

## The Responses of Small and Large Firms to Tight Credit Shocks: The Case of 2008 through the Lens of Gertler and Gilchrist (1994)

By Marianna Kudlyak, David A. Price, and Juan M. Sánchez

**Do large firms and small firms behave differently when credit becomes more costly or harder to obtain? Past research has found that small firms are more likely to be credit-constrained and thus tend to be affected more negatively than large firms during such times. Recent findings from the 2007–2009 recession, however, raise questions about the roles of small and large firms during periods of tight credit.**

A widespread view in macroeconomics holds that the effects of tight credit serve as a transmission belt that turns shocks in financial markets into shocks in the “real” economy. Adverse conditions for firms in credit markets curtail the economic activity of those firms, and thereby cause economic shocks in financial markets to be amplified into real-world shocks affecting sales, inventories, and, ultimately, employment. Such conditions in credit markets may arise from contractionary monetary policy or from other events making credit costlier or less accessible. In the language of macroeconomics, the credit difficulties of firms act as a *financial accelerator*.

In the past decade and a half, economists have presented evidence for this mechanism, paying special attention to small firms. Shocks in credit markets are found to have more serious negative effects on small firms than on large ones: Smaller firms, being more credit-constrained, feel the pinch of tight credit more acutely.

The recession of 2007–2009 was particularly related to dysfunctions in credit markets. Two of

the authors of this *Economic Brief*, Marianna Kudlyak of the Richmond Fed and Juan M. Sánchez of the St. Louis Fed, have looked at data for this recession to determine whether firms responded to credit conditions in the third quarter of 2008 in a manner consistent with earlier scholarship. Their findings, which will be presented in a forthcoming paper, raise questions about the roles of small and large firms during periods of tight credit.

Probably the most influential paper assigning a central role to small firms is a 1994 article in the *Quarterly Journal of Economics* by Mark Gertler of New York University and Simon Gilchrist of Boston University.<sup>1</sup> Gertler and Gilchrist look at the behavior of small and large manufacturing firms around the time of five periods of contractionary monetary policy (in 1968, 1974, 1978, 1979, and 1988) and one period of “credit crunch” (in 1966). They use a Census Bureau data set called the “Quarterly Financial Report for Manufacturing, Mining, and Wholesale Trade,” which provides financial data on various categories of firms, grouped by asset size. This data set does not break out data on individual firms, but it is

nonetheless highly useful to economists because it covers both publicly held and privately held firms in its aggregate statistics—unlike sources of firm-level data, which usually are limited to publicly traded companies. Gertler and Gilchrist define small firms as those at or below the 30th percentile in assets, and large firms as those above the 30th percentile.

The results of their empirical analysis indicate that the periods of tight money or credit have affected small and large firms differently: The short-term debt of small firms (consisting mainly of bank loans) declines while that of large firms (consisting mainly of commercial paper and bank loans) rises. The sales and inventories of small firms, moreover, decline much more than that of large firms. The researchers suggest that the results reflect that large firms enjoy easier access to credit, and that their access to credit enables them to borrow to carry inventories in spite of shocks in credit markets.

Kudlyak and Sánchez seek to determine whether these findings could be reproduced in the context of the 2007–2009 recession. First, they replicate the Gertler and Gilchrist results for the earlier periods (see row 4 of the table below). Then, using the same data set and methodology as Gertler and Gilchrist, they analyze data on short-term debt, sales, and inventories around the third quarter of 2008. They find

that the short-term debt of large firms decreases relative to that of small firms, and that the sales of large firms contract relative to small firms—the opposite of the findings for the earlier periods.

The table contains the findings on sales, inventories, and short-term debt. It shows the percentage decline in the series between the start of a recession, as dated by NBER, and the following 12 quarters. Because the values in some cases continue to increase for a short time after the start of a recession, Kudlyak and Sánchez in those cases use the actual maximum achieved within a few quarters afterward. Row 1 contains the results for the 2007–2009 recession, for which the peak of the series often coincided with the third quarter of 2008. As can be seen from the table, three quarters after the shock, the sales of large firms contracted much more than those of small firms. In terms of short-term debt, small firms lagged the large firms: While short-term debt of large firms peaked two quarters after the recession started, the peak in short-term debt of small firms was five quarters after the beginning of the recession. Thus, the difference between the peak and the trough in short-term debt of large firms, -18.62 percent, occurred over six quarters, while the difference for small firms, -8.85 percent, happened over only three quarters. As new data become available, it will be possible to learn more about the long-run effect of the shock.

