

The Lasting Damage from the Financial Crisis to U.S. Productivity

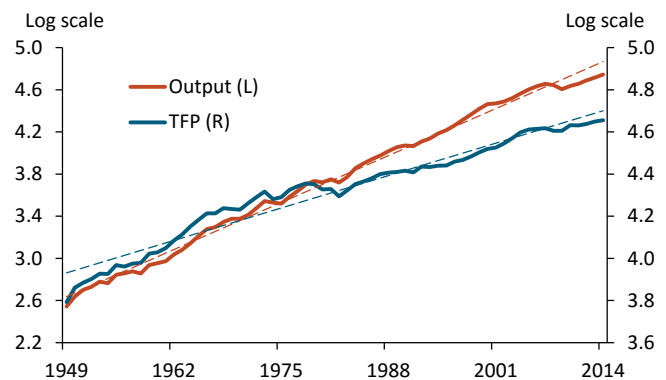
By Michael Redmond and Willem Van Zandweghe

The 2007-09 financial crisis may have altered the relationship between credit conditions and total factor productivity growth. During normal times, productivity growth fluctuates over the business cycle largely unaffected by credit conditions. During the crisis, however, distressed credit markets significantly dampened productivity growth. As productivity's sensitivity to credit conditions once again diminished after the crisis, the post-crisis easing of credit conditions did not boost productivity growth, leaving productivity, and therefore output, on a lower trajectory.

The financial crisis and recession of 2007–09 left deep scars on the U.S. economy. Output of goods and services declined sharply during the crisis, and while output began to grow afterward, its level has not caught up to its pre-crisis trend. Likewise, total factor productivity (TFP), a key source of output growth in the long run, declined and has remained on a lower trajectory than before the crisis (Chart 1).

Tighter credit conditions may have contributed to these declines. Obtaining credit was more difficult and expensive for firms during the crisis, as widespread fear and uncertainty drove lenders to raise interest rates and lend more cautiously. The reduced credit supply may have prevented firms from investing in innovation, lowering TFP—and, subsequently, real activity—in the process.

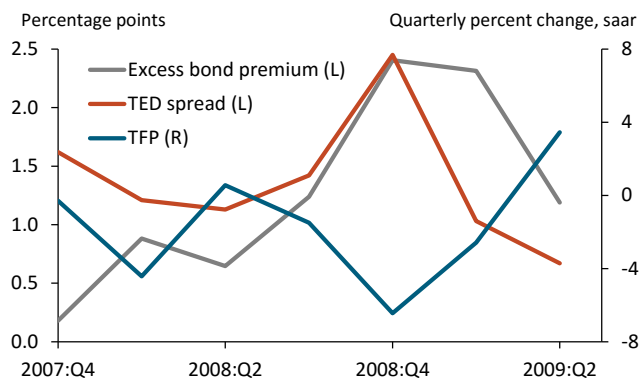
Chart 1: Output and productivity



Note: Dashed lines represent long-run trends and are estimated as linear regression lines.

Sources: Bureau of Labor Statistics and Haver Analytics.

Chart 2: Credit conditions and productivity



Sources: Fernald, Federal Reserve Bank of St. Louis FRED, Gilchrist and Zakrajšek, and Haver Analytics.

Credit supply conditions have a close negative relationship with TFP during the last recession. Chart 2 displays two measures of credit conditions: the excess bond premium (obtained from Gilchrist and Zakrajšek), which measures credit supply conditions as deviations in the pricing of corporate bonds relative to the issuer's measured default risk, and the TED spread, which is the difference between the rates at which banks can borrow from other banks and the risk-free rate. The chart also shows quarterly TFP (obtained from Fernald) as a blue line. During the first year of the recession, TFP slowed as credit conditions worsened. But in the last six months of the recession, TFP growth resumed as access to credit began to ease.

