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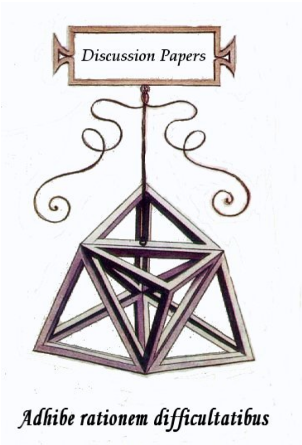

Luca Casolaro, Francesco Suppressa

Credit during the pandemics: the case of Tuscany

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Keywords: credit; Covid-19; public credit guarantee schemes; SMEs; liquidity shock

JEL CLassification: L25; H81; G32

Credit during the pandemics: the case of Tuscany [1]

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Abstract

During the Covid-19 economic shock the Italian Government implemented several measures aimed at facilitating the access to guaranteed loans, enhancing the role of the *Fondo Centrale di Garanzia* (FCG) in the financial support of the SME. In this work, we analyse various effects of these policies with a particular focus on the case of Tuscany, that exhibit a double reason for interest. Firstly, it has been interested in the first months of the 2020 by a change in regional rules that significantly enlarged the access to the Fund. Secondly, Tuscany experienced an expansion of FCG operations higher than other Italian regions. By using data from the credits register and company information, we provide evidence on the characteristics of the firms that benefited from FCG loans in terms of economic sectors, firm size and default risk. In the final section, we conduct an econometric analysis to isolate the key determinants of firms' utilization of the Fund, highlighting the importance of pre-existing banking relationships in obtaining loans backed by the Government.

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1.Introduction

In response to the corporation's liquidity shock caused by the spread of Covid-19, the Italian government implemented several credit support policies. In particular, the procedure to obtain bank loans backed by public guarantee was facilitated for small and medium enterprises (SMEs). This objective was achieved through the enhancement of the Central Fund for SMEs guarantees, commonly known as the "*Fondo Centrale di Garanzia*" (FCG or Fund), under both the DL 18/20, converted into law 27/2020 (*decreto "cura Italia"),* and the DL 23/20, converted into law 40/2020 (*decreto "liquidità").* These measures improved loan availability by simplifying access to public guarantees and simultaneously expanding the audience of eligible beneficiaries[2].

The academic literature has identified multiple factors that contribute to SMEs facing higher barriers in accessing credit compared to large firms (for a comprehensive review, refer to Beck et al., 2008). Numerous studies have shown that SMEs experience several hurdles in obtaining external financing, including issues such as inadequate collateral, information asymmetry between banks and small firms, limited cash flows and high transaction costs. In response to these challenges, many countries have established specific public credit guarantee schemes (PCGSs) to deal with these problems. PCGSs are publicly funded instruments design to mitigate the banking financial losses in the event of SME defaults. As a result of these policies, smaller firms, which are more opaque and financially fragile, can obtain loans on favourable terms (Beck et al., 2010). In Italy, a PCGS known as the *Fondo Centrale di Garanzia* (FGC) was introduced in the 2000s, but its activity significantly increased following the 2008 financial crisis.

Several empirical studies, such as De Blasio et al. (2018) and Ciani et al. (2020), have evaluated the impact of the Italian scheme *Fondo di garanzia* on financial additionalities. According to Gozzi and Schmukler (2016), the primary objective is to assess the effectiveness of the PCGS in increasing the number of loans and, while simultaneously reducing the interest rate charged by banks. Although the two aforementioned papers yield significantly different

[2] The measures also included public guarantees for large companies, delivered by Sace. Such operations are not included in the analysis

results in the analysis of the interest rate, both studies corroborate the overall effectiveness of the measure in facilitating SMEs' access to the credit market.

The PCGS covered a fundamental role during the economic crises arising from the spread of Covid-19, prompting countries worldwide to adopt special measures to support companies, particularly small and medium-sized enterprises (SMEs). In their paper, Baldwin and Di Mauro (2020) explore the policies implemented by high-income countries, examining the variations in measures adopted across different contexts and providing insights from leading economists on the optimal actions for supporting a country's economy. Many of these measures specifically target SMEs, recognizing their need for particular attention during times of uncertainty.

Following the Covid-19 crisis, many scholars have concentrated on evaluating the Paycheck Protection Program (PPP), the fund designed to support SMEs in the US. These studies have analysed various aspects, including the characteristics of companies participating in the program, their profitability in the second half of 2020, potential regional variations in program utilization, the impact on employment trends, and the significance of pre-existing bank relationships for accessing the program. Authors such as Coraroton e Rosen (2020), Granja et al. (2020), Autor et al. (2022) and Duchin et al. (2021) have found several noteworthy findings. The results of these papers show that: a) there exists a negative correlation between firm size and PPP utilization; b) approximately half of the eligible firms adopted the program; c) companies with previous bank relationships had a higher likelihood of participating in the program; and d) the PPP increased the level of employment for eligible firms.

In Europe, many governments have relied on the PCGSs to support distressed firms during the pandemic crisis, as highlighted by the European Systemic Risk Board analysis in 2021. Anderson et al. (2021) compare the regulatory frameworks of the PCGSs in the five leading European countries (Germany, France, Italy, Spain and the UK), pointing out that public loan guarantees covered a fundamental role in addressing SMEs' liquidity requirements in the Covid period. As concerns the Italian policy measures, De Socio et al. (2021) demonstrate how the economic crisis shaped by the pandemic has both heightened SMEs liquidity needs and weakened their financial position. Furthermore, a recent study by De Mitri et al. (2021) analyses the main features of the company receiving public guarantees and benefiting from moratoriums, evaluating the impact of these operations on the credit market. Other papers have studied the effect of the pandemic in terms of SME future prospects (Balduzzi et al., 2020), and the impact of the policy measures on the survival of the so-called “zombie firms” (Pelosi et al, 2021). Finally, other authors focused on descriptive analysis of the company most affected by the liquidity shock, evaluating the effect of an allocation of public resources through the bank system during a crisis (Carletti et al., 2020; Core et al., 2020).

The objective of our study is to analyse the impact of the Italian government policies in mitigating the negative effects of the pandemics on enterprises' credit access, with a specific focus on Tuscan firms. As we will explain, during the Covid period, the structure of the FCG radically changed. Previously, the FCG primarily served as a tool to facilitate investments. However, since 2020, it has become a critical factor in preserving the liquidity of companies. Furthermore, our analysis reveals significant regional heterogeneity in the utilization of the Fund, with some regions experiencing a substantial increase in their share while others observed a decrease. In this context, the case of Tuscany is particularly attractive for two reasons. Firstly, during the period under examination, the operations of the FCG in this region experienced significantly higher expansion rates compared to other regions in the country. Secondly, the introduction of the DL "*liquidità*" removed a regional law that imposed limitations on using the direct guarantee of the FCG, resulting in a structural change to this financial instrument.

