The bank lending channel from the European syndicated loan market perspective

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Preliminary version

Abstract

This paper provide new empirical evidence on the bank lending transmission channel of monetary policy during the 2008 financial crisis. Using an original dataset on Euro Area syndicated loans between 2005 and 2013, we focus our attention on 7 major banks and try to explain their lending behaviour in the syndicated loan market. Using a fixed effect panel, we show a significant influence of the ECB key rate changes on banks' short term borrowings. We argue that excess liquidities in the money market weakened the importance of customer deposits in the banks' loan allotments process. Moreover, unconventional measures (proxied by the central bank balance sheet) are reducing banks' short term borrowing constraints only between 2008 and 2010 hence facilitating the credit supply of syndicated loans.

Keywords : Bank lending channel, credit supply, syndicated loan, financial crisis

JEL classification : E52, F34, G21

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1 Introduction

"*The recent credit crisis has reminded us of the crucial role performed by banks in supplying lending to the economy, especially in a situation of serious financial distress*"
L. Gambarcota and D. Marques-Ibanez[1]

In 2008, the American bank Lehman Brothers collapsed triggering one of the most, if not the most important financial crisis we have ever known. However, it is also in 2008 and more precisely on the 27th of March, before the bank failure, that the Governing Council of the ECB decided to implement its first non-standard measure consisting in one Long-Term Refinancing Operation with a maturity of 6 months. The objective was to support the functioning of the Euro money market. However, over the following years, a confidence crisis provoked a disruption in this market, forcing the ECB to intervene and to implement additional unconventional tools in order to maintain the financial stability. As such, during the crisis, the standard credit channel as studied in the literature was disturbed and the effects of the monetary policy were not as expected anymore.

In this paper, we aim at understanding how conventional and unconventional monetary policies can influence the supply of credit in the European syndicated loan market. This original approach of the bank lending channel allows us to contribute to the literature in two ways. First by studying a market which represents one of the most significant source of international financing for companies. Second by taking into account borrowers' characteristic as a way to control for credit demand. To do so, we build an original dataset which is a combination of six different databases. As such, this is one of the first papers to introduce in the estimated model specific data about the borrower such as its financial

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[1]Gambacorta & Marques-Ibanez (2011)

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position, its relationship with the lender, its geographical position, etc. The objective is to get precise and accurate information for all parties involved in syndicated loans as well as data on the European monetary policy measures and the economic context.

The estimation of a fixed effect panel for seven European banks highlights a significant impact of both standard and non-standard monetary policy decisions. First we show that an accommodative interest rate decreases the restriction imposed by the previously held short term borrowings. As interest rates are low, banks can easily obtain liquidities at a reduced cost. Second, unconventional measures are able to support banks' lending activities by reducing the constraints on banks' short term borrowings.

The paper is organized as follow : Section 2 provides a literature review on both the bank lending channel and the impact of monetary policy decisions on the syndicated loan market. Section 3 presents the model we are using and our dataset while we discuss our results in Section 4.

2   Literature Review

As described by Bernanke & Blinder (1988), the credit channel of monetary policy can be decomposed into two transmission schematics. First the *balance sheet channel* (or broad credit channel) explains the reaction of borrowers' balance sheet and income to changes of the monetary policy stance. Second, the *bank lending channel* focuses on the supply of credit to non-financial institutions. As there is no costless alternative to reservable deposists (Kashyap & Stein (1995) and Kashyap & Stein (2000)), banks will decrease their lending as a contractionary monetary policy will reduce households deposits or their willingness to hold deposits (Ehrmann et al. (2003)).

A large number of empirical studies in different geographic areas attempt to explain the impact of monetary policy changes on credit supply. The ability to obtain external funds Campello (2002)) among others) and its cost (external finance premium, Disyatat (2011)) are related to market participants expectations on the bank riskiness and its characteristics (i.e. size, balance sheet liquidity, capitalization and credit risk). Smaller banks have more dofficulties to get access to alternative funding sources (among others, Kashyap & Stein (1995), Kishan & Opiela (2000)). A liquid bank will be more able to compensate the loss of deposits at a lower cost than an illiquid one (Kashyap & Stein (1995), Gambacorta (2005)) and bank capitalization influences market participants risk assessment of the bank influencing bank's ability to access external finance (Kishan & Opiela (2000), Altunbas et al. (2002), Gambacorta & Marques-Ibanez (2011)). A recent analysis from Cantero-Saiz et al. (2014) provides empirical results confirming the relation between sovereign risk and banks' ability to access funding. They argue that sovereign risk must be considered to explain the bank lending channel.

