

The subprime crisis effects on the financing of SMEs in the US

BOUBERGUIG Hadj Abdelkader¹

PHD student
TLEMCEM University
hbouberguig@gmail.com

TCHIKO Faouzi

Professor
MASCARA University
tchikofaouzi@univ-mascara.dz

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Abstract :

This paper aims to determine the effects of the Subprime crisis on the financing of SMEs. We want to see whether the decline in funding caused by the recent crisis has affected SMEs and large companies. We will observe that the level of bank lending in US lending to SMEs has increased fourfold compared to large companies after the 2008 crisis. We can conclude that the subprime crisis has had a positive effect on SMEs, which contradicts the idea that the crisis always has adverse consequences on economic activity. We can explain the increase in bank loans to SMEs by good confidence of these banks for small business and the decline of these loans to large companies by poor confidence. Finally, we can say that SMEs are favored over large firms and gain competitiveness after the crisis.

Keywords: Crisis, Bank loan, Small business, US lending, Effects of the crisis

Jel Classification Codes: G150, G140

Introduction :

The current financial crisis is significant once a century. The economic consequences are disastrous, and only the crisis of 1929 allows us to have elements of comparison. If banks are at the root of the crisis, they also play a predominant role in its spread and intensification. As a result of the subprime crisis, the first worrying signs of which were recorded at the beginning of 2007, the banking crisis culminated on September 15 with the bankruptcy of Lehman Brothers. From that date, the crisis took on another dimension, and from a banking crisis, we moved to a global financial crisis with unprecedented economic and social effects since the Second World War.

¹ **Corresponding Author** Hadj Abdelkader BOUBERGUIG. E-mail : hbouberguig@gmail.com

The crisis lasted because it now concerns the whole of the credits and not only the narrow framework of the American mortgages at risk. All types of credits that have been securitized are now affected. It has affected all the financial players who have invested, via securitization, in the credit markets (banks, hedge funds, insurers, pension funds, mutual funds, etc.). Moreover, the crisis is reinforcing the feeling of distrust that persists in the interbank markets. In these conditions, banks are reluctant to lend money to each other, worried about the possibility of recovering their funds. This paralysis of the money market influences the whole financial system.

SMEs represent an important segment of all economies and are a significant source of employment, innovation and growth. While many of them can make productive use of the funds made available to them, in reality, access to these funds is often denied, which constitutes a brake on the creation, survival and growth.

In the context of the financial crisis, several factors are oriented towards the unavailability of loans to SMEs. We can cite a more pronounced risk aversion, lower liquidity and a gloomy prospect of economic Growth. Small businesses are particularly vulnerable. They can not reduce their size because they are already small. They are taken individually and are less diversified from the point of view of their economic activities. Their financial structure is less solid, and their capitalization is lower. From the point of view of credit risk, their rating is lower. They are highly dependent on credit. They have fewer financing options, mainly because of their limited access to financial markets.

SMEs suffered more severely from credit restriction between 2007 and 2010 than large firms, say OECD experts who publish the first report on "Financing SMEs and Entrepreneurs"² by sifting through data from 18 countries ranging from Canada to Sweden, including South Korea, France, Hungary, Finland and the United States. SMEs suffered severely from the crisis in 2008 and 2009. The confidence indices of SMEs in OECD countries fell to lower levels than in the 1990s. As a direct result of the fall in demand from In mid-2008, SMEs suffered a decline in their turnover. Exporting companies have suffered even more than those living on their national market due to the decline in world trade.

There is a very abundant literature review related to the financing of companies by bank loans. But those studying the impact of the 2007 crisis on SME financing are not numerous. We try to tap into Wendt (1947), Peek and Rosengren (1998), Berger and Udell (2004), Ouand Williams (2009), Ivashina and Scharfstein (2010), Kwan (2010), Li (2011), Black and Hazelwood (2011), Duchinand Sosyura (2012), Cornett *et al.* (2011).

In our study, we will use the database of the Federal Deposit Insurance Corporation 2016, and we must perform three levels of analysis to achieve the objective of our study. These three analyses cover 432176 observations on the banking markets that we obtained from this database.