A preliminary descriptive analysis in our study will focus on the sectoral distribution of the loans and the intensity in the usage of public guarantee during the Covid period. This will be measured by the ratio between this kind of loans and the pre-pandemic debt levels, allowing us to gain insights into the financial significance, dynamics, and unique aspects of FCG loans. Subsequently, by restricting our study to companies surveyed by the Cerved Group, we will analyse the features of firms that have benefited from the Fund in terms of their size, economic sectors and level of risk. This analysis will enable us to identify differences between these firms and other indebted companies that have not utilized public guarantees. Finally, we will evaluate the changes that have occurred in the participation of firms in the credit market as a result of the implementation of the new measures. In particular, we will focus on the cohort of companies recorded in the Credit register for the first time after April 2020. A comparison will be made between the characteristics of these firms and those with pre-existing banking relationships, allowing us to assess any shifts in the Italian credit market landscape.

Our main findings reveal several important insights about the impact of the Fondo Centrale di Garanzia (FCG) in Italy during the Covid-19 period. First, we observed a significant increase in the average monthly amount of bank loans guaranteed by the Fund from April to December 2020, reaching ten times the average level recorded from January 2019 to March 2020. Notably, the growth in FCG loans was more pronounced in Tuscany compared to the national average. Second, compared to indebted companies that did not use public guarantees, firms that obtained public guarantees are characterised in Tuscany by smaller size and a higher probability of ex-ante default. This result, reflecting higher risk among guaranteed firms in Tuscany, is specific to the region and not observed at the national level, likely attributable to the smaller scale of Tuscan firms compared to the national average. Third, concerning the cohort of companies entering in the financial market due to Covid-19 loans, we found that this group consists almost entirely of micro-enterprises recently founded, accounting for just the 2 per cent of the total guaranteed loans. The level of ex-ante risk for this firms was only slightly greater than of other firms, indicating that the increased participation of companies in the credit market resulting from the significant changes in the FCG did not significantly raise credit risk. Lastly, we provide clear empirical evidence that, despite all the Italian companies having the opportunity to obtain guaranteed loans, the probability of accessing the Fund was higher for firms with pre-existing bank relationships. This finding underscores the importance of pre-established banking connections in accessing the FCG.

The work is structured into seven paragraphs. In the next one, we briefly review the main theoretical frameworks related to the SMEs' credit availability issue and the emergency measures implemented during the Covid period to support this kind of firms. Paragraph 3 introduces the functioning of the FCG and examine in detail the changes made by the two decrees. Section 4 presents empirical evidence on the expanding operations of the FCG during the pandemic crisis with regard to the volume of loans made. Additionally, it explores the heterogeneity among different regions in Italy, highlighting variations between them. In paragraph 5, the case of Tuscany is compared to the rest of Italy, specifically analysing the impact of the legislative changes through the examination of a new cohort of companies that entered in the financial market for the first time. In section 6, we conduct an econometric analysis to identify the main determinants of the firms that have utilized the Fund, distinguishing between the Tuscany and the national average. Finally, in the last paragraph, we summarise and discuss our results.

2.The FCG: the institutional framework

The Fondo Centrale di Garanzia (FCG) was established in 2000 by the *Ministero dello Sviluppo* as a financial instrument aimed at supporting SMEs and autonomous workers who face difficulties in obtaining bank loans due to insufficient collateral. The primary objective of the FCG is to provide a public guarantee that complements or replaces the collateral provided by these firms. The Fund is not directly involved in the financial intermediation and in bank-firm relationship. The specific loan conditions, including the interest rate, the refund timeline, and other loan conditions are determined through a bargaining process between the financial intermediary (usually a bank) and the borrowing firm. The FCG's role comes into play when the financial intermediary requests the public guarantee on behalf of the firm. There are two options for obtaining the guarantee: a direct guarantee or a counter-guarantee. In the first scenario, the company applies for a loan backed by a direct guarantee from a bank. The bank then submits the loan request to the FCG. In the second scenario, the company demands a loan from a mutual guarantee institution (known as *Confidi* in Italian). Initially, the *Confidi* acts as the loan's guarantor. Subsequently, the *Confidi* requests a counter-guarantee from the FCG to strengthen their guarantee.

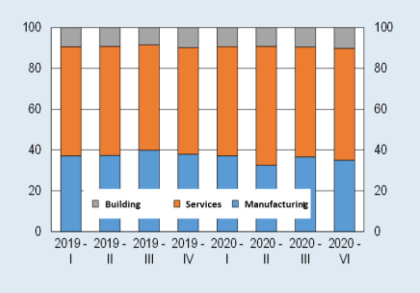
In spring 2020, the Italian government, through the DL "*cura Italia*" and the DL "*liquidità*", strengthened the public credit guarantee scheme of the FCG because of liquidity pressures caused by the pandemic crisis. These measures aimed to enhance the loan availability of the Fund, broaden the audience of beneficiaries and raise the maximum guaranteed amount for each loan. Under the DL "*cura Italia*", the guarantee became free of charge for all operations, making it more accessible for single firms. Furthermore, the maximum guaranteed amount for each firm was raised from €2.5 million to €5 million. For loans up to €1 million, the coverage percentages also increased. Direct guarantees had a maximum coverage of 80%, while re-insurance interventions could reach up to 90% coverage.

The inclusion of re-insurance interventions to the FCG's guarantees was a crucial measure introduced by the decree. This allowed for greater flexibility and additional support to firms seeking financing. However, in order to refinance the debt, firms were required to secure an additional credit of at least 10% of the residual refinanced debt amount. This ratio was later increased to 25% by the DL "Liquidità". Furthermore, the DL "Cura Italia", extended the provision of small amounts and fully guaranteed loans, also known as "*lettera m* loans." These loans, with an initial maximum amount of €25,000 (later increased to €30,000), did not require a creditworthiness evaluation, making them accessible to a broader range of firms.

