

**CREDIT RATIONING AND FIRMS' SIZE:
EXPLORATORY ANALYSIS OF THE EFFECT OF THE GREAT
RECESSION (2010-2016) IN ITALY**

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Abstract: In this paper we investigate the evidence of credit rationing in Italy during the period 2010-2016 characterized by evere distress in the banking system. The role of banks in the Italian economic system is crucial, since the Italian financial system can be classified as a bank oriented one. In addition, Italian economy is characterized by a very large share of small and medium sized enterprises (SMEs). This aspect adds value to our analysis given that literature usually assumes that the smaller the firms size the larger they suffer from credit rationing. By using a unique data set, provided by Bank of Italy, we get a twofold result. First, in Italy, the last economic and financial crisis has reduced the access to banking loans for SMEs, since there is a clear hump-shaped pattern in the time series of our measures of credit rationing. Differently, for large firms, it seems to have caused a larger volatility rather than a veritable credit rationing. Second, and this is our main result, matching micro and macro data, we do find support to the intuition that different banking crises exert different effects on firms' financing conditions.

Keywords: credit rationing, small and medium-sized enterprises (SMEs), Italian Banking System, banking crisis

JEL classification: E44, G010

INTRODUCTION

In this paper we investigate the evidence of credit rationing in Italy during the period 2010-2016, aiming to ascertain whether there are statistically significant differences experienced by firms according to their size and the type of banking crisis episode. The issue of credit rationing to firms, according to their dimension, has come to the forefront of the recent empirical literature, especially in the aftermath of the recent financial crisis. This a crucial issue for the Italian economic system, as it can be considered a bank oriented economy, characterized by a very large share of small and medium sized firms (SMEs)¹. Less attention has been paid so far to the nexus between banking crisis episodes (mostly examined in a macro perspective) and the consequences for credit rationing (mostly a micro founded analysis).

By using a survey run by Bank of Italy, it was examined the extent to which the financial crisis has affected Italian firms controlling for their size. In addition, thanks to a previous study on the classification of the banking crises, it had been investigated whether different types of banking crises impact differently on credit rationing.

The main result of the paper emphasizes that in Italy, over the period 2010-2016, the severity of credit rationing was affected by the type of turbulence in the financial markets. Following the definition of banking crises adopted by Bartoletto et al. [2018], it is found that only the most severe episode, related to the sovereign debt crisis, has seriously increased credit constraints, with remarkable increase in credit rationing experienced by large firms earlier compared to SMEs. This evidence might have a twofold explanation.

On the one hand, during periods of financial distress, large firms are less able to find financial resources in the equity/stock markets, and resort more intensively to the credit market. In this sense credit constraints might be increasingly binding, and the origin is in the increased demand of credit from large firms.

On the other hand, SME might severely reduce their demand for credit loans due to a relatively more intense investment downsizing in periods characterized by deep recession (lower adjustment costs). However, despite this observed pattern

¹ The OECD defines small- and medium-sized enterprises (SMEs) as “non-subsidary, independent firms which employ fewer than a given number of employees. This number varies across countries. The most frequent upper limit designating an SME is 250 employees, as in the European Union. However, some countries set the limit at 200 employees, while the United States considers SMEs to include firms with fewer than 500 employees. Small firms are generally those with fewer than 50 employees, while micro-enterprises have at most 10, or in some cases 5, workers.” See <http://stats.oecd.org/glossary/detail.asp?ID=3123>; last access on November the 10th.

during the banking crisis of 2011, throughout the investigated period of time, 2010-2016, the SMEs have suffered greater credit constraints than larger firms.

The rest of the paper is organized as follows. Section 2 provides the motivation of the paper and the related literature review, also focusing on the role of bank credit for Italian companies. Section 3 presents the different credit rationing definitions in the light of the two banking crises episodes under consideration. This section also describes the empirical study embodying data set description, some descriptive evidence, methodology and results. Finally, section 4 concludes the research.

