



Revisiting the behavior of small and large firms during the 2008 financial crisis[☆]



Marianna Kudlyak^a, Juan M. Sánchez^{b,*}

^a Federal Reserve Bank of San Francisco, United States

^b Federal Reserve Bank of St. Louis, United States

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ABSTRACT

Gertler and Gilchrist (1994) provide seminal evidence for the prevailing view that adverse shocks are propagated via credit constraints: small firms are affected more during tight credit periods than large firms. Under this view, the deep recession that followed the 2008 financial crisis is often interpreted as the propagation of the initial “credit shock.” Following Gertler and Gilchrist (1994)’s methodology, we study the behavior of small and large firms during episodes of credit disruption and extend the analysis to the 2008 financial crisis and NBER-dated recessions. We find that large firms’ short-term debt and sales contracted relatively more than those of small firms during the 2008 financial crisis and during most recessions since 1969. The results are robust to changes in the business cycle dating procedure. Using Compustat, we also find that during 2007–09 low financially-dependent firms suffered more than high financially-dependent firms. These results favor the view that a tightening of a financial or collateral constraint might not be a good representation of the 2007–09 crisis.

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1. Introduction

The propagation of shocks into large economic disturbances is a long-standing puzzle in macroeconomic analysis. “Financial accelerator” models provide a mechanism of propagation (Bernanke, et al., 1996, 1999).¹ In such models, adverse conditions in credit markets curtail economic activity by impacting sales, inventories, and eventually employment. The implication of this mechanism is that firms whose credit is the most vulnerable to disruptions in credit markets are the first to bear the negative impact of the adverse shock to the economy. In a seminal work, Gertler and Gilchrist (1994) provide evidence that serves as a basis for this prevailing view that the adverse shocks are propagated via credit markets by analyzing the behavior of small and large firms during tight credit periods.

In this paper, we revisit the question of the differences in behavior between small and large manufacturing firms, extending the analysis to the 2007–09 economic crisis, which is largely believed to be a period when credit becomes costlier or harder to obtain. It is also the period of the Great Recession that turned out to be one of the longest recessions during

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* Corresponding author.

E-mail addresses: marianna.kudlyak@sf.frb.org (M. Kudlyak), juan.m.sanchez78@gmail.com, sanchez@stls.frb.org (J.M. Sánchez).

¹ See a critical review in Smart (2002).

the postwar period. Using the same dataset as in the work by [Gertler and Gilchrist \(1994\)](#), we first replicate the results; we then analyze the behavior of short-term debt, sales, and inventories of firms, extending the period under study to the 2007–09 recession and specifically focusing on the aftermath of the financial markets turmoil in the third quarter of 2008; finally, we examine the behavior of the growth rates around NBER-dated recession peaks.

[Gertler and Gilchrist \(1994\)](#) use the Quarterly Financial Report for Manufacturing, Mining, and Wholesale Trade (henceforth QFR), which provides financial data on both publicly and privately held firms grouped by asset size. They study the behavior of small and large manufacturing firms around five episodes of contractionary monetary policy (1968, 1974, 1978, 1979, and 1988) and an episode of credit crunch (1966) in the postwar period. Gertler and Gilchrist find that immediately following a tight money date, small firms' holdings of short-term debt decline while those of large firms rise. The sales and inventories of small firms, moreover, decline much more than those of large firms. Gertler and Gilchrist interpret the results as suggesting that large firms enjoy easier access to credit, and that their access to credit enables them to borrow and carry inventories in spite of credit market shocks. In separate work using QFR data, [Oliner and Rudebush \(1996a, 1996b\)](#) find that between 1974–1991 monetary contractions induced a shift in total lending away from small firms.²

We start by replicating the findings of [Gertler and Gilchrist \(1994\)](#) for the periods prior to 1990 and for an additional tight money episode that we identify – the second quarter of 1994. We then seek to determine whether these findings can be reproduced in the context of the turmoil in the economy after September 2008, which is marked by the collapse of Lehman Brothers Inc. and is widely characterized by substantial disruptions in credit markets.³ Surprisingly, we find that following the third quarter of 2008, short-term debt and sales of large firms declined much more than that of small firms, in contrast to the prevailing view regarding the behavior of large versus small firms during previous episodes of tight money. Specifically, the short-term debt of large firms decreased from its peak by more than twice as much as that of small firms. This decrease in short-term debt was also associated with a substantially larger decline in sales for large firms as compared to small firms. This finding is robust to alternative methods used to determine the timing of the growth rate changes around the episode.