Additionaly, concerning previous loans supported by the FCG, the legislative changes automatically extended the original duration of the public guarantees in cases where financial intermediaries had granted payment suspension or capital share adjustments. In addition, in relation to investment operations in the hospitality industry that met specific criteria, such as a minimum duration of 10 years and a minimum amount of € 500,000, the decree provided the opportunity of combining the FCG's guarantee with other forms of collateral. Lastly, the legislative changes enabled individuals engaged in professional or business activities adversely affected by the pandemic to access small loans of up to € 3,000. All these legislative changes have radically changed the operation of the Fund, resulting in a deeply different financial instrument compared to the pre-pandemic FCG. Prior to 2020, the FCG was primarily focused on financing investments for a limited number of SMEs. However, following the implementation of government measures, the FCG has emerged as the main instrument to address the liquidity problems of companies damaged by the pandemic. From a quantitative perspective, the effects of these changes are immediately observable by looking at the monthly increase of public guaranteed loans. Indeed, comparing the period from January 2019 to March 2020 with the subsequent Covid period (from April to December 2020), the average monthly volume of loans supported by the FCG increased more than eightfold. Specifically, there was a notable shift from 1,6 billion loans in the first period to 13,3 billion in the latter, with the total value of granted loans surpassing €120 billion.

Figure 1

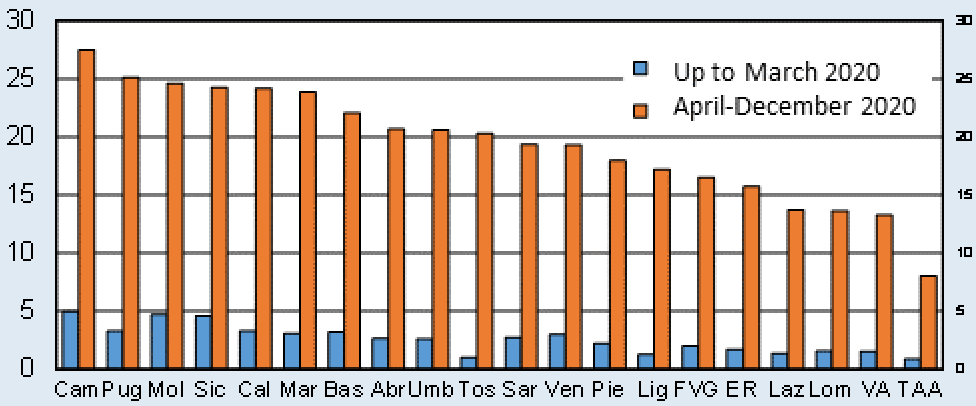
Distribution of FCG's loans among Italian economic sectors
(percentage shares)



Source: processing by the data available on FCG's website. See the methodological notes.

Figure 2

Ratio between FCG's guaranteed loans and total volume of credits (1)
(Percentage values)



Source: processing by the data available on FCG's website. The orange bar shows the ratio between FCG's guaranteed loans in the period April-December 2020 and the outstanding credit at 31 December 2019. The blue bar shows the ratio between FCG's guaranteed loans in the period July 2019 -March 2020 and the outstanding credit at 31 December 2018.

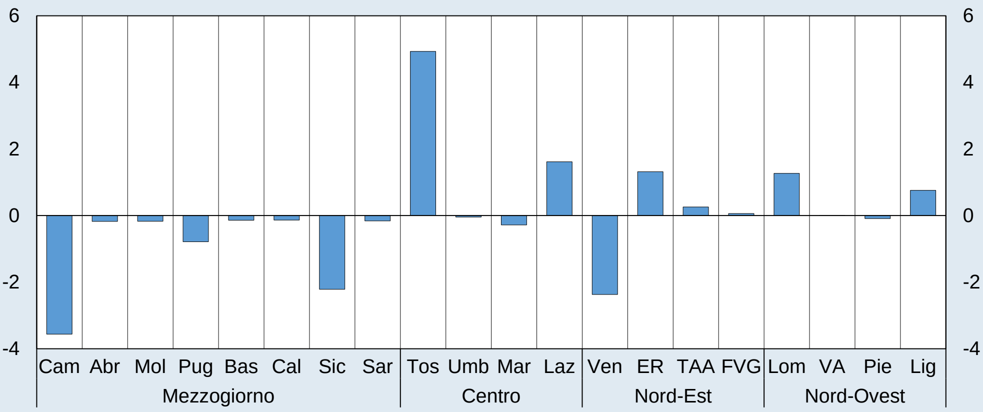
At the sectoral level, there are no significant changes in the loan proportion (refer to Figure 1). However, there is marked regional heterogeneity in the utilization of the FGC, likely attributed to different production specializations. For example, let us consider the ratio between guaranteed loans granted in the Covid period and the outstanding credit as of December 31, 2019. It is evident that certain Southern and Central regions have experienced a more substantial impact of public-backed credit on total loans. Specifically, Campania shows the highest ratio both before the Covid period (nine months from July 2019 and March 2020) and during the Covid period (27%, as shown in Figure 2). Conversely, Trentino-Alto Adige displays the lowest values in both cases[3]. However, the legislative changes have altered the relative utilization share of each region in the total volume guaranteed by the Fund. This has resulted in a decrease in the proportion attributed to Southern regions and an increase in the percentage of utilization by Central and Northern regions. In this framework, Tuscany displays the highest percentage increase in the utilization of the FCG (5 percentage points, see

[3] The particularly low flow of guaranteed loans in Trentino and especially in Alto Adige is due, on one hand, to the favourable economic situation in the region, which has resulted in subdued credit demand, and on the other hand, to the strong activity of mutual guarantee institutions (*Confidi*) in the area. This has led to a significant proportion of counter-guaranteed loans, where a smaller portion is guaranteed by the Fund.

Figure 3) and a relatively large ratio between guaranteed loans and the total loan volume (20%). These preliminaries finding highlights the intensive use of the FCG by Tuscan firms, particularly in sectors heavily impacted by the crisis.

Figure 3

Variation in the FCG utilization share of each region (1)
(Percentage points)



Source: processing by the data available on FCG's website. See the methodological notes.

3.Loans guaranteed during the pandemic: the case of Tuscany

3.1 Data Description

The analysis utilizes data from multiple sources. Firstly, data on loans granted by the FCG are directly obtained from the website of the *Fondo Centrale di Garanzia*. Between April and December 2020, only for Tuscany, we have recorded 123,511 backed loans, benefiting 96,134 companies[4]. Each loan contract provides information about the borrowing firm, loan amount, guarantee value, and the type of borrowing (e.g., "*lettera m*" loans, direct guarantee, or counter-guarantee).

[4] Refer to the methodological notes for information regarding the procedure utilized for loans provided to the same company in consecutive periods.