**Change between Trough and Peak around the NBER Recessions and Tight Money Dates**

|                                   | Sales  |        | Inventories |        | Short-term Debt |        |
|-----------------------------------|--------|--------|-------------|--------|-----------------|--------|
|                                   | Large  | Small  | Large       | Small  | Large           | Small  |
| <b>2007–2009 Recession**</b>      | -14.94 | -10.01 | -6.23       | -6.93  | -18.62          | -8.85  |
| <b>2001 Recession*</b>            | -15.33 | -8.78  | -13.36      | -10.46 | -36.95          | -12.5  |
| <b>All Recessions pre–2001***</b> | -7.73  | -7.97  | -5.11       | -5.82  | -20.44          | -7.86  |
| <b>Tight Money Dates****</b>      | -3.11  | -6.44  | -1.97       | -6.05  | -8.88           | -11.12 |

**Note:** The table contains the differences between the minimum value of the detrended series in an interval of 12 quarters following the episode and the value at the peak of the series.

(\*) The peak of the recession is 2001:Q1.

(\*\*) The peak of the recession is 2007:Q4.

(\*\*\*) The peaks of the included recessions are: 1969:Q4, 1973:Q4, 1980:Q1, 1981:Q3, and 1990:Q3.

(\*\*\*\*) Tight money periods are 1968:Q4, 1974:Q2, 1978:Q3, 1979:Q4, 1988:Q4, and 1994:Q2.

See Gertler and Gilchrist (1994, QJE) for the details.

To understand whether the patterns described above are specific to the 2007–2009 episode, Kudlyak and Sánchez then look at data for the 2001 recession (see row 2 of the table). There, too, they find that large firms take on relatively less short-term debt compared to small firms, and that the sales and inventories of large firms contract relative to small firms—the same pattern as in the recessionary period of the third quarter of 2008.

These findings are related to the work in progress by V. V. Chari and Patrick J. Kehoe of the University of Minnesota and the Minneapolis Fed and Lawrence J. Christiano of Northwestern University,<sup>2</sup> who applied the Gertler-Gilchrist methodology to 10 business cycles between 1953 and 2000. Chari, Kehoe, and Christiano find that in those business cycles, taken together, there is not a significant difference in the responses of large and small firms to recessions. (Row 3 of the table replicates the results of the exercise.) Based on their findings, Chari, Kehoe, and Christiano build a model to try to reconcile their findings with those of Gertler and Gilchrist. Examining the individual recession episodes more closely, Kudlyak and Sánchez’s study suggests that during the recent episodes, large firms were likely hurt more than small ones. This finding is consistent with the recent work by Giuseppe Moscarini and Fabien Postel-Vinay, who find that in the 1990 and the 2001 recessions, large firms were hit particularly hard in terms of employment.<sup>3</sup>

These findings invite further research into the role of small firms in contractions, whether those contractions are the result of worsening credit conditions or other shocks. The findings as to periods of tight monetary policy—with firms behaving differently in 2007–2009 than in earlier periods of worsening credit—suggest that the economy of 2008 did not entirely fit the longstanding model

in which small firms contract more than large firms in response to credit shocks, and that the contraction of small firms is responsible for the amplification of these shocks. This, together with the findings in Chari, Kehoe, and Christiano’s research, suggests that new or different forces may have been affecting the behavior of firms in those recessions.

One possibility that could be explored is whether large firms in the recent periods of tight money or recession faced greater credit constraints than has historically been the case—for example, because large firms were more highly leveraged, which in turn leads to the large firms being more heavily constrained by the availability of credit. Other explanations may emerge for the new patterns observed in Kudlyak and Sánchez’s study. ■

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## Endnotes

- <sup>1</sup> Mark Gertler and Simon Gilchrist, “Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms,” *Quarterly Journal of Economics*, May 1994, vol. 109, no. 2, pp. 309-340.
- <sup>2</sup> V. V. Chari, Lawrence J. Christiano, and Patrick J. Kehoe, “The Gertler-Gilchrist Evidence on Small and Large Firm Sales,” Manuscript, January 2007. Online: <http://faculty.wcas.northwestern.edu/~lchrist/research/cck/notesongertlergilchristdecember2006.pdf>.
- <sup>3</sup> Giuseppe Moscarini and Fabien Postel-Vinay, “The Timing of Labor Market Expansions: New Facts and a New Hypothesis,” in *NBER Macroeconomics Annual 2008*, eds. Daron Acemoglu, Kenneth Rogoff, and Michael Woodford, pp. 1-52, Chicago: University of Chicago Press, 2009.