Research Report

How did Banks' Problems spill over to the Real Sector? A preliminary Analysis

THE PRESENT ARTICLE TRIES TO DEMYSTIFY THE LINK BETWEEN THE SUBPRIME BANKING CRISIS AND THE SUBSEQUENT FALL IN GROSS DOMESTIC PRODUCT. AN UP-TO-DATE REVIEW OF THE LITERATURE ON THE REAL CONSEQUENCES OF THE LOSS OF BANK LENDING CAPACITY IS PROVIDED, PRESENTING EVIDENCE OF A DECLINE IN NEW BANK LOANS ALONG WITH EVIDENCE OF CORPORATE REACTIONS TO THIS DECLINE. FINALLY, IT IS SHOWN HOW THE PRESENTED FACTS CAN ADD UP TO AN EVENT OF MACROECONOMIC DIMENSION.

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Introduction

If one follows the popular press and public debates over the last two years, the impression comes up that the emergence of the current banking crisis is better understood than how problems of the banking sector spread to the macro-economy. Against this background, a careful description of the operation mode and necessity of the banking sector is provided, and it will then be shown how stress in the banking sector can spill over to the real sector.

The Key Mechanism: Costly external Finance

In a world where the renowned Modigliani Miller theorems hold, a crisis like the current one could hardly have emerged. The Modigliani Miller theorems state that the business activities of a firm are independent of the firm's financial structure and its sources of financing. Particularly, all sources of financing are equally attractive and external financing (IPOs, seasoned offerings, bond placements and bank loans) is considered costless, because the conditions are 'fair'. In such a world, banks are not very important for corporate finance, and all profitable investment projects are carried out. However, research over the last half century presented evidence of the existence of a so called pecking order of financing. "Pecking order" simply means that companies consider internal funds cheaper than external financing. External finance is costly and firms are sometimes unwilling to raise external funds, even when these funds could alternatively be used for profitable investment projects. Companies particularly dislike issuing equity. Explaining the reasons for the pecking order is beyond the scope of this article, but they are generally assumed to be driven by asymmetric information. Information is asymmetric in the sense that the management of a firm, acting in the interest of current shareholders, possesses superior information about risk, value and quality of the company and its investment prospects compared to potential external investors. One way to overcome asymmetric information is to produce information. Producing information includes conducting interviews with company representatives, collecting data, visiting factories and analyzing sector information. But information production is costly and is often only conducted when a long term relationship to the borrower exists or is being established, so that information produced once can be used for several consecutive loans. If a corporate uses a close long-term relation to a bank, it might pay off for the bank to acquire extensive information about the corporate and to grant loans that banks without such information would not be willing to grant. If this so called relationship lender suffers from a shortage of capital and reduces lending, a corporate could be rejected a loan and could therefore be forced to forego a beneficial expenditure. Lending from the relationship lender cannot easily be substituted by other sources of financing, because the relationship lender has proprietary information about the prospective borrower.

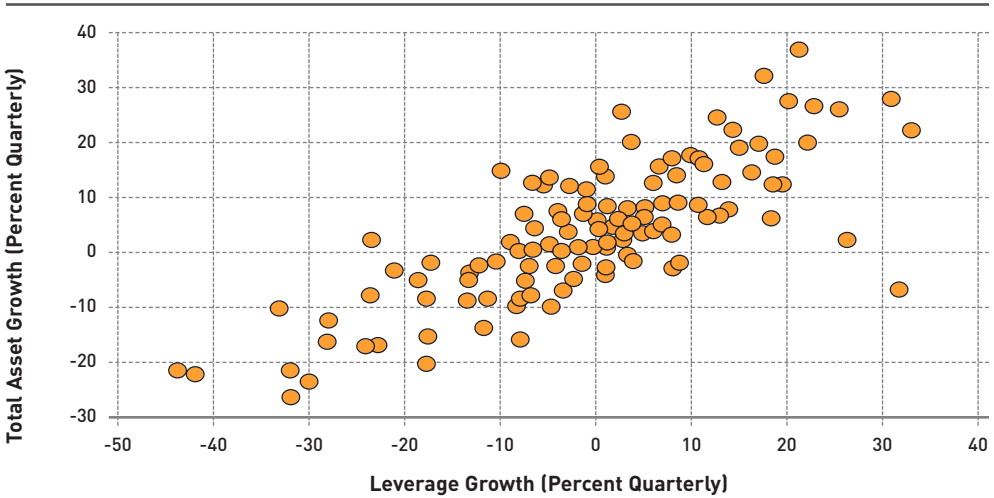

Figure 1: Changes of financial leverage of banks in times of declining asset values (Adrian and Shin, 2008). The graph shows procyclical leverage.

The Effects of the Subprime Crisis on Banks

Causes of the problems that banks had in the last two and a half years have been well explained and well understood, e.g. tremendous capital shocks on the asset side followed by run-like problems on the liability side of the

balance sheet (Acharya and Schnabl, 2009). The most important consequence of these events is that banks lost a lot of capital and had difficulties in raising necessary funds. However, the details of the problems of banks shall not be subject of this article.