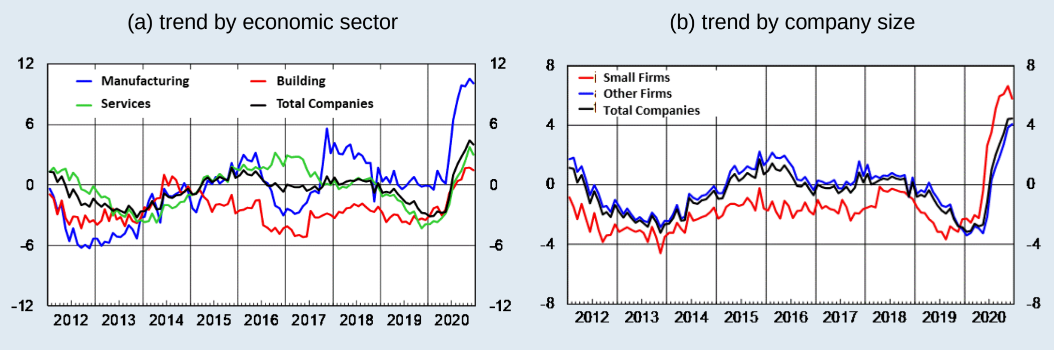
Starting from paragraph 3.3, the analysis focuses exclusively on companies surveyed by the Cerved Group in 2019. This dataset allows us to gather information on various business characteristics such as company size, sector and failure risk. In addition, we can also consult some fiscal variables to analyse differences between firms that utilized publicly guaranteed loans and those that did not. Furthermore, we also incorporate data from the *Centrale dei rischi*, the Italian credit register. By examining the date of the first registration, we can isolate firms that entered the credit system for the first time after the changes occurring in the FCG.

3.2 Guaranteed loans: trends and volumes

In Tuscany, the implementation of changes to the Public Credit Guarantee Scheme (PCGS) had a notable impact on bank lending to the productive sector. After experiencing a decline in the first part of 2020, lending activity began to rise in June. By December, we registered an annual increase of approximately 4%, driven primarily by the manufacturing sector and the SMEs (see Figure 4).

Figure 4

Tuscany credit market trend
(Percentage values)



Source: processing by the data from Cerved Group and Centrale dei Rischi (2) See the methodological notes.

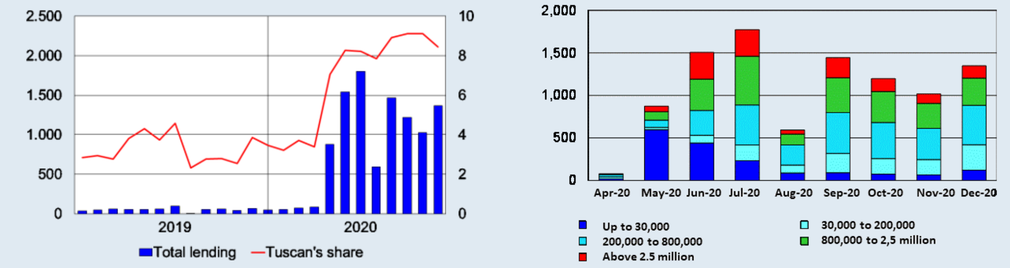
From April to December 2020, the monthly flow in guaranteed bank loans was twenty times bigger than the previous year. The total lending volume reached €10 billion, benefiting almost 100.000 firms (see Figure 5, panel a). The regional share of guaranteed loans, around 3% in the pre-Covid period, tripled at the end of 2020, reflecting a deeper recourse to the FCG by the regional corporations. These findings can be attributed to the legislative changes in the PCGS mentioned earlier, as well as the abolition of a term (specifically letter r of the D.L 112/1998, art. 18, comma 1) by the DL "*liquidità*" decree. This clause allowed Italian regions to limit the operation of the FCG solely to counter-guarantee offered by *Confidi*. Since Tuscany was one of the regions that had adopted this limitation, the removal of this constraint enabled regional firms to access direct guaranteed loans.[5]

Figure 5

Loans backed by the FCG in Tuscany

(a) Monthly volume and Tuscan share on the total (Millions of euros and percentage shares)

(b) Monthly volume by size of the loan (Millions of euros)



Source: processing by the data from Fondo Centrale di Garanzia and Centrale dei Rischi. See the methodological notes. (1) Right-hand scale.

A comprehensive analysis of secured lending to firms in Tuscany during the period from April to December 2020 reveals that around 70% of the loans were smaller-scale transactions, amounting to a maximum of €30,000. These loans were fully collateralized and constituted less than one-fifth of the overall credit volume. In contrast, larger-scale operations with loan values exceeding €800,000 accounted for 40% of the total credit amount (see Figure 5, panel b).

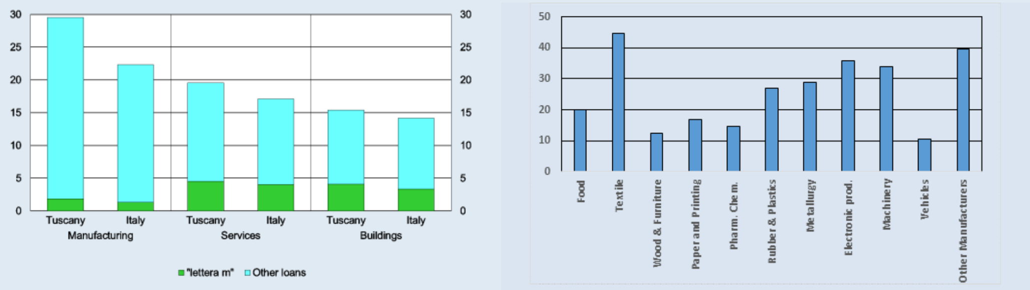
[5] A recent work (Lavecchia et al., 2020) on Italian regional law differences in the application of public guaranteed schemes confirmed that limiting the operation of the FCG causes adverse effects on accessing the credit market. In regions where such limitation was deleted, ceteris paribus, we observe a growth in the number of granted loans, a growth in the number of firms joining the credit market and a reduction in the applied rate of interest.

