects.

The cyclical decline in TFP during the most recent recession may have reduced trend productivity, but a vigorous recovery of TFP may boost trend productivity.

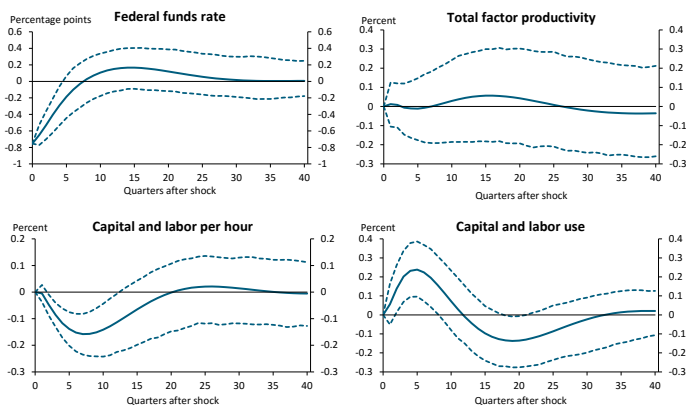
Traditionally, we assume monetary policy stabilizes economic activity and inflation without affecting the economy's productive capacity—that is, its potential output. However, if weak demand erodes capacity, then monetary policy may be able to expand capacity by stimulating economic activity. Accommodative monetary policy raises demand for goods and services, thus promoting investment and improving the climate for new business startups.

Chart 3: Cyclical total factor productivity



Note: Gray bars denote NBER-defined recessions.
Sources: Fernald and author's calculations.

Chart 4: Responses to a monetary policy shock



Note: Dashed lines indicate 95 percent confidence intervals.
Sources: Fernald, Bureau of Economic Analysis, Bureau of Labor Statistics, Haver Analytics, author's calculations.

Chart 4 presents the responses of labor productivity and its components to a surprise easing in the stance of monetary policy. Such a surprise lowers the federal funds rate for about two years. The response of TFP is of particular interest, as it may reflect improvements in technology. However, TFP is essentially unresponsive to the monetary policy shock, suggesting policy actions have no effect on the economy's productive capacity.

The responses of capital and labor per hour and capital and labor use are statistically significant but do not constitute evidence of supply-side effects. Capital and labor per hour decline temporarily as hours worked rise to meet higher output demand, but the ratio eventually returns to its pre-shock level. Capital and labor use rises temporarily as fewer machines and workers remain idle, some factories run additional shifts, and more workers put in extra effort to meet the higher demand. The response of labor productivity (not shown) mimics that of capital and labor use. This indicates higher factor use is the dominant channel through which a monetary policy shock affects labor productivity, with no apparent supply-side effects.

References

Fernald, John. 2014. "A Quarterly, Utilization-Adjusted Series on Total Factor Productivity," Federal Reserve Bank of San Francisco, working paper no. 2012-19, April.

* *Willem Van Zandweghe is an assistant vice president and economist at the Federal Reserve Bank of Kansas City. For more, see "[Monetary Policy Shocks and Aggregate Supply](#)," Economic Review, forthcoming. The views expressed are those of the author and do not necessarily reflect the positions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.*