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Bank size and macroeconomic shock transmission: Does the credit channel operate through large or small banks? ☆



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ABSTRACT

In this paper, I use U.S. call report data to construct a larger panel dataset with bank-level observations. I find that larger banks' lending is considerably more sensitive to the strength of their borrowers' and their own balance sheets compared to smaller banks and that the sensitivities to borrower balance sheets are larger in magnitude compared to lender balance sheets. When I incorporate various macroeconomic shocks (identified by an estimated DSGE model) into the empirical model, I similarly find that the transmission of shocks to the real economy operates mostly through large bank lending and borrower balance sheets.

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1. Introduction

Following the 08/09 financial crisis policymakers in the world have taken steps to restrict the risk taking behavior of large banks and to prevent the possible systematic consequences for the economy. These steps have started to take effect as large, global banks began shrinking their balance sheets to comply with the local and international regulations such as the Dodd-Frank Act and Basel III. The transition to stricter regulations has not been without resistance, however, and researchers and institutions

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have stressed the advantages of having large banks (some of which I mention below) including during financial crisis episodes.

In this paper, I abstract from the dynamics governing these turbulent episodes and I investigate how macroeconomic shocks are transmitted to the economy through large and small bank lending. The overall conclusion that I draw from my analysis is that macroeconomic shock transmission operates mainly through large bank lending. The empirical methodology that allows me to draw this conclusion is guided by the credit channel theory of monetary transmission.¹ According to this theory, monetary policy regulates real economic activity by changing the strength and the composition of borrowers' and banks' balance sheets. Banks react to these changes by either restricting or expanding the amount of lending which in turn determines economic activity. In this paper, I apply this theory by quantifying and comparing the reactions of large and small banks to the changes in the strength of balance sheets and by investigating how macroeconomic shocks alter these reactions. In doing so, I generalize the analysis by investigating the impact of a broader set of macroeconomic shocks (including but not limited to monetary policy shocks).

To empirically measure the large and small banks' sensitivities to their borrowers' and their own balance sheets, I use a bank-level panel dataset. To construct the dataset, I obtain quarterly data for U.S. chartered banks from the Federal Reserve's Call Reports of Condition and Income for the period 1986Q2 to 2012Q4. This allows me to use a large number of observations in my estimations. The main challenge in these estimations is identifying the two sensitivities or, in other words, determining whether banks lend more (less) because their borrowers' or their own balance sheets are improving (deteriorating). I use the internal capital markets present in the banking industry to help me identify the two sensitivities and control for bank (borrower) balance sheets when measuring the sensitivity to borrower (bank) balance sheets. To measure the sensitivity to borrower balance sheets, I follow the methodology of [Ashcraft and Campello \(2007\)](#). In so doing, I compare the loan growth rates of banks that are the subsidiaries of the same parent bank holding company (BHC) but lend in different states. When investigating how these relative growth rates are related to local balance sheets, measured as state level personal income gaps, I am therefore able to control for the lending constraints that originate from the supply side of credit markets. Of course, the assumption here is that internal markets are functioning effectively (see the discussion below) and thus supply side restrictions are equally binding for sister subsidiaries. To measure the sensitivity to BHC balance sheets, I conversely compare the loan growth rates of banks that have different parent BHC but are located in the same state. When investigating the relationship between these relative growth rates and BHC balance sheet ratios (e.g. the equity ratio in the baseline estimation) then, I am, similarly, able to control for the strength of borrower balance sheets.

The baseline results clearly demonstrate two aspects of lending. The larger banks' sensitivity to their own and their borrowers' balance sheets is considerably larger than the small banks' sensitivities and the sensitivity to borrower balance sheets are much larger in magnitude and more economically significant compared to the sensitivity to BHC balance sheets. These results, robust to using different specifications, suggest that shock propagation and amplification through balance sheets may be stronger for large banks.

I test this prediction, as a second step, by comparing the lending responses of large and small banks to various macroeconomic shocks. I begin by identifying 9 time series of shocks in the U.S. economy. To do so, I estimate, by using a Bayesian methodology, the New Keynesian DSGE model of [Smets and Wouters \(2007\)](#) (embedded with the financial accelerator mechanism in [Gilchrist et al., 2009](#) to measure the responses of banking-industry/financial shocks). Estimated New Keynesian DSGE models have become a widely-used policy analysis and forecasting tool for central banks and they are, therefore, reasonably useful for identifying macroeconomic shocks in the U.S. economy. After identifying the shocks, I proceed by including them in the empirical model by interacting them with the balance sheet variables to measure their effects on the banks' lending. The results indicate that while different types of

¹ [Bernanke \(2007\)](#) and [Bernanke and Gertler \(1995\)](#) offer a more detailed description of the credit channel theory of monetary policy transmission.

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