Figure 6

Ratio between loans backed by the FCG and the outstanding credit at 2019

(a) by sector (1)
(Percentage shares)

(b) by manufactural branches
(Percentage shares)



Source: processing by the data from Cerved Group and Centrale dei Rischi . See the methodological notes.
(1) The numerator is the volume granted by the FCG in the period between April and December 2020, the denominator is the outstanding credit at 31 December 2019 for the three main economic sectors

As regards the sectoral level, it is noteworthy that almost 40% of the existing manufacturing companies, according to the *Registro statistico delle imprese attive* (ASIA) provided by ISTAT, made use of the FCG guaranteed loans. Although slightly lower, this result is quite close to the national average (refer to Table A1). However, the ratio between the volume of loans backed by a public guarantee and the amount of outstanding credit as of 31 December 2019 for all the manufacturing companies was much higher in Tuscany than the national average (30% vs 22%; see figure 6, panel a). The intensive use of FCG loans by the textile industry in Tuscany further contributes to this discrepancy, with the ratio reaching 45% (see Figure 6, panel b). As for the service and construction sectors, we observe lower ratio values, yet even in this case, Tuscany exhibits a higher value compared to the Italian average.

In summary, Tuscan companies' more effective use of the FCG can be attributed to two factors. Firstly, the strong specialization of Tuscany in the sectors most affected by the crisis, such as fashion and tourism. Secondly, the higher proportion of firms having pre-existing banking relationships compared to the national mean, which may have allowed firms to easily access the FCG during the Covid period (further elaborated in Section 5 below).

3.3 Features of the companies assisted by the FCG

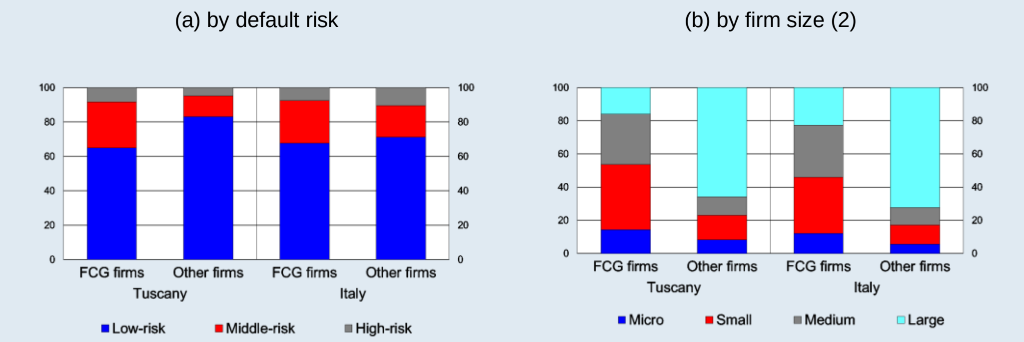
In this paragraph, we restrict our analysis to the limited companies surveyed by the Cerved Group, which accounted for over two-thirds of the total volume of guaranteed loans during the Covid period. By doing so, we aim to examine the main features of the firms that utilized the FCG and compare them with other active firms in the credit market that did not make use of public guarantees.

Our findings reveal significant differences in Tuscany between these two groups in terms of default risk and size. Specifically, among the firms that utilized the FCG from April to December 2020, low-risk companies (as determined by the Cerved score) held 62% of the total volume of guaranteed loans. In contrast, firms that did not utilize these types of loans had a share that was 14 percentage points higher (see Figure 7, panel a). Conversely, at a national level, we observe the opposite pattern, with firms utilizing FCG loans displaying a lower risk of default compared to other firms, a finding supported by the study conducted by De Mitri et al. (2021).

This anomalous result, specific to Tuscany, could be explained by the size of the firms that utilized the FCG. Among these companies, approximately 45% of their entire financial debt (see figure 7, panel b) was held by micro and small enterprises (firms with assets of less than € 10 billion). This proportion is twice as high when compared to indebted firms that did not require the public guarantee, confirming the notion that in Tuscany, the Fund was mainly used by companies smaller in size, as intended by the legislators (see De Mitri et al., 2021). Lastly, concerning sectoral differences, our data confirm the intense use of the FCG by the manufacturing sector. Manufacturing firms accounted for approximately 44% of the total debt among the loans backed by public guarantees, while this figure stood at only 25% for other firms (refer to Table A2).

Figure 7

***Features of indebted companies surveyed by Cerved* (1)**
(Percentage shares referable to the financial debt)



Source: processing by the data from Cerved Group and Centrale dei Rischi. See the methodological notes.
(1) Shares are computed by setting 100 the total financial debt of each group of firms. The default risk is based on the z-score computed by Cerved on the 2019 balance sheets. Firms showing a Z-score equal to 1,2,3 and 4 display a low-risk; firms showing a Z-score equal to 5 and 6 display a middle-risk; firms showing a Z-score equal to 7, 8, 9 and 10 display a high-risk. (2) Firm size is built based on the total assets: micro (smaller than 1 million); small (between 1 and 10 million); medium (between 10 and 50 million); large (greater than 50 million)

3.4 Participation to the credit market and the entry of new firms

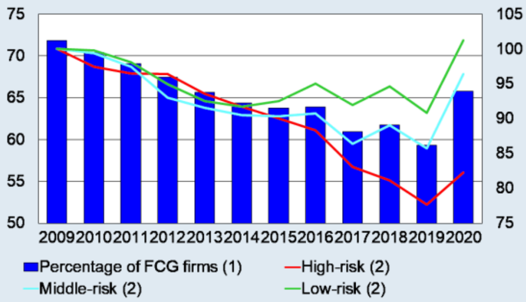
The normative changes regulating the access to the Fund, particularly those related to the DL "*liquidità*" and the introduction of the "*lettera m*" loans, as well as the removal of restriction on direct guarantees, have facilitated the entry of firms without pre-existing banking relationships into the credit market[6]. At the same time, there has been a significant reversal in the trends of firms' participation in the credit market. Indeed, following a steady decline throughout the previous decade, starting from April 2020, firms' participation has strongly returned to increase (see Figure 8). Although this trend concerned all risk profile firms, it is mainly pronounced among high-risk companies. These dynamics are of great interest not only due to their impact on the medium-term dynamics of manufacturing loans but also their consequences on the credit quality.

[6] The analysis is based on firms surveyed by Centrale dei Rischi starting from April 2020. Since there is a threshold value in order to be registered (equal to 30.000 € from 2009), the entry of firms with pre-existing bank relationships could just reflect an exceeding of the threshold value after the provision of a new loan.

By leveraging the data provided by the *Centrale dei Rischi*, we have been able to identify the firms that entered the credit market for the first time since April 2020[7]. By limiting our analysis on these new entrants within the sample of firms utilizing FCG loans surveyed by the Cerved Group, we can compare them with firms that already had pre-existing banking relationships.