²OCDE (2016), "Financing SMEs and Entrepreneurs 2016: An OECD Scoreboard", Editions OCDE, Paris.

Our research attempts to understand the effect of the recent crisis on the financing of SMEs by bank loans. We take the US as a case study for two reasons. The first reason is that the crisis triggered in US, and the second reason is the availability of data on credits granted by US banks.

1- The theoretical frame :

The question of the availability of credit for small businesses has been studied by economists for at least sixty years, at least going back to Wendt (1947), which examines the availability of small business loans in California³. Since then, several articles have addressed this issue.

We limit our review of the literature to studies that link with the role of the bank in the granting of bank loans to finance SMEs in recent years. We are particularly interested in the studies that have led to banks' financing of SMEs because these studies have a direct relationship with our research⁴.

Among the most pertinent studies are Peek and Rosengren (1998), who examined the impact of bank mergers on small business loans⁵. This study examined the change in small business lending by groups of banks subject to different "treatments", particularly in a merger. In their study, the treatment in the case of the bank that participated in a merger is identical in the financial crisis. The bank's participation in a merger means that the bank has a problem. At the same time, the financial crisis is forcing the bank to have a rescue plan. This study considers that in about half of the mergers, small business loans increase in the period immediately following the merger.

Another study related to our research of Berger and Udell (2004) examined the change in bank loans, face the hypothesis of "institutional memory"⁶. They determinate a database on banks over 20 years, from 1980 to 2000. They calculated the annual change in commercial loan amounts that they use as their main variable. They regress this dependent variable against a set of explanatory variables to measure "institutional memory" (their main variable of interest) and measure the health of the bank and the overall loan demand. Berger and Udell (2004) do not examine small business lending or the impact of the recent financial crisis on bank lending.

Ou and Williams (2009) use data from various sources, including FFIEC⁷ data, for information on small business loans to financial institutions over the past decade⁸.

³Wendt, P. (1947), "The availability of capital to small businesses in California", *The Journal of Finance* 2 (2), 43-54.

⁴There is also a theoretical corpus on the availability of credit, which is based on data from small business surveys. For example, Petersen and Rajan (1994) ; Berger and Udell (1995, 1996, 1998) ; Cole (1998, 2008, 2009, 2010) ; Goldberg and White (2004).

⁵Peek, J., Rosengren, E. (1998), " Bank consolidation and small business lending: It's not just bank size that matters", *Journal of Banking and Finance* 22, 799-819.

⁶Berger, A., Udell, G. (2004), "The institutional memory hypothesis and the pro-cyclicality of bank lending behavior", *Journal of Financial Intermediation* 13, 458 – 495.

⁷Federal Financial Institutions Examination Council's

They used these data from 1995 to 2007 on loans to small businesses by deposit-taking institutions to see the evolution of this type of credit and understand the growing importance of loans for businesses.

Another recent study by Ivashina and Sharfstein (2010) examines the impact of the recent financial crisis on bank lending⁹. They use data on Deal Scan¹⁰ loans to analyze large syndicated bank credit markets. They want to know if the banks are suffering from the contagion following the failure of the bank Lehman Brothers. They studied whether these banks have their loans. Our study is complementary to that of this study except that they cover the large syndicated loans that are often securitized and do not appear on banks' balance sheets. At the same time, we cover smaller non-syndicated loans that are not securitized but remain on the balance sheets of bank lenders.

Kwan (2010) examine the financial crisis and bank lending¹¹but does so by analyzing changes in rates on commercial and industrial loans, using data from the Federal Reserve and Survey of Terms of Bank Lending "STBL"¹². Our study can be considered as complement to the Kwan because he examines the effect of price while analyzing the quantitative effects of the financial crisis. More this study does not focus on bank loans for SMEs.

Also, Li (2011) examines how the financial crisis affected bank lending¹³, but only by banks that participated in the Capital Purchase Program¹⁴. This study found that the CPP helped increase bank lending to capital constrained banks by 6.41% per year. Our study did not consider the banks that participated in the CPP, but we focus on small business loans rather than total loans.