More recent analyses from Jimenez et al. (2014) and Paligorova & Santos (2012) highlight that the monetary policy has an impact not only on the quantity of credit distributed by banks but also on their quality. In a period of low interest rate, asset managers will be willing to take more risk (Gambacorta (2009)). The so called *risk taking channel* focuses on this relation between policy rates and banks risk perception and/or tolerance (see Borio & Zhu (2012) for a more extensive literature review).

Building on this idea, we focus our analysis of the bank lending channel on the relationship between the monetary policy, bank's liquidity constraints and loans provided to the rest of the economy. More precisely, we aim at understanding if and how bank credit supply

of syndicated loans[2] is affected by the implementation of both standard and non-standard measures of the monetary policy, indirectly through the banks' ability to borrow from Central Banks.

By focusing on the supply of syndicated loans, we contribute to the literature on the bank lending channel as it is one of the first papers to study the impact of the monetary policy on this specific category of loans. This market is an important source of corporate finance in which commercial banks are the main players[3]. It represents one third of the international financing which gathers together not only syndicated loans but also commercial paper, bond and equity issues (Gadanecz (2004)). Hence, a disruption in bank credit supply of syndicated loans may have dramatic consequences. As an example, Haas & Van Horen (2012a) show that, during the subprime crisis, international banks suffered from financial constraints and had to restrict the volume of syndicated loans they normally provide, especially to small borrowers. As such, these banks contributed to the transmission of the shock across borders. In addition, Haas & Van Horen (2012b) among others show that during a financial turmoil and due to confidence issues, banks tend to lend more to companies that are geographically closer as it seems easier to have information on firms' credit history and to monitor the loan (Epstein (2001)).

Then, in this paper, we assess to what extent the implementation of the monetary policy affect bank lending activities in the syndicated loan market, reshaping the international

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[2]A syndicated loan is a hybrid of bank loan and public debt, gathering together commercial banks and other financial institutions and implying both monitoring and underwriting activities (Dennis & Mullineaux (2000); Gadanecz (2004); Chaudhry & Kleimeier (2015)). The Appendix A describes in more details the syndicated loan market and its participants.

[3]At the origins, the main lenders were commercial banks. However, even if they still dominate the syndicated loan market, new financial institutions such as finance companies in addition to institutional investors such as Collateralized Loan Obligations funds (CLO), loan participation mutual funds (also known as prime funds), hedge funds, insurance companies, etc. have started to invest in syndicated loans, mainly when the risk associated to the loan is higher (Amstrong (2003); Gadanecz (2004); Miller (2011)).

distribution of loans and contributing to the transmission of financial shocks across borders.

3 Empirical Application

3.1 Model

Our methodology to evaluate the relationship between monetary policy decisions and syndicated loans volume is inspired by **?**. The authors use a two-step analysis to study the bank lending channel in the US between 1976 and 1993. In their model, they first try to estimate total volume of loans (expressed as logarithm) with the structure of the bank's balance sheet, using the ratio of securities and federal funds sold to total assets as a proxy. For the second step, they regress the previously obtained coefficient on several different monetary policy indicators including the fed funds rate.

Our approach differs in several ways. First, as our analysis focuses on the bank credit distribution process, we contribute to the literature by including additional variables which may influence the bank lending decision such as the borrowers' financial characteristics (Jimenez et al. (2014) among others) and the bank's balance-sheet transmission channel. We also focus our attention on each bank[4] short-term liabilities to specifically address possible liquidity constraints. Second, due to the size of our sample[5], we have to use a one-step regression by including directly the measures of the monetary policy tools in our equation. Third, rather than using one monetary policy indicator, we disentangle between standard and non-standard monetary policy tools.