Figure 8

Participation to the credit market in Tuscany (1)
(Percentage values and indices: 2009=100)



Source: processing by the data from Cerved Group and Centrale dei Rischi. See the methodological notes.
(1) Ratio between firms registered by Centrale dei Rischi and firms surveyed by Cerved for every year. In the 2020, the denominator is formed of firms surveyed by Cerved in 2019. (2) Right-hand scale. Index are obtained by setting the 2019 participation rate equal to 100. The risk level categories are identified as explained in figure 7.

The newly entering firms represented 10% of the subjects registered by the FCG and the *Centrale dei Rischi* as of December 2020, accounting for only the 1.5% of the guaranteed loan volume. The majority of these firms, approximately two-thirds, were established within the previous five years. In addition, the new entrants are characterized by their small size, with firms having less than € 5 billion in assets accounting 98% of the total volume in 2020 (compared to 58% for firms with pre-existing banking relationships). Furthermore, loans to micro-enterprises accounted for 76% of the total volume (in contrast to 11% for previously registered firms in the *Centrale dei rischi*, see Figure 9, panel b). Moreover, the new entrants display a higher default risk than firms with pre-existing banking relationships (42% vs 33%, see figure 9, panel a). This latter difference, although somewhat limited, could be attributed to their recent foundations and small sizes.

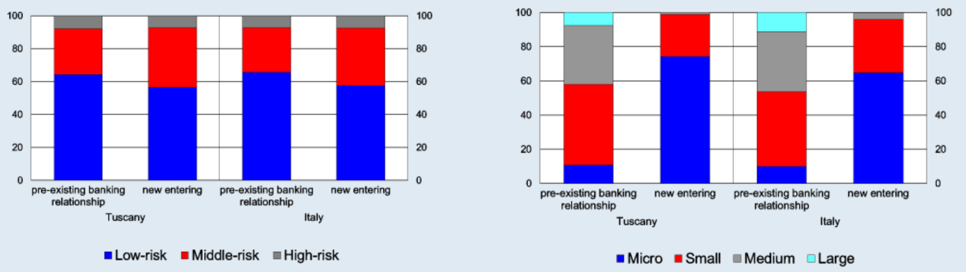
Our results suggest that the admission of several micro-enterprises to the credit market, following the measures in response to the Covid crises, should determine a limited increase in the risk of banks' assets. We believe this is the case for two reasons: the limited amount granted to these micro-companies and the moderate gap in terms of default risks with other types of companies. In this context, it is essential to mention that public guaranteed credits were not accessible for firms having non-performance loans in the pre-covid period.

[7] This group comprises firms either without existing loans or loans below the threshold value of 30.000 € before April 2020

Figure 9

Feature of firms assisted by the FCG divided by entry-time in Centrale dei Rischi (1)
(percentage shares)

(a) by default risk | (b) by firm size (2)



Source: processing by the data from Fondo Centrale di Garanzia, Cerved Group and Centrale dei Rischi. See the methodological notes. (1) firms with pre-existing banking relationships were surveyed by Centrale dei Rischi before April 2020; new entering firms entered the credit market for the first time since April 2020. The shares are computed by setting the total debt equal to 100 for each group of firms.

Compared to the national average, the new entrants in Tuscany's credit market exhibit a slightly higher level of default risk and a greater proportion of micro-enterprises. Furthermore, when examining the sectoral breakdown, it is evident that the firms entering the credit market for the first time since April 2020 are predominantly in the service industry, accounting for 63% of the total (compared to 44% for firms with pre-existing banking relationships, see Table A3). Conversely, there is a significant decline in the share of manufacturing companies among the new entrants (16% vs. 46%).

4.Probability of accessing the Fund: an econometric analysis

This section presents a multivariate analysis aimed at examining the key factors influencing the access to public guaranteed loans. The goal is to validate our earlier findings regarding the higher utilization of the FCG by Tuscan firms through a more comprehensive and systematic analysis. The analysis utilizes a sample of approximately 667.000 Italian SMEs surveyed by Cerved Group and the *Centrale dei rischi.*

The main regression model employed is as follows:

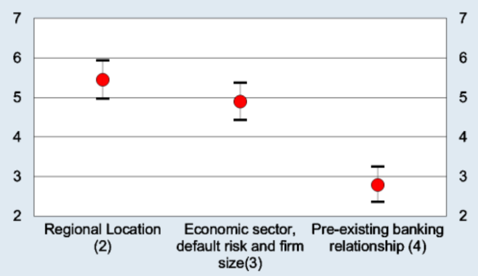
$$FCG_i = \alpha + \beta * TOSC + \gamma_1 * IMP\_RISK_i + \gamma_2 * IMP\_SETT_i + \gamma_3 * IMP\_DIM_i + \gamma_4 * IMP\_ASS + \delta_1 * IMP\_PRE_i + e_i$$

In this equation, FCG is a binary variable equal to 1 if a firm obtained a guaranteed loan between April and December 2020. TOSC is a dummy variable that is non-zero only for Tuscan companies. IMP_RISK, IMP_SET and IMP_DIM are set of binary variables representing the risk of default (based on the Cerved score), sector and size of the firms, respectively. IMP_ASS is the log of the asset value of each company. Lastly, IMP_PRE is a dummy equal to 1 if the firms presented a relationship with the banking system before April 2020.

Our estimations support the findings from the previous descriptive analysis, indicating that Tuscan companies have a higher likelihood of utilizing the FCG compared to firms in other regions. Initially, probability gap is 5.5 percentage points without considering additional covariates (see figure 10). When simultaneously considering key characteristics such as size, economic sector, and default risk of the companies, the gap reduces to 5 percentage points, indicating a persistent difference in FCG utilization. However, the divergence is halved, although still positive and statistically significant (2.9%), when accounting for the variable representing pre-existing banking relationships. Notably, in Tuscany, a larger proportion of firms have such relationships compared to other regions, and this factor is closely associated with the utilization of the FCG[8]. Therefore, we can assume that Tuscan firms' higher use of the FCG is

Figure 10

Probability of accessing the FCG:
gap between Tuscany and Italy (1)
(percentage points)



Source: processing by the data from Fondo Centrale di Garanzia, Cerved Group and Centrale dei Rischi. See the methodological notes.
(1) The red points display the coefficient values (the lines are the respective confidence interval computed at 95% degree of confidence) of the variable concerning the gap between Italy and Tuscany. We obtained it through OLS square estimations on a sample formed of Italian firms surveyed by Cerved in 2019 and Centrale dei Rischi in December 2020 (667.729 small and medium firms). The dependent variable is equal to 1 if the firms was granted by FCG. - (2) We control just for regional locations – (3) We add controls for economic sectors, firm size and default risk – (4) In addition to the previous controls, we add an indicator equal to 1 for firms with pre-existing banking relationships (before April 2020)

[8] Replicating the analysis only for firms with pre-existing banking relationships, controlling for firm size, economic sectors and default risk, the regional gap is still positive but decreases significantly. This exercise confirms that a large part of the gap is related to a stronger relationship between Tuscan firms and the bank system.

primarily related to a pre-existing closer relationship between firms and banks[9]. This conclusion is further supported by an econometric specification where all relevant variables are interacted with the Tuscan dummies. In this specification, the only statistically significant coefficient is the one pertaining to the previous banking relationship.

