

Research Proposals: Productivity, Innovation and Entrepreneurship Program
The Persistence of Financing Constraints and the Financial Crisis of 2009
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In this project, I wish to verify whether financing constraints can explain the severity and length of the financial crisis. A big puzzle for macroeconomists is the duration of the Great Recession. Hall (2014) provides a decomposition of the 13 percent shortfall of US output from trend since 2007 into productivity, labor and capital. He finds that lost investment explains about one fourth of the output shortfall, and is the single biggest contributor to the loss of output. Aggregate capital stock in 2013 is 13% below trend. Hall (2014) ties the collapse of business investment to a surge in the cost of capital (discount rates), rather than a decline in the profitability of investment. So it seems that US firms have invested less during the Great Recession, and a drop in profitability does not explain that decline.

One possible explanation for the duration and severity of the recession is that the financial crisis led to a negative credit supply shock, which prevented firms from investing. The Great Recession started with a huge shock to the US and European banking systems: Banks made large losses on their mortgages in countries where housing bubbles had formed and burst (see for instance Brunnermeier, 2009, for an account).¹ A large literature in banking documents the fact that shocks to banks' balance sheets have a negative impact on lending (Peek and Rosengren, 1997, Khwaja and Mian, 2008, Jimenez, Ongena, Peydro and Saurina, 2012, among others). The financial crisis thus led to a reduction in the supply of credit, which may have hampered the accumulation of capital in the economy. For instance, Greenstone and Mas (2012) show that, in areas where distressed banks had a large market share, lending decreased, along with new business creation, employment and wages.

This narrative of the crisis faces, however, an important challenge. Eichenbaum (2014) recalls that credit standards, as measured through the Fed's loan officer survey, were back to normal as early as in 2010Q1. Small firms do not cite financing conditions, but a 'lack of demand' as their most important problem (the same is true in European Surveys, where "finding customers" is systematically considered as a more pressing problem than "access to finance", see European Commission, 2014). Thus, any explanation of the persistence of the crisis based on financial constraints needs to address the fact that, in the US at least, the banking system was back and ready to lend as early as 2010.

To address this issue, we start with the idea that tightening financing constraints can have a long-lasting effect when firms have to self-finance their way to their optimal size. In his theoretical approach, Moll (2014) shows that, if firms experience productivity shocks and if these shocks are transitory, then temporary shocks to financing availability may have persistent effects as they slow down the building of pledeable net worth. This mechanism of course only binds for young firms that are still far from having reached their optimal size – more mature firms have typically already “saved themselves out of the financing constraint”. However, it remains to be shown empirically whether financing constraints can have a persistent effect on young firms outcomes, and this is a the main focus of this research proposal. The goal of the research is to first provide reduced-form empirical evidence on how firm dynamics responds to a large, temporary, shock to credit supply. In a second step, these reduced form estimates

¹ Securitization, which played a big role in fuelling mortgage lending, failed to insulate the banking system, as many large vehicles are explicitly or implicitly guaranteed by banks (Acharya, Schnabl and Suarez, 2012).

could be used in a quantitative framework to see if credit frictions for young firms can have some significant explanatory power on the length of the great recession.

The empirical strategy to obtain our reduced form evidence will be the following. First, we can use US data to document the growth of firms by age group. The US Census supplies aggregate employment data by firm age group, industry and county (Business Dynamic Statistics - BDS - and Quarterly Workforce Indicators - QWI). The BDS data provide us with the average number of employees per firm for different age categories, and different industries. It is therefore possible to directly ask whether firms born during the Great Recession take longer to grow, and whether this effect is stronger in financially dependent industries (using a methodology developed by Rajan and Zingales, 1998). We can then move to a "cleaner" methodology, inspired from Greenstone and Mas (2012). We can identify locally "exogenous" credit supply shocks (by computing the market share of banks severely hit by the crisis), and look at the impact of young firm growth as a response. We can use the 2001-2002 recession as a placebo, and the 1991 recession/ 1993 jobless recovery as an alternative credit crunch.

Our second approach makes use of French census data in the context of the 1993 credit crunch. The advantage of French data over US Census is that French data provide information about the dynamics of firm balance sheets, and therefore leverage and profits. The drawback is that there are potentially less geographic variations in the credit supply shock, which would lead us to use mostly a Rajan and Zingales like-approach.

On the quantitative side, our first approach is to develop a small, mechanistic, model of firm dynamics that fits our micro evidence (as in Cabral and Mata, 2003), and see how such a calibrated micro-model can be aggregated at the macro-economic level. Our second approach is to use the quantitative framework of Buera, Fattal-Jaef and Shin, 2014, but to include our empirical, reduced-form evidence as one of the main moment used to calibrate the model.

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