Hence, the model we try to estimate is the following:

$$Amount_{ij} = \alpha_i + \beta Loan_j + \gamma Borrower_j + \delta Lender\_Strategy_{ij} + Lender\_Constraints_{ij} + \varepsilon_{ij} \quad (1)$$

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[4]Our analysis is not limited to loans provided by lead arrangers as we consider the bank's proper decision to lend. Hence, even if the bank is only a participant, at the beginning of the syndication process, it still has the choice to invest or not and this decision may be influenced by the implementation of the monetary policy.

[5]Our dataset only includes 4,550 observations which is not enough to use a two-step approach on a quarterly basis.

The $Lender\_Constraints_{ij}$ from equation 1 can be written as :

$$Lender\_Constraints_{ij} = \psi T1 + \nu CD + \phi OL + STB * (\eta + \lambda EONIA + \kappa ECB\_BS) \quad (2)$$

where $Amount_{ij}$ stands for the amount of loan j provided by bank i as a percentage of the total amount lent by bank i during the same quarter[6]; $Loan_j$ and $Borrower_j$ are the control variables for the characteristics of the loan and the financial position of the borrower respectively; and $Lender\_Strategy_{ij}$ and $Lender\_Constraints_{ij}$ represent the strategy and the structural and liquidity constraints of bank i respectively when loan j is granted. The measures of standard and non-standard monetary policy tools are included in $Lender\_Constraints_{ij}$. For each bank, we control for its financial constraints ($Lender\_Constraints_{ij}$) in terms of regulated capital (proxied by the $T1$ ratio, i.e. the ratio of common equity and retained earnings to risky weighted assets) (Gambacorta (2008); Acharya & Steffen (2013); Drechsler et al. (2013); Kapan & Minoiu (2013)) and liquidity position using three distinct variables which are the customer deposits (CD), the short-term borrowings (STB) and the other liabilities (OL). These variables are collected using Bloomberg, on a quarterly basis. The two variables we use to introduce both the standard and the non-standard measures of the monetary policy in our model are the $EONIA$ and the size of the ECB balance sheet (ECB_BS) respectively.

Using an Hsiao test, we confirm the use of a panel model[7]. Results from an Hausman test confirmed the selection of a panel with fixed-effects where α_i from equation 1 is the bank specific fixed effect. Because we run our analysis from 2005 to 2013, our sample period has to be decomposed into three different periods as the functioning of the overnight money

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[6]This measure allows us to estimate the size of loan j with respect to the bank lending activity for the period.

[7]As Gambacorta (2005) provide evidence of an asymmetric transmission of monetary policy among Italian banks, we do not use a panel per country but rather a panel by bank.

market was severely impaired during the 2007-2008 crisis. Hence, the pre-crisis period starts in 2005 and ends in 2008Q2, the financial crisis is between 2008Q3 and 2010Q2 and the sovereign debt crisis, between 2010Q3 and 2013Q2 (see Drudi et al. (2012) for a detailed description of the crisis in the Euro area money market).

3.2 Data

As we have mentioned above, we want to run the analysis from 2005 to 2013 to include both a normal time and crisis periods. As such, we are able not only to measure to what extent the implementation of a monetary policy can affect the credit supply provided by banks but also to assess whether this impact is different and/or more or less significant during a financial turmoil.

In this paper, we focus on one unique monetary policy, i.e. the one implemented by the ECB as other Central Banks like the Fed may have different objectives leading to different behaviors regarding the implementation of their own monetary policy[8]. The final sample of banks is then composed by seven European financial institutions which are Commerzbank, Deutsche bank, Unicredit, Intesa San Paolo, ING, BBVA and Santander, located in four Eurozone countries (Germany, Italy, Netherlands and Spain)[9].

Our hypothesis is that both measures of monetary policy $EONIA$ and ECB_BS can have an effect on credit supply through banks short-term borrowings. If the monetary policy is accommodating (tight), the interest rate will decrease (increase). As such, banks will

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[8]It would be interesting to compare the impact of two different monetary policies on credit supply but this is beyond the scope of this paper.