Black and Hazelwood (2011) examine the impact of TARP¹⁵ on bank lending¹⁶. They used data from the Federal Reserve Survey and SBTL. Their study analyses

⁸Ou, C. and Williams V. (2009), "Lending to small businesses by financial institutions in the United States". Small Business in Focus: Finance. A compendium of research by the Small Business Administration Office of Advocacy, 9-38

⁹Ivashina V. and Scharfstein D. (2010), "Bank lending during the financial crisis of 2008", Journal of Financial Economics 97, 319-338.

¹⁰Historical information on the terms and conditions of deals in the global commercial loan market. Provides access to Thomson Reuters LPC's database of detailed terms and conditions on over 200,000 loan transactions, which finance M&A activity, working capital needs, and other general corporate purposes for loan participants worldwide. DealScan sources include regulatory filings, bank submissions, and journalist contributions.

¹¹Kwan, S. (2010), «Financial Crisis and Bank Lending", Federal Reserve Bank of San Francisco working paper.

¹²The STBL covers loans from a group of 340 banks made up of most of the largest banks and a random sample of banks.

¹³ Li L. (2011), «TARP Funds Distribution and Bank Loan Supply", Boston College working paper.

¹⁴A program sponsored by the U.S. Treasury designed to provide new capital to banks, which will in turn allow them to loan more money to businesses and thus stimulate the economy. Under this program, the U.S. Treasury will purchase up to \$250 billion of senior preferred shares of qualifying U.S. banks and savings institutions. Subscribing banks must be willing to sell an amount of stock equal to 1-3% of their risk-weighted assets.

¹⁵ TARP is a program established by the US Treasury to help stabilize the US financial system, restart economic growth and prevent avoidable foreclosures.

the risk ratings of individual commercial loans that stem from the crisis. They estimate that the level of risk has increased for the leading banks and decreased for small TARP banks, while loans, in general, have decreased.

Duchin and Sosyura (2012) also analyse the effect of the CPP on bank loans and risks Taken. They used data on individual mortgage applications¹⁷. They find that the TARP banks and non-TARP banks have similar characteristics. But, TARP banks have increased the risk of their loans compared to non-TARP banks. They also found similar results for large syndicated loans companies.

Cornett *and al.* (2011) how the financial crisis affected bank lending, emphasizing emphasizing liquidity risk management¹⁸. They find that banks that hold more illiquid assets from sources other than core deposits and equity have reduced loans more than other banks to increase their liquidity.

2-The empirical study:

2.1. Data:

To conduct our study, we use data from two sources: FFIEC and FDIC. The first source is the quarterly financial reports of the incomes and conditions of FFIEC, which are filed by each commercial bank in the United States, which are known to bank researchers as call reports.

The Federal Financial Institution Review Board (FFIEC) is an inter-agency organization that collects periodic financial information from the Federal Reserve System (FRS), the Federal Reserve System (FDIC) and the Office of the Comptroller of the Currency (OCC).

The second source is the database of the Federal Deposit Insurance Corporation 2016. The Federal Deposit Insurance Corporation (FDIC) is the U.S. corporation insuring deposits in the United States against bank failure. The FDIC was created in 1933 to maintain public confidence and encourage stability in the financial system by promoting sound banking practices.

2.2. Methodology:

We must perform three levels of analysis to achieve the objective of our study. These three analyses cover 432176 observations on the banking markets that we obtained from this database.

The first analysis focuses on studying the evolution of the credits granted by American banks to SMEs after and before the crisis. We also the two components of total small-business loans separately the two components of total small-business loans the two components of total small-business loans: commercial and industrial loans and agricultural loans separately. We want to know if the level of credits has fallen and to determine the variation in bank financing to see the impact of the crisis on the financing of all businesses.

¹⁶ Black L. and Hazelwood L. (2011), «The Effect of TARP on Bank Risk-Taking», Board of Governors of the Federal Reserve System International Finance Discussion Paper n° 1043.

¹⁷Duchin R. and Sosyura D. (2012), "Safer Ratios, Riskier Portfolios: Banks' Response to Government Aid", University of Michigan Ross School of Business working paper n° 1165.

¹⁸Cornett M., McNutt J., Strahan P. and Tehranian H. (2011), "Liquidity risk management and credit supply in the financial crisis". *Journal of Financial Economics* 101, 297-312.