Table.1 Econometric analysis

Regressions	Baseline Model	Interactions		Sub-Sample	
Variables	Coef.	Coef	Coef. Toscana	Lettera_M	Other Loans
Pre-Existing Bank. Rel.	**0,37** ***	**0,37** ***	**0,03** ***	**0,31** ***	**0,39** ***
	(0,001)	(0,001)	(0,005)	(0,001)	(0,001)
Manufacrturing	**0,27** ***	**0,27** ***	**0,01**	**0,23** ***	**0,20** ***
	(0,003)	(0,003)	(0,011)	(0,002)	(0,003)
Services	**0,25** ***	**0,25** ***	**-0,01**	**0,23** ***	**0,15** ***
	(0,002)	(0,003)	(0,010)	(0,002)	(0,002)
Buildings	**0,20** ***	**0,20** ***	**0,00**	**0,21** ***	**0,09** ***
	(0,003)	(0,003)	(0,012)	(0,003)	(0,003)
Low-Risk	**0,00** ***	**0,00**	**0,00**	**-0,03** ***	**0,00**
	(0,002)	(0,002)	(0,007)	(0,002)	(0,002)
Middle-Risk	**0,12** ***	**0,12** ***	**0,01**	**0,11** ***	**0,10** ***
	(0,002)	(0,002)	(0,007)	(0,002)	(0,002)
Log_Assets	**-0,03** ***	**-0,03** ***	**0,00**	**-0,07** ***	**0,02** ***
	(0,000)	(0,000)	(0,001)	(0,000)	(0,000)
dummy_Tuscany	**0,03** ***	**0,01**	**-**	**0,02** ***	**0,03** ***
	(0,002)	(0,014)		(0,002)	(0,002)
_cons	**0,18** ***	**0,18** ***	**-**	**0,38** ***	**-0,21** ***
	(0,003)	(0,004)		(0,003)	(0,003)
N°	**678.019**	**678.019**		**585.360**	**513.450**
R-sq	**0,1359**	**0,1360**		**0,1215**	**0,2564**

*Standard errors, in parenthesis, are heteroskedasticity robust. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.*

From a theoretical perspective, the positive relationship between the existence of previous loans and the use of the FCG may be explained by several factors. Firstly, pre-existing credit history and a complete information set can facilitate the bank's credit assessment and make the firm's access to the Fund easier. Secondly, in 2020, many operations approved by the FCG consisted of renegotiation with an expansion of loans already in place.

[9] We run additional tests to verify the independence of our findings from the emersion effect that could lead to taking some firms as new entering firms incorrectly. In order to remove the emersion effect, we repeated the analysis, excluding firms with credits between 30.000 and 60.000 €, the ones that more likely hide firms that exceeded the threshold thanks to the "lettera m" loans. The results are approximately the same.

Such operations, as stipulated by legislation, were available only for firms with pre-existing banking connections. Finally, especially for micro-enterprises, a prior relationship with financial intermediaries reduces the fixed charges necessary to access the FCG.

In the last step of our analysis, we divide our observations into two sub-sample based on loan size. One sub-sample corresponds to "*lettera m*" loans, while the other include the remaining kinds of loans[10]. In the first case, we note a weaker correlation between the existence of previous loans and the probability of utilizing the FCG. Similarly, when considering only this sub-sample, Tuscan firms' greater use of the FCG is less pronounced, suggesting that this pattern mainly pertains to large and medium companies. Furthermore, in line with expectations and distinct from other loan types, the likelihood of obtaining a "*lettera m*" loan increases as the firm's size decreases. Detailed results are provided in Table 1.

5. Conclusions

In this work, we have studied the impact of the legislative changes implemented by the Italian government to face the corporation's liquidity shock caused by the spread of Covid-19, specifically focusing on the utilization of the FCG in Tuscany, where its usage surpassed the national average. This greater use could be attributed to the normative changes that expanded the operation of the Fund and eliminated a regional limitation on the direct guarantee of the FCG.

Our results confirm that, starting from April 2020 when support measures were introduced, Tuscan firms utilized the FCG more intensively compared to firms in other regions under similar conditions. Contrary to the national trend, the Tuscan companies that availed the public guarantee displayed a higher risk of default compared to other indebted firms. Furthermore, this financial tool was predominantly employed by small and manufacturing companies.

The analysis reveals that numerous new firms entered the credit market due to the legislative changes. These firms, registered for the first time by the Credit register during the

[10] In the first case, the dependent variable is equal to 1 if a firm benefited from at least one “lettera M” loan during the pandemic period. In the second case, the dependent variable is equal to 1 if the firms received at least one FCG loan different from the “lettera M” kind. In both regressions, there are firms without relationships with the FCG.

pandemic period, were primarily established in recent years and mostly comprised micro and small enterprises. However, they accounted for less than 2% of the credit stock in December 2020 and exhibited a risk profile similar to other firms registered by the FCG, but operating on the credit market prior to April 2020.

The econometric analysis conducted on a sample of Italian firms validates all the previous findings and demonstrates that a pre-existing bank relationship increases the likelihood of accessing the FCG, even after controlling for factors such as firm size, risk level, and economic sector. The analysis also shows that the percentage of firms with a previous bank relationship in Tuscany exceeded the national average. This evidence, coupled with the regional specialization in sectors heavily affected by the crisis, provides an explanation for the increased utilization of public guarantees by Tuscan firms.