MOTIVATION AND LITERATURE REVIEW

A large part of the literature attributes to small and medium-sized enterprises (SMEs) the inability to obtain loans, while it believes that large companies are able to more easily access to credit. The first contribution highlighting such a difference is Gertler and Gilchrist [1994]. They analyze the different behaviors of small and large manufacturing firms after monetary policy shocks, taking into account data of the Quarterly Financial Report for Manufacturing Corporations (QFRI) from 1958 to 1990. They show that, during credit squeeze periods, the SMEs significantly reduce short-term debts, sales and inventory. Differently, large companies increase their debts to accumulate warehouse stocks. In line with this viewpoint, Costa et al. [2012] reveal that SMEs are most negatively affected by the credit crunch than large companies and that the gap lately is even larger. Overall, according to this perspective, when bank credit shrinks SMEs tend to be more vulnerable than larger firms [Wehinger 2014].

In bank-oriented financial systems the effect of banking crises might be very severe, and one of the transmission mechanisms is credit provision to firms. Albeit there is ample literature investigating the effect of banking crises on real economy, suggesting that not all banking crises are alike, less attention has been paid to understand whether different banking crises can impinge differently on the transmission mechanism working through credit provision to firms.

Our paper contributes to clarify this interaction, emphasizing that credit rationing to firms shapes differently according to either firms' size and the specific features of the banking crisis episode.

To this scope we employ the classification of banking crises introduced by Bartoletto et al. [2018], who classify a banking crisis episode occurring in a specific year T_j as a "slow-down" crisis if the following condition holds:

$$|T_j - T_{peak}| \leq 1 \quad (1)$$

where T_{peak} is the date of the upward turning point. In other words, a "slow-down" crisis spreads its effects in one year time window around a business cycle peak. All the others are "inner-banking" crises, in the sense that they do not show any

evident real impact. The most severe category of banking crisis is referred to as boom-bust crisis, namely a subset of the slowdown ones, meeting the condition:

$$0 \leq T_j - T_{peak} \leq 1 \quad (2)$$

When coming to the period of interest in the present analysis, namely 2010-2016, Bartoletto et al. [2018] find that two different banking crisis episodes have occurred: 2011 and 2013-2016. While the former meets the requirements of a boom-bust crisis, the latter is classified as an inner-banking crisis.

As it is clear from Table 1, adapted from Bartoletto et al. [2018], the boom-bust crisis did exert negative and permanent effects either on the rate of growth of GDP and on that of credit. Conversely, the period of turbulence in the banking system occurring in 2013-2016, when included in the VAR model estimated by Bartoletto et al. [2018], did not contribute to explain neither GDP nor credit dynamics.

Table 1. The effect of banking crises on the rate of growth of GDP and Loans, VAR model. Banking crisis episodes: 2011 and 2013-2016

VAR equation		Banking crisis 2011	Banking crisis 2013-2016
GDP	Estimated coefficient <i>current dummy</i>	-0.03**	-0.008
	Estimated coefficient <i>lagged dummy</i>	-0.01**	-0.0005
LOANS	Estimated coefficient <i>current dummy</i>	-0.06**	-0.04
	Estimated coefficient <i>lagged dummy</i>	-0.05*	0.002

*, **, ***: statistically significant at 10, 5 and 1% respectively.

Source: adapted from Bartoletto et al. [2018]

THE DATA SET

In this article we employ the data set of the Survey of Industrial and Service Firms (Indagine sulle Imprese Industriali e dei Servizi), available through the Bank of Italy's remote processing system.² The survey is run annually by the Bank of Italy, and collects specific information on individual Italian firms, including several measures of credit restrictions which are the focus of our analysis, jointly with firm size (see <http://www.bancaditalia.it/statistiche/indcamp/indimpser>).