[9]We restrict our final sample to these seven big European banks for which we are able to get their financial data on a quarterly basis and for which we have enough observations (i.e. number of loans) per quarter.

be more (less) able to borrow money resulting in a higher (lower) capacity to lend. We expect that, with an increase in customer deposits, the bank should be able to provide more credit before requiring the use of costly external financing sources. However, if short-term borrowings in the money market go up, the bank might be more constraints by its liquidity situation and thus might decrease credit emissions. As such, as the overnight interest rate is low (accommodative monetary policy), banks should be able to borrow liquidities at a relatively low cost which should decrease short-term borrowing constraints. λ is expected to be positive. Finally, as the balance sheet of the central bank is expanding (accommodative monetary policy), we expect a decrease of the bank liquidity constraint. So κ should be negative.

To be able to isolate and estimate this relationship between the monetary policy and banks' credit supply, we need to control for all the other determinants of bank's lending decision. First, we consider the type and the risk of the project presented by the company using four loan's characteristics, namely its type, its maturity, its spread and its currency in addition to the industry the borrower belongs to ($Loan_j$). We collect this information using the Dealogic Dealscan database. Second, we control for the characteristics of the borrower ($Borrower_j$) which may influence the negotiations with the lead lender. Hence, we combine three complementary databases, i.e. Compustat, Orbis and Diane[10], to get accurate and complete information on companies' financial position, on an annual basis. From these three databases, we collect the level of total assets (TA), the ROE of the company and the ratio of fixed assets to total assets (PPE) on an annual basis. Then, in our estimations, for a loan granted at time t, we control for the financial position of the borrower at time t-1 as the bank will partly base its decision on past financial performance. Third, the

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[10]Compustat is mainly dedicated to listed and US companies while Orbis and Diane are complementary and provide information on European (not French) and French companies respectively.

literature (Giannetti & Laeven (2012) among others) highlights a significant home bias in bank credit supply especially during a financial crisis. One reason behind this behaviour is the higher ability to get information about a domestic company and to monitor the loan (Epstein (2001)). Hence, we add a dummy variable (*domestic*) to account for the fact that the borrower is located in the same country than its lender. Finally, in the syndicated loan market, the relationship that may exist between the borrower and the lead lender is highly important and may increase the probability for a company to get a loan. As such, we computed a dummy variable (*relation*) which is equal to one when the company has already borrowed from the same lead lender during the year that precedes the loan under study.

In addition, one issue with the objective of studying credit supply is to disentangle it from credit demand. In our estimations, we try to control for the opportunity to invest of the borrowing company by using the bank lending survey (BLS) conducted by the ECB. Its main objective is to provide the ECB's Governing Council with information regarding the financing conditions in the euro area, from both supply and demand perspectives. It consists in questionnaires banks as well as enterprises have to fulfill in order to give their opinion about the market appetite for loans. In our model, we use the information related to the expected demand of loans and credit lines from enterprises of all sizes[11].

Finally, our last set of variables ($Lender\_Strategy_{ij}$) is related to the lender's investment strategy as it may influence its decision to grant a credit. First, a bank may develop an expertise in one or more than one industry by being used to lending to companies that belong to this (these) industrie(s). This allows banks to save costs in terms of informa-

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[11]We also tested both the responses at a country level rather than the aggregated euro-area and the past three months change in demand for loans. They do not provide significant improvements.

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tion gathering and monitoring efforts. However, the risk of this "focus" strategy (Acharya et al. (2006)) is the lack of diversification which may sometimes push banks to lend more to companies in other industries. Hence, to account for this degree of specialization, we computed a variable LS equal to the total amount a bank has lent to companies from the same industry than the industry of the borrower under study, over the previous year[12]. Second, we also want to control for the risk of the industry which may affect bank's portfolio of loans especially during a crisis period when investors become risk-averse. As such, we use industry indices produced by Datastream to compute a VaR per industry. Then, we manually match the SIC code of the borrowing company provided by Dealogic Dealscan database with the indices provided by Datastream to associated one VaR per loan, also considering the timing of the loan.

In the Figure 1 below, you have the distribution of the sample of loans for the entire period under study. We may easily observe two huge drops in loans volumes in 2006 and 2008 respectively with 2005 as being the most productive year.

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[12]The variable which account for the lender's specialty is based on all the loans one lender granted over the previous year and for which we have data in Dealogic Dealscan database.

