



[Investment in Productivity and the Long-Run Effect of Financial Crises on Output](#)

CFM-DP2016-30

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Severe recessions during financial crises are often not followed by an economic boom. Growth in years after a crisis is, on average, comparable to growth in years prior to a crisis. This means that output does not recuperate to its original trend level, leaving a permanent gap between the economy's original projected path and actual output. This pattern is observed around financial crises over the past century, and a similar lack of recovery has emerged after the 2008-9 financial crisis. By the start of 2016, GDP in the United States had deviated by 15% from the level that an extrapolated trend between 2000 and 2007 predicts. This implies that annual per capita income could on average have been \$8000 higher today if no crisis had occurred. Similar gaps are found throughout developed economies, including France, Germany, and the United Kingdom.

The aim of this paper is to understand the mechanisms through which financial crises have such long-term effects. In particular, I test the notion that a crisis affects the ability of firms to borrow for productivity-enhancing investments, which are an important ingredient for long-term growth. While a growing theoretical literature suggests that this channel explains why financial crises have permanent effects, causal evidence has remained scarce.

Using a linked lender-borrower dataset, I assess whether firms that rely on loans from banks that performed poorly during the 2008-9 financial crisis were more likely to reduce investments in productivity such as research and development (R&D) or intangible capital. Following Chodorow-Reich (2014), I use exogenous characteristics such as the composition of a bank's asset-portfolio or its exposure to Lehman Brothers' bankruptcy to measure the health of banks at the onset of the crisis. I find that growth in R&D and intangible capital investments declines by 4 to 8 percentage points for each standard deviation decrease in the health of banks from which these firms borrowed before the crisis.

I then show that productivity-enhancing investments, instrumented by bank health, explain growth in the aftermath of the crisis. For each percentage point decline in growth of R&D and intangible capital investments, annual output growth between 2010 and 2014 declines by 0.08 percentage point. This result is robust to the inclusion of various firm-level control variables and fixed effects. Alternative forms of investments, particularly in physical capital, also decline during the crisis, but they do not explain growth over the medium run. A partial equilibrium aggregation exercise suggests that output would be 12% higher amongst sampled firms if no crisis has occurred.