It will be taken as given that bank capital was in very short supply and the financial condition of banks was largely opaque to potential external investors. Banks, due to the reasons explained above, were unwilling to raise equity. And since banks need a certain amount of bank capital to comply with regulatory rules, they cannot simply replace equity by debt. A situation in which banks are rationing credit because they are short of capital is often called a credit crunch. Consequentially, not all corporates can refer to their relationship lender to fund investments. Such firms can react by using other sources of financing, which is problematic for the reasons mentioned above, or by reducing expenditures. There are two strands of evidence for the presented idea of a credit crunch caused by a loss of bank capital. Evidence of a reduction in bank lending and reactions of the corporate sector will be described.

Bank Lending during the Crisis

The literature recognizes three reasons for the decline in bank lending capacity since the beginning of the crisis in 2007. First, assets held by banks suffered from severe price reductions, causing massive writedowns by banks. Second, in times of financial instability, certain banks usually deleverage. Figure 1 shows that in recent episodes of financial instability, leverage was reduced strongly (Adrian and Shin, 2008). A reduction of leverage with rigid capital results in a reduction of assets. Third, before the financial crisis, many banks held assets via off-balance-sheet entities such as conduits. Typically, banks provided liquidity or credit enhancement for their conduits and received the spread between the return on the assets held by the conduit and the interest on the asset-backed commercial paper issued by the conduit. The provision of liquidity or credit enhancement *de facto* means that the sponsoring bank insures the asset-backed commercial paper investors against credit risk and other risks of a conduit. One advantage of conduits over direct holding of the respective assets from a bank's perspective is the lower capital requirement of off-balance-sheet asset holding through conduits. After investor confidence eroded and conduits were no longer able to roll over asset-backed commercial paper, many banks took the assets of the conduits back on their own balance sheets or conduits tapped credit lines from their sponsoring banks (Acharya and Schnabl, 2009). This bound already scarce bank capital. None of the three developments described above would have been a problem if banks had been willing to raise sufficient external equity. However, banks seemingly were unwilling to do so. The alternative was to reduce assets, which normally implies a reduction of loans. The problem was magnified by the enormous leverage of US banks at the onset of the crisis, so any Dollar of lost or additionally bound capital resulted in many Dollars of asset reduction if the Dollar was not raised as external equity. Researchers extrapolated losses of USD 250 billion of US banks, which seems to be a rather modest amount in the review, to a total contraction of lending to the real sector of around USD one trillion (Greenlaw et al., 2008). Further calculations suggest that such a contraction of lending could be responsible for a substantial contraction of gross domestic product (Greenlaw et al., 2008). In addition, figure 2 documents a substantial decrease in new bank lending of US banks in September to November 2008 compared to the peak period in 2007 (Ivashina and Scharfstein, 2009).

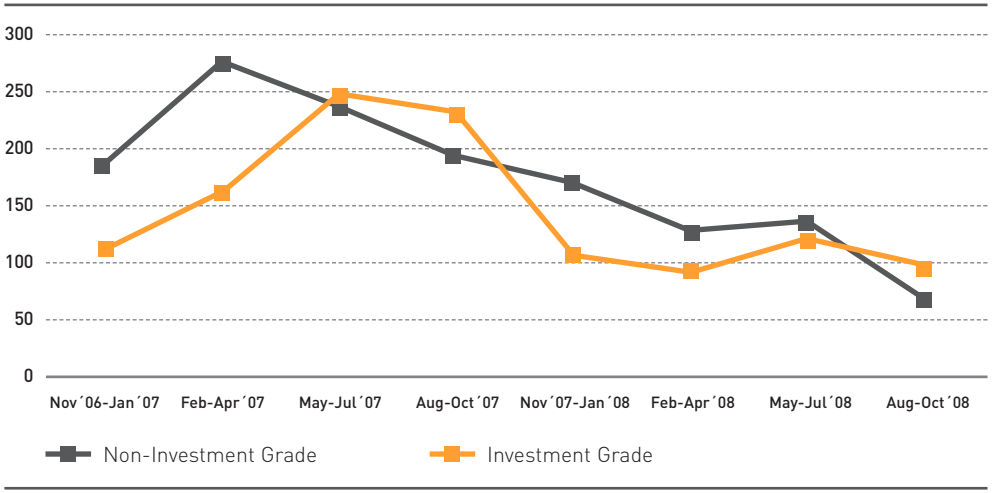

Figure 2: Development of new bank loans (in USD billions) during the crisis (Ivashina and Scharfstein, 2009).