Figure 1: Total number of loans distributed
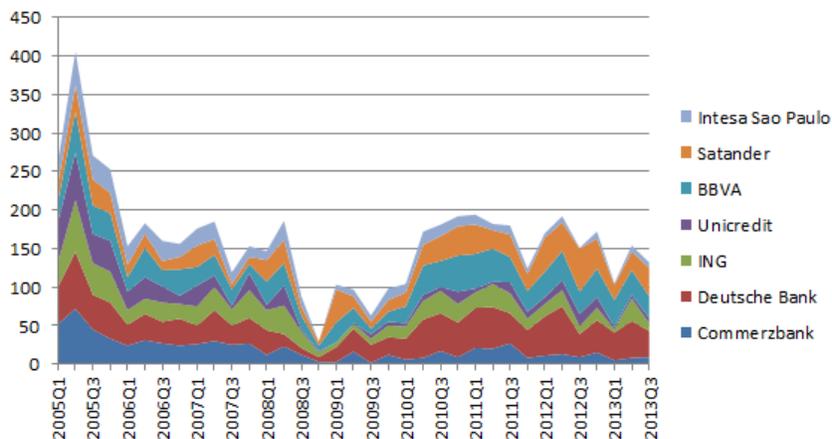
Total number of loans distributed at a quarterly frequency.
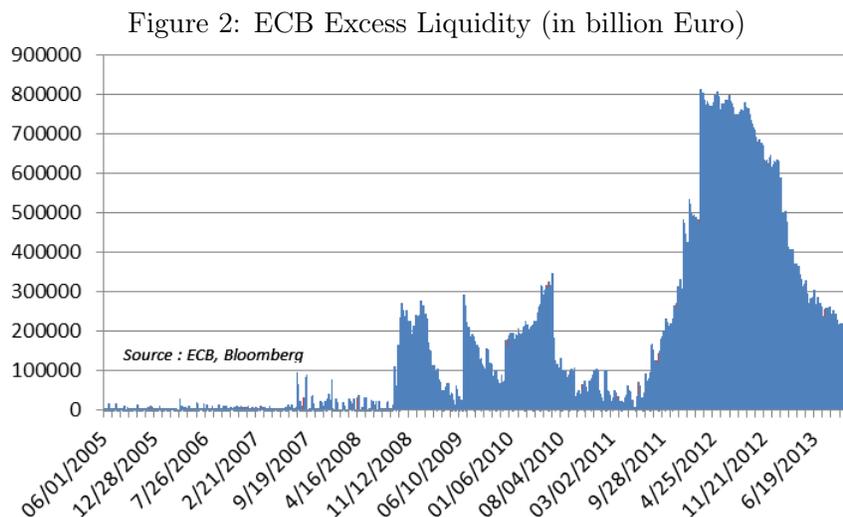
4   Results

Insert Tables 1 and 2 here.

Tables 1 and 2 provide the estimated coefficients of our fixed effects panel model.

First, we want to draw your attention to Table 1 which contains the results for our variables of interest[13]. Before the financial crisis, banks benefiting from higher level of customer deposits tended to provide syndicated loans with larger amounts. However, after the collapse of Lehman Brothers, the relationship between customer deposits and loans' amount is reversed. One potential explanation might be due to the general financial stress observed at this period : as the money market was not functioning, financial institutions were retaining liquidity as a precaution. More interestingly, between 2010Q3 and 2013Q3, we find no evidence at all of a relationship between customer deposits and syndicated loans' amounts. This result might be related to the excess liquidity available in the money market at this

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[13]As our independent variables are in levels and our dependent is a ratio of amounts, coefficients are very small. We used the scientific notation only for our variables of interest.

period. As the money market is flooded by both conventional and unconventional measures
(Figure 2 represents the ECB Excess Liquidity), and as economic uncertainty was reducing
the demand for loans, banks were no longer limited by deposits.

Figure 2: ECB Excess Liquidity (in billion Euro)

Focusing on bank's short-term borrowings, the results are as expected. When a financial
institution increases its level of short-term borrowing, the consequence is a decrease in its
lending activity. These first two conclusions about customer deposits and short-term bor-
rowings provide evidence of the existence of the bank lending channel.