The crisis that erupted after the third quarter of 2008 closely follows the beginning of the NBER-dated 2007–09 recession (December 2007). Consequently, while on the surface the events surrounding the third quarter of 2008 resemble that of a credit or tight money shock, it might be that these events are a manifestation of other types shocks responsible for the Great Recession. To understand whether our findings regarding the 2007–09 recession are specific to this episode or are rather reminiscent of the earlier recessions, we examine the behavior of small and large firms around previous recessions. We find that in all recessions from 1969 to 2009, the short-term debt growth for large firms declined more than that of small firms. In the 2007–09 and the 2001 recessions, the growth rates of sales and inventories of large firms also declined more than that of small firms. Consequently, the behavior of small versus large firms around the 2007–09 economic crisis closer resembles the behavior of firms around previous recessions than around earlier tight money episodes.

Our finding that after the third quarter of 2008 large firms contracted much more than small firms thus is not consistent with the predictions of the financial accelerator models' response to tight money or credit crunch shocks (for example, [Bernanke, et al., 1999](#) and [Kiyotaki and Moore, 1997](#)). There are a few possible interpretations for our findings. First, it might be the case that small versus large is not a good approximation of the debt-constrained versus unconstrained dimension for firms. Alternatively, it might be that the 2007–09 period was not a period of “tight money.” To move the debate forward, we repeat our analysis by low- versus high-leverage firms and by low versus high financially-dependence firms. We conduct the analysis in the Compustat data (because such an analysis is not feasible in the publicly available aggregated QFR data). We find that in the 2007–09 crisis, the sales and short-term debt of typically low financially-dependent firms suffered more than the sales and short-term debt of typically high financially dependent firms.⁴ The evidence thus favors the theories that the 2007–09 period was not a period of “tight money,” i.e., a tightening of a financial or collateral constraint is not a good representation of the 2007–09 crisis. Rather, the shock (or a combination of shocks) associated with the 2007–09 crisis (and the recession) might primarily propagate via large or typically low-financially dependent firms.

Our findings are also consistent with the emerging literature on the propagation of shocks during the 2007–09 crisis. In a recent work, [Moscarini and Postel-Vinay \(2012\)](#) finds that in the 1990 and the 2001 recessions, large firms were hit particularly hard in terms of employment.⁵ Interestingly, pre-war evidence also shows that large firms suffered more than small firms during crises. In particular, [King \(1923\)](#) finds that small firms experienced a smaller decrease in employment during the 1920–21 recession.⁶ Closer to our study, [Chari et al. \(2013\)](#) study the behavior of sales of small and large firms around the postwar recessions prior to 2000 and their results are broadly consistent with ours.⁷ Recently, a number of

² Recently, [Tenreiro and Thwaites \(2016\)](#) study the effect of monetary policy on the U.S. economy using monetary policy shocks as identified by [Romer and Romer \(2004\)](#) and extended by [Coibon \(2012\)](#). [Gilchrist and Zakrajsek \(2012\)](#) examine the effect of financial shocks as measured by the excess bond premium.

³ In April 2010, Christina Romer wrote: “The recent recession was obviously not caused by tight monetary policy. Interest rates were not especially high when it began, and so the Federal Reserve had only limited room to cut them ... That is, despite the very low level of interest rates and all the attention to the growth of the Federal Reserve's balance sheet, current monetary policy is in fact unusually tight given the condition of the economy” ([Romer, 2010](#)).

⁴ The results hold for manufacturing as well as all firms in the sample; they also hold conditional on the firm size.

⁵ See, however, [Fort et al. \(2013\)](#) on the cyclical sensitivity of firms by age and size.

⁶ We thank Mark Bils for pointing to us this evidence.

⁷ Recently, in an article published by the Federal Reserve Bank of New York, [Sahin et al. \(2011\)](#) argue that small businesses experienced disproportionate job losses during the 2007–09 recession. Using the QFR data, they consider a nominal threshold of \$50 million to define small firms, which makes a

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