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STATISTICAL ANNEX

Table a1

Firms assisted by FCG: participation rate and relative portion
(Units, millions of euros and percentage quota)

ITEMS	Manufacturing sector	Building sector	Service sector	Total
			Tuscan	
Active firms (1)	36,989	35,976	247,677	320,642
Firms assisted by FCG	14,206	11,589	68,633	96,346
Ratio between assisted and active firms	38.4	32.2	27.7	30.0
Total loans (2)	12,692	4,942	26,006	49,216
Guaranteed loans (3)	3,810	764	5,123	9,989
Portion of guaranteed loans (4)	30.0	15.5	19.7	20.3
			Italy	
Active firms (1)	377,698	493,018	3,510,754	4,381,470
Firms assisted by FCG	148,663	145,565	863,020	1,178,797
Ratio between assisted and active firms	39.4	29.5	24.6	26.9
Total loans (2)	184,220	78,528	374,864	637,488
Guaranteed loans (3)	41,109	11,126	64,227	120,497
Portion of guaranteed loans (4)	22.3	14.2	17.1	17.0

Source: processing by the data from Fondo Centrale di Garanzia and Centrale dei Rischi. See the methodological notes
(1) Database ASIA 2018. – (2) Regulatory reports at December 2019. – (3) Loans assisted by the FCG I the period April-December 2020. – (4) Ratio between FCG granted loans in April-December 2020 and total loans at December 2019.

Table a2

Features of the indebted companies
(Units, millions of euros and percentage quota)

ITEMS	Number of firms		Financial debt (1)	
	FCG firms	Other Firms	FCG firms	Other Firms
Total	23.141	10.262	13.179	23.194
		Risk Level (2)		
Low-Risk	50,1	59,9	62,4	76,1
Middle-Risk	34,6	22,6	28,8	14,7
High-Risk	15,3	17,5	8,8	9.2
		Firm Size (3)		
Micro	66,1	58,2	10,1	9,1
Small	29,6	35,2	35,1	11,7
Medium	3,8	5,1	35,4	9,2
Large	0,5	1,5	19,4	70,0
		Economic Sector		
Manufacturing	25,1	24,8	44,4	25,0
Building	11,4	13,8	5,9	4,9
Services	61,1	53,0	43,5	55,8
Altro	2,3	8,4	6,3	14,3

Source: processing by the data from Fondo Centrale di Garanzia, Cerved and Centrale dei Rischi. See the methodological notes
(1) Portions are computed setting total financial debt equal to 100. For each group of firms, the total financial debt is computed by Cerved valance sheets at December 2019. - (2) This classification is based on the z-score provided by Cerved in 2019. Low-risk firms display a z-score within the range of 1 and 4, middle-risk display a z-score equal to 5 or 6, and high risk display a z-score within the range of 7 and 10. – (3) Firm sizes are based on the total active of 2019: micro (smaller than 1 million), small (between 1 and 10 million), medium (between 10 and 50 million) and large (larger than 50 million).

Table a3

Features of the Tuscan companies assisted by the FCG (1)
(Units, millions of euros and percentage quota)

ITEMS	Number of firms		Financial debt	
	pre-existing banking relationships (2)	new entering (3)	pre-existing banking relationships (2)	new entering (3)
Total	17.953	1.873	7.033	105
	Risk Level (4)			
Low-Risk	49,0	53,2	64,3	58,5
Middle-Risk	35,3	35,0	27,7	34,6
High-Risk	15,7	11,9	8,0	6,9
	Firm Size (5)			
Micro	57,8	93,0	10,9	76,2
Small	36,7	6,9	47,1	22,6
Medium	4,9	0,1	34,4	1,1
Large	0,6	0,0	7,5	0,0
	Economic Sectors			
Manufacturing	28,7	13,0	45,7	15,3
Building	10,4	14,5	6,3	14,7
Services	58,1	71,5	44,2	63,0
Others	2,7	1,0	3,8	7,0

Source: processing by the data from Fondo Centrale di Garanzia, Cerved and Centrale dei Rischi. See the methodological notes
(1) Portions are computed setting total financial debt granted by FCG equal to 100. For each group of firms, the total financial debt is computed by Cerved valance sheets at December 2019. – (2) Firms surveyed by Centrale dei Rischi before April 2020. – (3) Firms entered the credit market for the first time since April 2020. - (4) This classification is based on the z-score provided by Cerved in 2019. Low-risk firms display a z-score within the range of 1 and 4, middle-risk display a z-score equal to 5 or 6, and high risk display a z-score within the range of 7 and 10. – (5) Firm sizes are based on the total active of 2019: micro (smaller than 1 million), small (between 1 and 10 million), medium (between 10 and 50 million) and large (larger than 50 million).

Methodological Note

We run the analysis using the Fondo Centrale di Garanzia (FCG) dataset. In the dataset we used for the preliminary descriptive analysis, containing 123.511 guaranteed loans referable to 96.346 Tuscan firms between April and December 2020 (respectively, 1.552.329 e 1.178.797 in the case of Italy), the loan referable to the same firm and executed in the same month were aggregated in just one loan. Differently, loans referable to the same firm but executed in different months were taken as different loans. In the case of a firm asking for guaranteed loans referable to seats in different regions, we followed the allocation key specified by the FCG. Therefore, we preserved the regional distinction without aggregating according to the firm's headquarters. The data on the FCG loans percentage proportion by economic sectors were computed in relation to the total number of firms of each sector according to the statistical register of active companies (ASIA) provided by Istat. We used the 2018 version. The so-called "lettera M" category loan was built starting from the definition available in the DL "liquidità".

The sections about the features of the companies used the following firm units:

a) assisted directly by the FCG;

b) surveyed by Cerved in 2019, displaying information about firm size, default risk, and economic sector;

c) registered by Centrale dei Rischi at 31 December 2020

In this part of the analysis, the FCG data were aggregated to obtain a unique observation for each firm. The credit amount is the value of all the loans stipulated in the period between April and December, maintaining “lettera M” loans isolated. The geographic location of each firm was taken by the correspondent Cerved variable.

Regarding the further study on companies assisted by the FCG, considering the firms surveyed by Cerved, we conducted a comparative analysis between firms using public guarantees in the period April-December 2020, and other active firms on the credit market (according to Centrale dei Rischi) which did not use the public guarantees. In Tuscany, the number of companies assisted by the FCG was 23.141, the other group was formed of 10.062 units.

The analysis concerning the differences between firms entering the credit market for the first time (registered by Centrale dei Rischi for the first time after March 2020) and those with pre-existing banking relationships involves firms assisted by FCG loans in the period April-December 2020 and simultaneously registered by Centrale dei Rischi at December 2020. In total we find 19.826 firms.

Finally, the econometric analysis is based on a sample of Italian firms surveyed by Cerved in 2019 (667.729 firms) and registered by Centrale dei Rischi at December 2020. In total these firms accounted for more than two-thirds of the guaranteed loans volume during the Covid period. The dummy variable “IMP_PRE” is equal to 1 if the firms presented a relationship with the banking system before April 2020.