Regarding the monetary policy, the EONIA is influencing bank's ability to obtain exter-
nal source of liquidities through the change in premiums. Between 2005 and 2010Q2, as
the main refinancing rate was getting more accommodative, the constraint imposed by the
short term borrowings is decreasing. During the sovereign debt crisis, the negative coeffi-
cient obtained in our estimate is troubling. But since mid-2009, the ECB Main Refinancing
Operation rate was close to the zero lower bound of interest rates and as financial uncer-
tainty and the sovereign debt crisis were striking the Euro Area, the EONIA was close

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to the Deposit facility below 70 bps. Hence, our empirical estimate suggests that during this period, a low EONIA tends to increase the negative effect of short-term borrowings on the bank's loan amount. As such, the ability of conventional monetary policy to influence bank's balance sheet appears impaired in the Euro Area at this period.

Looking at a wider indicator of the monetary policy stance, i.e. the level of the ECB balance sheet, we can observe that the coefficient is negative and significant only during the financial crisis, implying that this measure helped to reduce banks' liquidity constraints. The ECB used several unconventional monetary policy tools such as several Long-Term Refinancing Operations (LTRO), the Covered Bond Purchase Program (CBPP), the Security Markets Program (SMP) replaced in 2012 by the Outright Monetary Transactions (OMT). Such measures had two primary objectives: restoring the money market functioning and supporting credit creation via the banking system. Even if several programs were not directly targeting banks liquidity funding, it seems that they were able to restore confidence in the interbank market, allowing a higher syndicated loan distribution.

Second, we can conclude that the coefficients of our control variables are almost all in line with the literature. First, regarding loan characteristics, we highlight that for all three periods, the spread is significantly and negatively correlated to the endogenous variable. In other words, when the spread of the loan increases, the proportion of this loan with respect to all new loans granted by a bank during the same quarter decreases. A loan denominated in Euro seems to be significantly associated to a higher amount during both crises while the conclusions about maturity are less clear. The maturity is significantly and negatively correlated to the amount of the loan which is in line with the literature as a loan with a higher maturity is riskier. However, this relationship disappear and even becomes positive during the sovereign debt crisis. Second, all coefficients related to the borrower's financial

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position are not significant or close to zero. However, we are able to highlight a home bias which is highly significant during the sovereign debt crisis as the amount of one firm's loan seems to increase if it is located in the same country than the lender. In addition, a borrower which has established a relationship with its lenders seems to benefit from large amounts before the crises while the relationship is reversed and significant during both crises. On one side, this may be a signal that lenders are looking for diversification by lending more to new companies. On the other side, when one has a look at the strategy of the lender, it seems that when the lender is specialized in one specific industry, it tends to offer larger loans before crises and also during the financial crisis (positive and significant coefficients). However, this result has to be taken with cautious as the coefficients are equal to zero.

5   Conclusions and discussions

In this article, using loans involving seven European banks from the syndicated loan market, we analyse between 2005 and 2013 the relation between the ECB monetary policy, banks' short term borrowings and banks' credit. We explain with a fixed effect panel regression the ratio of the loan amount over the bank total lendings over the quarter with the loans conditions, the borrower's characteristic and the bank specific liquidity constraints. We contribute to the existing literature on the bank lending channel by focusing on bank's credit decision process. Our preliminary results imply the following. First, the decrease of customer deposits since the beginning of the financial crisis in 2008 does not appear as a restraining factor of bank credit distribution. We argue that excess liquidity in the money market quickly removed this limit for financial institutions. Second, conventional measures (money market rates) were able to influence credit emissions before and during the first stage of the crisis. However, unconventional measures from the ECB were only able to stimulate credits between 2008 and 2010. This last result questions the effectiveness of the

3 year LTRO program alloted on December 2011 and February 2012 with a total increase of liquidity of €193 billion.

This preliminary work presents so far several limits. We do not include the crossed relations between monetary policy, liquidity conditions on the money market and deposits. Using a database from italian banks, Gambacorta (2005) finds that a tightening monetary policy by 1% leads to a decrease of core deposits by 0.9%. However, Disyatat (2011), on a theoretical basis, rejects the relation between deposits and banks' loans. Also in our database, we focus our attention on seven big European banks in four countries. As our analysis provides an interesting discussion on the main loans issuers, we fail to differentiate the transmission mechanisms among different classes of banks' sizes. As the syndicated loan market is mainly used for important loans (average amount of 222 millions euros), our study cannot provide a discussion on loan to small or medium enterprises.