Could the decline in TFP during the recession merely reflect a less intense use of available labor? After all, indicators of the intensity with which firms use their production factors declined sharply over the same period, suggesting firms may have required less effort from workers. A decline in unobserved worker effort is consistent with the idea that firms adjust labor on all margins—paid hours as well as unobserved effort—during downturns, a pattern that characterized recessions until the 1980s. However, the last recession differed from past recessions in that it was associated with a severe financial crisis. The collapse of product demand and the lack of access to credit forced firms to cut paid hours sharply in a bid to survive. Keeping non-essential workers on the payroll while sharply reducing their labor effort was likely not viable for many firms. Indeed, Lazear, Shaw, and Stanton find evidence that worker effort actually increased during the last recession.

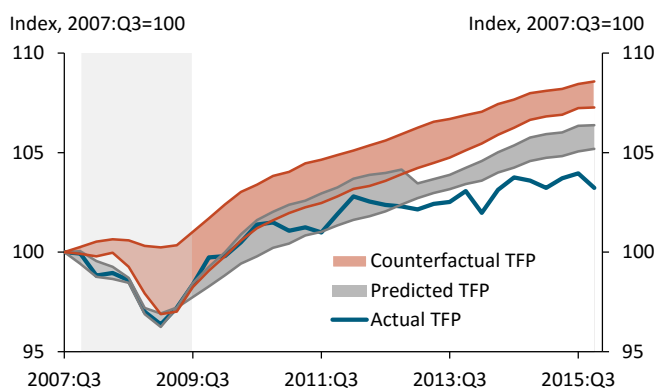
To examine whether tight credit supply impeded productivity growth during the financial crisis, we estimate a regression model that quantifies the relationship between TFP growth and credit conditions. The model relates TFP growth to a current and lagged measure of credit conditions and a measure of factor utilization. To gauge the robustness of the estimation results, we then re-estimate the model using various measures of credit conditions and factor utilization. As the financial crisis may have affected the usual economic relationships between the variables, we allow the estimated coefficients to differ during the crisis and normal times. Indeed, the economy may have been more vulnerable to shocks during the crisis due to the elevated level of debt relative to income and because the response of monetary policy was constrained by the zero lower bound on interest rates (Ng and Wright).

The regression analysis indicates that during the financial crisis, the sharp deterioration in credit conditions was associated with a significant slowing of TFP growth; during normal times, our results show no significant association between the two. The estimation results for the utilization variables indicate factor utilization did not dampen TFP growth during the financial crisis as it did during past recessions.

The results suggest the financial crisis slowed TFP growth due to the distress in credit markets and the heightened sensitivity of TFP growth to credit conditions. The temporary decline in the growth rate of TFP during the crisis permanently reduced the level of TFP because when credit conditions (and productivity's sensitivity to those conditions) normalized, TFP growth did not receive a subsequent boost. As a result, TFP remained on a lower trajectory during the economic recovery.

To assess how TFP would have evolved had the financial crisis not affected it, we perform a counterfactual exercise. Chart 3 shows the historical path of TFP (blue line) along with a range of predictions of TFP from the onset of the financial crisis onward (gray shaded region) generated by our regressions. The regressions effectively capture the drop

Chart 3: Counterfactual path of productivity



Note: Gray bar denotes NBER-defined recession.
Sources: Fernald and authors' calculations.

and rebound in TFP through 2012, but they fail to account for the shallower path of TFP since then. The orange shaded band shows the range of counterfactual paths TFP might have followed had its relationship with credit conditions and factor utilization during the financial crisis remained the same as in normal times. The counterfactual exercise suggests the drop in factor utilization would have lowered TFP even though the distress in credit markets would not have had a visible effect. However, as utilization normalized, this effect on TFP would have dissipated, leaving the level of TFP noticeably higher by the end of 2015. This exercise indicates that by cutting firms' access to credit and upending the usual macroeconomic relationships, the financial crisis had a lasting effect on productivity.

References

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Michael Redmond is an associate economist at the Federal Reserve Bank of Kansas City. Willem Van Zandweghe is an assistant vice president and economist at the bank. For more, see "[The Lasting Damage from the Financial Crisis to U.S. Productivity](#)," Economic Review, forthcoming. The views expressed are those of the authors and do not necessarily reflect the positions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.