As to this latter aspect, firms are classified according to their size into 6 categories, on the basis on the number of employees:

² Users are not allowed to use microdata, they can only submit the program codes and receive back the results.

- Class 0: 20 – 49 employees;
- Class 1: 50 – 99 employees;
- Class 2: 100 – 199 employees;
- Class 3: 200 – 499 employees;
- Class 4: 500 – 999 employees;
- Class 5: 1000 – over employees.

Following Cenni et al. [2015], we differentiate among: firms who would like to borrow more (*weak rationing*), companies willing to offer more guarantees, even paying a higher interest rate (*medium rationing*), firms who are denied the loan by banks (*rationing strictly defined*). The interesting aspect of this work is to investigate the trend of these variables over time and according to the firm's size, with respect to the evolution of the banking crisis episodes occurring in the period 2010-2016.

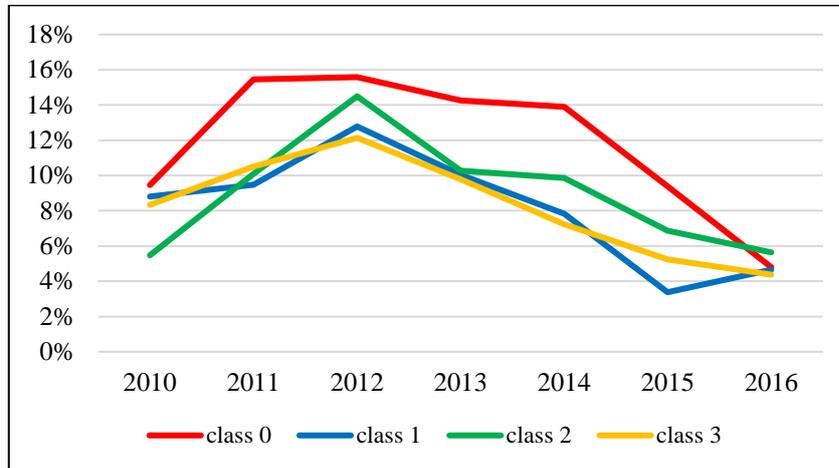
Following the standard approach in the literature [Angelini et al. 1998; Angelini, Generale 2008], a firm is considered rationed if it affirmatively answers to one of the following questions:

- Weak rationing: Please indicate whether in whole, to the currently agreed terms and conditions, would you like to have higher indebtedness with credit institutions or other financial intermediaries? (code FI53).
- Medium rationing: If you affirmatively reply to previous question, please indicate whether you are willing to pay a higher interest rate, or equally, supply more guarantees, in order to have more funding (code FI54).
- Rationing strictly defined: Please indicate whether the financial intermediaries you have got in touch with were not available to provide more funding (code FI58).

The definition of "weak rationing" also includes those firms that are discouraged to borrow additional funds and those who need them but do not have the willingness/ability to pay a higher rate or more guarantees. Whereas the definition of "medium rationing" allows to explain the behavior of banks about the choice to finance manufacturing companies, generating therefore credit rationing.

Authors investigate whether credit rationing is consistent with the macro evidence about the real impact of banking crises in the period 2010-2016. During phases of financial distress it is expected to tighten credit conditions, that could affect firms differently according to their size. In Figure 1 and 2 we focus on the definition of rationing strictly defined.

Figure 1. Credit rationing SMEs (FI58 from Class 0 to Class 3)