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Table 1: Relation between the importance of a loan's amount and lenders' characteristics.

	(1) Pre-Crisis	(2) Crisis I	(3) Crisis II
CD	1.48e-05***	-4.45e-05**	-6.96e-06
	(1.98e-06)	(2.13e-05)	(5.53e-06)
STB	-3.23e-05***	0.000309***	-2.37e-05
	(8.21e-06)	(0.000100)	(1.59e-05)
OL	-9.75e-07	-7.98e-07	-9.00e-07
	(7.22e-07)	(2.73e-06)	(1.05e-06)
T1	-0.0554	-3.830***	0.0649
	(0.281)	(0.824)	(0.188)
STB*EONIA	4.89e-06**	1.21e-05**	-2.00e-05***
	(2.01e-06)	(5.21e-06)	(6.10e-06)
STB*ECB_BS	1.20e-08	-1.57e-07***	4.90e-09
	(9.80e-09)	(4.88e-08)	(4.18e-09)
Observations	2,436	472	1,642
R-squared	0.138	0.317	0.148
Rho	0.142	0.459	0.204
F-stat	19.24	10.32	14

Results from a panel regression with 7 individuals banks as entities and fixed effects. The time period of the 3 estimates Pre-Crisis, Crisis I and Crisis II corespond respectively to 2005Q3-2008Q2, Crisis I to 2008Q3-2010Q2 and Crisis II to the period between 2010Q3 and 2013Q3. Standard errors are in parentheses. *** , ** and * represent confidence intervals of 1%, 5% and 10% respectively.

Table 2: Relation between the importance of a loan's amount and control variables.

	(1) Pre-Crisis	(2) Crisis I	(3) Crisis II
spread	-0.0169***	-0.0080*	-0.0224***
	(0.0017)	(0.0049)	(0.0020)
maturity	-0.0121***	-0.1040***	0.0205*
	(0.0043)	(0.0320)	(0.0108)
currency	-0.2440	11.0000***	1.5740***
	(0.2840)	(1.9300)	(0.5110)
type	-1.8840***	-4.2970***	-2.6410***
	(0.2510)	(1.3180)	(0.5100)
industry_manuf	-0.7590***	5.4820***	0.2060
	(0.2540)	(1.1900)	(0.4350)
industry_finance	-2.0270***	-1.0410	-1.1080*
	(0.3810)	(2.5000)	(0.6170)
TA	-0.0000***	-0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)
ROE	0.0049*	0.0010	-0.0001
	(0.0028)	(0.0010)	(0.0012)
PPE	-0.0029	-0.0072	0.0088
	(0.0048)	(0.0218)	(0.0082)
domestic	-0.1520	1.3820	2.2600***
	(0.4630)	(3.0380)	(0.8320)
relation	1.3560***	-5.0450**	-1.3710**
	(0.4590)	(2.3310)	(0.6680)
BLS	-0.0093	-0.0317	-0.0500***
	(0.0139)	(0.0679)	(0.0157)
VaR	-32.8000	1.9450	-9.9870
	(30.9600)	(59.2900)	(37.1000)
LS	0.0000***	0.0000**	0.0000
	(0.0000)	(0.0000)	(0.0000)
constant	2.8530	63.4500***	12.8800***
	(2.3630)	(12.2800)	(3.5020)
Observations	2,436	472	1,642
R-squared	0.138	0.317	0.148
Rho	0.142	0.459	0.204
F-stat	19.24	10.32	14.00

Results from a panel regression with 7 individuals banks as entities and fixed effects. The time period of the 3 estimates Pre-Crisis, Crisis I and Crisis II correspond respectively to 2005Q3-2008Q2, Crisis I to 2008Q3-2010Q2 and Crisis II to the period between 2010Q3 and 2013Q3. Standard errors are in parentheses. *** , ** and * represent confidence intervals of 1%, 5% and 10% respectively.