The second analysis examines the credits granted by US banks to SMEs in industry and SMEs in farms versus credits granted to large companies. This multivariate analysis allows seeing which companies are more or less affected

The last analysis focuses on the relationship between bank loans granted and the size of banks. We want to know what type of banks has granted credits and which ones have fringed bank financing to SMEs. We want to confirm is that the banks that grant credit to SMEs have been affected by the crisis or banks that have not been hit.

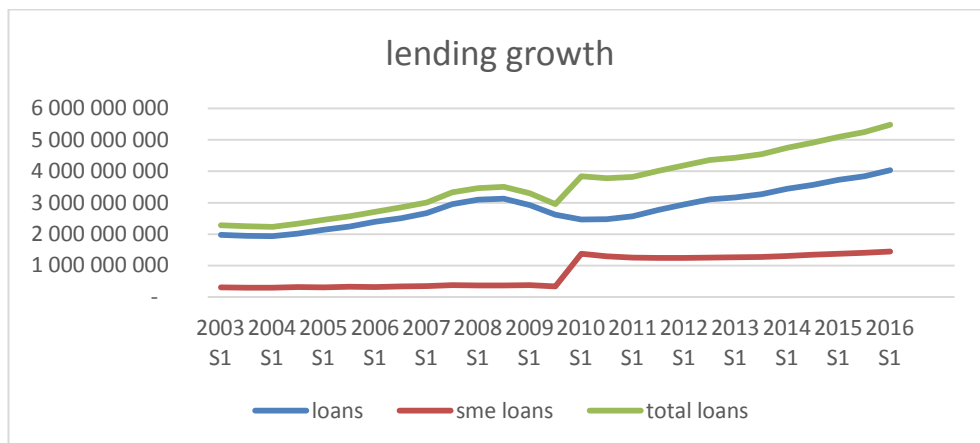
In order to conduct the three analysis, we do univariate tests for the first level of analysis and multivariate testing for both of the analysis using a series of ordinary-least-squares regressions method.

Our general model takes the form:

$$Sme\ loans_i, t = \beta_0 + \beta_1 \times Controls\ i, t - 1 + e_i, t$$

Where *Sme loans_{i, t}* is one of three measures of small business loans. First, “var sme loans” is the semi Annual Percentage Change in the Dollar Value of Loans from period *t-1* to period *t*, then, “var sme loans to assets” is the semi Annual Percentage Change in the Ratio of Bank Loans to Total Assets. Finally, “ln sme loans” is the natural logarithm of the dollar value of loans

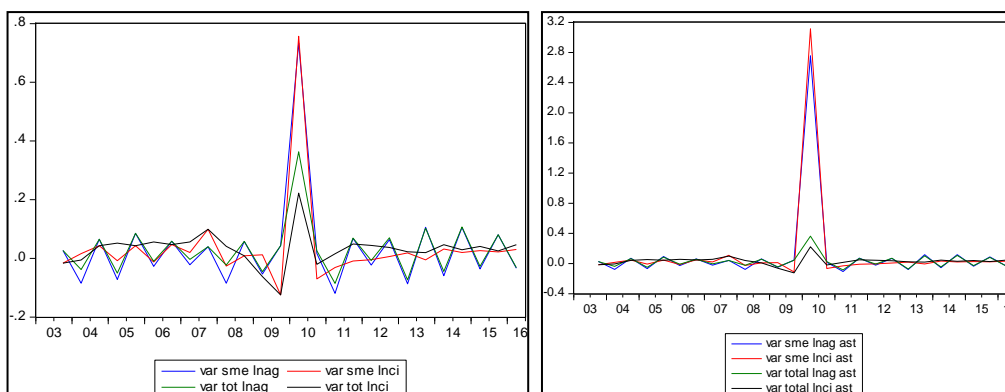
Figure 1. lending growth



Source:Quinn D.(1997),”The Correlates of changes in International Financial Regulation”,American Political Science Review,vol,91,p531

We observe that bank lending in US lending to SMEs had increased and has increased fourfold compared to large companies after the 2008 crisis especially since S2 2009, and levelled off when total lending declined largely before increasing again