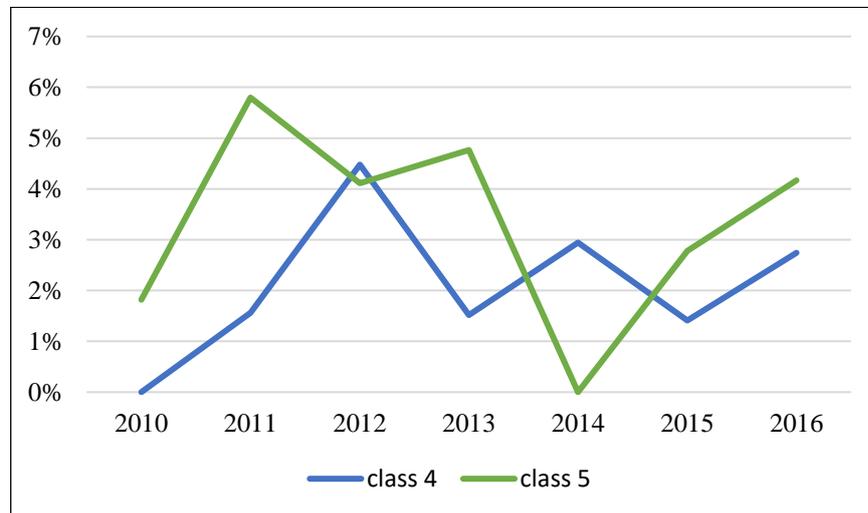


Source: own calculations (dataset: Bank of Italy, 2018)

Figure 1 shows that the extent to SME firms have experienced credit rationing strictly defined (that is they have asked for additional credit and have been denied it) follows a hump-shaped pattern, rising until 2012 and then declining. In particular class 0 (20 – 49 employees), experienced the largest share of credit rationing, reaching peaks above 15 percentage points between 2010 and 2011 and then slowly returning, in line with the other classes, to a rationing level around 5% in 2016. Also class 2 firms (100 – 199 employees) experienced many cases of credit rationing reaching a peak of 14,5% in 2012. Percentages slightly lower have been recorded for firms of classes 1 (50 – 99 employees) and 3 (200 – 499 employees), reaching peaks of about 12 percentage points in 2012. Overall, Figure 1 suggests that only the most severe episode of banking crisis, the boom bust one related to the sovereign debt crisis, has seriously increased credit rationing for SMEs.

Conversely, when turning the attention to medium and large firms, (Figure 2), it's immediate the evidence that the financial distress experienced during the period 2010-2016 has caused a larger volatility rather than a veritable credit rationing for large firms. In particular from 2010 to 2011 credit rationing for large firms, class 5 (1000 – over number of employees), rises from 2.0% to almost 6.0% and this dynamic is also observed for class 4 (500 – 999 number of employees).

Figure 2. Credit rationing and large firms (FI58 Class 4 and Class 5)



Source: our own calculations (dataset: Bank of Italy, 2018)

Then, the remarkable increase in credit rationing experienced by large firms compared to SMEs has a twofold explanation. On the one hand, during periods of financial distress, large firms are less able to find financial resources in the equity and stock markets, and they resort more intensively to the credit market. In this sense credit constraints might be increasingly binding, and the origin is in the increased demand of credit from large firms. On the other hand, SME might severely reduce their demand for credit loans due to a relatively more intense investment downsizing in periods characterized by deep recession (lower adjustment costs).

CONCLUSIONS

Literature on credit constraint has often emphasized that SME can suffer relatively more intensively from disruption in the supply of bank credit because of their opacity. In this paper we have found evidence for Italy which is consistent with the idea of flight to quality: during the last economic and financial crisis SMEs have experienced more severe credit constraints compared to large sized firms.

However, we have also find evidence that banking crises propagate their effects through credit provision to firms in a manner which is dependent upon the crises' characteristics. Moving from the classification borrowed from Bartoletto et al. [2018], we find that credit rationing increases only when boom-bust banking crises are involved. Interestingly, in this case the largest rise in credit rationing is observed for large firms, and not for SME.

The matching of micro and macro evidence, the former related to micro data on firms' credit rationing, and the latter referred to business and credit cycle dating, suggests that different banking crises exert different effects on firms' financing conditions. In other words, we find that the mechanisms of propagation of banking crises change according to the type of banking crisis, ingenerating not trivial results in terms of credit rationing and firm size.

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