Evidence from the real Sector

The analysis of bank lending will now be supplemented by an investigation of borrower behavior. First, firms which suffered particularly after the onset of the crisis are fundamentally different from firms which suffered most from the terrorist attacks of 9/11 (Tong and Wei, 2008). Firms, which suffered particularly in the four weeks following 9/11 (labeled 'Sensitivity' in figure 3), are assumed to depend strongly on consumer confidence, because the 9/11 terrorist attacks raised concerns about the future economic development and political stability, while difficulties in getting credit did not play a role during this period. Furthermore, Tong and Wei identify firms which were characterized by difficulties to obtain credit before the crisis began (labeled 'Constraint' in figure 3). Then, they compare the stock price development of these two groups after 9/11 and after August 9th 2007, when a serious escalation of the banking crisis occurred. While after 9/11, stocks of firms, that depend on consumer confidence, declined more than stocks of credit constrained firms, the opposite was observed following August 9th 2007 (see figure 3). This is evidence for the view that difficulties in obtaining

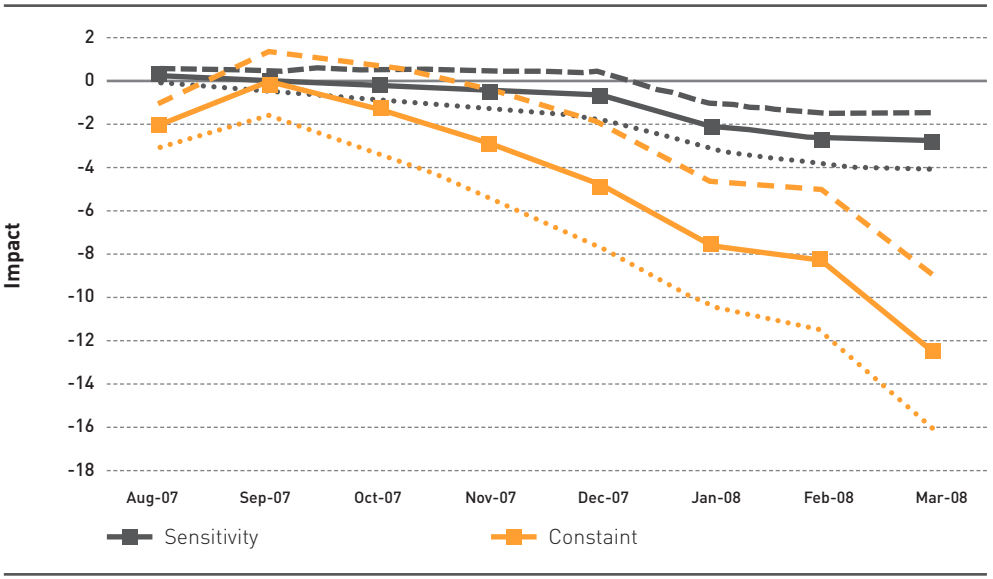

Figure 3: Effect of the subprime crisis on stock prices of firms that are credit constrained ('Constraint') or that depend on consumer confidence ('Sensitivity') (Tong and Wei, 2008)

credit are the driving force behind the current economic decline.

Second, firms which had little cash in mid 2006 reduced investment from the period mid-2006 – mid-2007 to mid-2007 – mid-2008 more than otherwise comparable firms with more cash (Duchin et al., 2009). This difference could not be detected in normal times when credit was easily available. The explanation is that in normal times, firms, which have little cash, are financing their investments externally with loans and therefore show investment behavior similar to otherwise identical cash rich firms. In times of a credit crunch, credit is difficult to obtain and firms with little cash have to cut their investments. Third, otherwise similar firms, which only differ in terms of the maturity of their debt, exhibited different investment behavior in the crisis, while such a difference could not be discovered in normal times (Almeida et al., 2009). Firms, with debt maturing right at the onset of the current crisis, reduced investment by 2.5 percent more than otherwise similar firms with a longer duration until debt maturity. The interpretation is straightforward: when banks cut lending, firms depending on lending are hurt a lot more than firms with sufficient internal funds. So some firms' debt is not rolled over in times of a credit crunch and these firms react by a reduction of investment. The fourth type of evidence comes from a global survey of CFOs of large companies. Firms with CFOs who reported to be credit constrained reduced capital spending, employment and planned R&D expenditures substantially more than comparable firms with CFOs who reported not to be credit constrained (Campello et al., 2009). Furthermore, such firms used existing cash and drew credit lines to make up for their difficulties in obtaining external finance. In addition, credit constrained firms far more often reported to forego profitable investment projects.

The presented evidence from exploring bank and corporate data suggests that corporate investment is important in explaining the downturn in gross domestic product. Indeed, macroeconomic statistics show aggregate investment was reduced by about 4 percent in the US between mid-2007 and mid-2008, a number that is consistent with the micro evidence presented above.

Conclusion

The analysis at hand explains how frictions in the corporate financing process can result in a credit crunch. In a world without financial frictions (where the Modigliani Miller theorems hold), it seems implausible that macroeconomic stress could originate in the banking sector.

Layer II of the E-Finance Lab is currently investigating how the relationship to a particular bank influenced the development of a firm during the crisis.

The analysis is preliminary and much more research will discuss the current crisis. However, the key mechanism explained in this article will certainly play a prominent role in further discussions.

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