Appendices

A The syndicated loan market

A.1 Definitions and syndication process

A syndicated loan is a debt instrument provided to one corporation by a group of lenders (Esty & Megginson (2003); Carey & Nini (2007) among others). The market where the loan is issued determines the geographical location of this loan. It may have different forms depending on the firm's borrowing needs. As an example, to invest in a new project, a company may need to have two different loans such as one term loan to start the project that will be repaid at the end of the project and one revolver loan to benefit from liquidity, especially at the beginning of the project. Each of these two loans represents a facility also called a tranche and together they form a deal.

At the beginning of the syndication process called the pre-mandate phase, the issuer, i.e. the borrowing company, awards the mandate to the most competitive bidding made by different financial institutions (Amstrong (2003)). The selected bank then becomes the lead arranger and is entitled to structure, arrange, underwrite and administer the loan.

Then, the second step in the syndication process, named the post-mandate phase, aims at formally market the deal and invite investors to form the syndicate. Hence, the lead arranger sends them the Information Memorandum which contains the description of the issuer and its project as well as all the terms of the transaction (Dennis & Mullineaux (2000); Esty (2001); Amstrong (2003); Esty & Megginson (2003); Sufi (2007); Miller (2011); Chaudhry & Kleimeier (2015)).

Finally, when the syndicate is formed and the final agreement is reached, the loan is closed.

The post-signing phase then starts and will last for the entire life of the loan (Sufi (2007); Chaudhry & Kleimeier (2015)). However, the loan remains flexible to be revised and amended in the future with the agreement of all or some lenders depending on the type of change (Miller (2011)).

A.2 Lenders' role, rights, obligations, interest, risk and relationships

Together, the commercial banks and the institutional investors form the syndicate which can be defined as a group of lenders which have invested together in one deal. According to their role in the syndicate, all the lenders can be categorized as either lead arrangers (senior and mainly international banks) or participants (junior) (Sufi (2007)). However, beyond this division and the fact that there is only one loan agreement contract, each lender involved in a syndicated loan has a participation contract which proves that he has a separate claim on the debtor (Dennis & Mullineaux (2000); Amstrong (2003); Gadanecz (2004)). As such, all lenders, lead arrangers and participant lenders, have to monitor and evaluate the loan respectively as if they were the sole lender. Hence, the lead arranger can only be liable for bad faith and gross neglect (Preece & Mullineaux (1996); Sufi (2007)).

The syndicate is the result of banks and financial investors' decision to invest in a syndicated loan or not. On one side, the syndicated loan market provides lead arrangers with the opportunity to deepen and to reinforce their relationships with the borrower by being part of a loan it could not afford alone while diversifying the risk. In addition, these lenders earn higher fees and can diversify their revenues. On the other side, being members of the syndicate provides participant lenders with opportunities to diversify their investments in terms of geographical areas, industries, etc. at lower origination costs (Dennis & Mullineaux (2000); Esty (2001); Gadanecz (2004); Chui et al. (2010)).

Nevertheless, investing in a syndicated loan contains some risks such as agency problems (adverse selection and/or moral hazard) not only between the lead arrangers and the borrower as for a classical debt instrument but also within the syndicate, between the lead arrangers and the participant lenders. Indeed, lead arrangers may not share all the information they have about the borrower or they may be tempted not to correctly monitor the loan once it has been sold (Simons (1993); Dennis & Mullineaux (2000)). However, Sufi (2007) and Chaudhry & Kleimeier (2015) argue that some factors such as the reputation of the borrower or the lending history between the borrower and the lead arranger may help to reduce the problem of information asymmetry.

A.3 Pricing a loan

When the lead arranger is appointed by the borrowing company he has to negotiate the terms of the loan and more precisely its price. Pricing a syndicated loan mainly consists in setting up two elements: the rate and the fees[14]. A syndicated loan market is a floating-rate debt instrument whose spread is computed based on a benchmark rate (mainly the LIBOR or the EURIBOR rates) and is adjusted over time (Carey & Nini (2007)). Moreover, due to its architecture, a syndicated loan contains different types of fees paid to the lenders regarding their involvement and their role in the syndicate. In addition, to make sure that the loan syndication will be a success and to better attract potential lenders, the lead arranger has to gauge their appetite for risk to set up a loan's price that clears the market.

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[14]Additional compensations such as guarantees and collateral (especially for borrowers located in emerging countries) as well as covenants (more popular for borrowers in industrial countries) can be used as compensations for the lenders (Gadanecz (2004)).