Figure 2. var lending growth



Source:Quinn D.(1997),”The Correlates of changes in International Financial Regulation”,American Political Science Review,vol,91,p531

The most important variations during crisis period are positive that proves that crisis have a positive impact on SME lending

Appendix 1 presents the results of semi-annual percentage change in lending, semi-annual change in the ratio of loans to assets, and the natural logarithm of loans regressions analysis. Each table presents results from a series of six regressions where the dependent variables are (1) commercial and industrial sme loans , (2) agricultural sme loans , (3) total sme loans , (4) total commercial and industrial loans , (5) total agricultural loans (6) all loans. Each model includes a set of control variables measures as of the previous half-year

The results of the first analysis indicate that the variation of sme loans is negatively related to total loans and equity especially for agricultural loans that proves that small lending increased during crisis period when total equity and total loans fall, the coefficient of these controls variables is insignificant for total lending

The second analysis confirm the results of the first one, but the third analysis indicates that the net income is positively related and more or less significant in sme lending compared to other loans

Appendix 2 presents the results of the natural logarithm of loans regressions analysis with bank size fixed (bank assets) on five levels (1) 0- 100 k dollars (2) 100- 200 k dollars (3) 200-500 k dollars (4) 500 – 2 000 k dollars (5) more than 2000 k dollars

The results indicate that the total equity coefficient increased for sme lending. As the size bank increased, loans effect is the most negatively significant for median banks. It decreases for very large and small banks. The net income has a negative effect coefficient for medium banks size and a positive effect for large and small ones. Finally, total assets have an insignificant positive or negative effect on sme lending.

We can conclude that the subprime crisis has had a positive effect on SMEs, which contradicts the idea that the crisis always has adverse consequences on economic activity. We can explain the increase in bank loans to SMEs by good confidence of these banks for small business and the decline of these loans to large companies by poor confidence. Finally, we can say that SMEs are favored over large firms and gain competitiveness after the crisis.

Conclusion:

The article aims to show that the effect of the 2007 crisis is not negative for SMEs because the volume of US bank loans has not been reduced, and even we want to show an increase in bank loans to SMEs. We can explain this increase by a reasonable confidence of these banks for small businesses. On the other hand, we observe that bank lending to large firms has declined due to poor confidence. Finally, it can be said that SMEs are favoured over large companies and become more competitive after the crisis.

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Appendix:

Descriptive Statistics for Full Sample

Variables	Median	mean	Max	min
dependent variables				
Varsmelnci	0,0141275	0,0344045	0,7569584	- 0,1244693
Varsmelnag	0,0220198	0,0326836	0,7337754	- 0,1193277
Varsmeloans	0,0103649	0,0344509	0,7548319	- 0,1077689
Vartotlnci	0,0407751	0,0313774	0,2223380	- 0,1244693
Vartotlnag	0,0265020	0,0290923	0,3633183	- 0,0854258
Vartotloans	0,0388219	0,0313908	0,2311598	- 0,1157807
varsmelnciast	0,0143332	0,1267183	3,1145215	- 0,1106916
varsmelnagast	0,0225420	0,1148282	2,7562265	- 0,1066066
varsmeloansast	0,0104767	0,1252851	3,0788348	- 0,0972847
var total lnciast	0,0407751	0,0313774	0,2223380	- 0,1244693
var total lnagast	0,0265020	0,0290923	0,3633183	- 0,0854258
var total loansast	0,0388219	0,0313908	0,2311598	- 0,1157807
Lnsmelnci	19,6554937	20,1814715	20,9886983	19,3989009
Lnsmelnag	17,3610227	17,9612797	18,8048852	17,2202175
Lnsme	19,7515443	20,2847333	21,0921286	19,5149331

In total Inci	21,9316362	21,9160368	22,3685297	21,4712940
In total Inag	18,8473459	19,0469409	19,5450140	18,6157709
In total loans	21,9763824	21,9715988	22,4245086	21,5272260
control variables				
Loansast	0,1081929	0,1075960	0,1221805	0,0927554
Eqast	0,1080008	0,1058238	0,1124417	0,0913042
Lnast	24,0098256	23,9677892	24,2204455	23,5883764
Netincast	0,0049077	0,0055690	0,0116644	- 0,0008902