Impact of public guarantees on optimal debt levels following the COVID-19 pandemic: Efficiency in their allocation

J. Samuel Baixauli-Soler
Department of Management and Finance
Faculty of Economics and Business
University of Murcia
Murcia, Spain

Gabriel Lozano-Reina
Department of Management and Finance
Faculty of Economics and Business
University of Murcia
Murcia, Spain
e-mail: gabriel.lozano@um.es
ORCID: 0000-0002-1225-3422
(*Corresponding author*)

Susana Álvarez-Diez
Department of Quantitative Methods for the Economy
Faculty of Economics and Business
University of Murcia
Murcia, Spain

Diego Rodríguez-Linares Rey
PhD Programme in Economics
International Doctorate School (EIDUM)
University of Murcia
Murcia, Spain

Cite as: Baixauli-Soler, J.S., Lozano-Reina, R., Álvarez-Díez, S. & Rodríguez-Linares Rey, D. (2023) Impact of public guarantees on optimal debt levels following the COVID-19 pandemic: efficiency in their allocation, Spanish Journal of Finance and Accounting, DOI: 10.1080/02102412.2023.2177460

Impact of public guarantees on optimal debt levels following the COVID-19 pandemic: Efficiency in their allocation

Abstract

The COVID-19 pandemic triggered a sudden drop in companies' sales and turnover, which resulted in serious liquidity and solvency problems. In an effort to cushion these unfavorable effects, a credit guarantee plan was launched in 2020 by the Spanish Government to mitigate the effects of COVID-19 by injecting firms with liquidity. This paper seeks to analyze the impact of this public policy on SMEs' optimal debt levels and to examine whether the allocation of this public funding has been efficiently targeted at those SMEs suffering temporary distress as a result of the pandemic. Based on a sample of 3,305 Spanish SMEs, our results show that the government's interventionist policy swelled excess debt levels – mainly due to the increase in excess long-term debt– and deviated them from the optimum. Moreover, although these public guarantees should mostly have been aimed at SMEs experiencing a temporary decline due to COVID-19, we find that these SMEs were the least likely to receive liquidity injections.

Keywords: Public guarantees; debt levels; allocation of public guarantees; government interventionist policy; COVID-19 pandemic; ICO

1.- Introduction

The pandemic caused by COVID-19 triggered a crisis that impacted health, social, and economic areas worldwide. In terms of the economic effects, this health crisis hit financial markets as well as the activity and performance of most companies, whose sales and profits plummeted, resulting in liquidity and solvency problems (Almeida, 2021; Blanco et al., 2021; Demmou et al., 2021; He et al., 2020). In an effort to cushion these unfavorable effects, governments worldwide implemented several policies to reverse this delicate situation (Kahn & Wagner, 2021). Added to these were the measures launched by other institutions such as the Spanish Mutual Guarantee Societies, who also helped to mitigate the economic problems arising from the COVID-19 pandemic (Corredera-Catalán et al., 2021). Prominent among the various measures implemented to alleviate

the negative effects of the pandemic were public guarantees –whose objective was to facilitate company access to credit (Core & De Marco, 2021). These public guarantees – often channeled through banking entities– involve governments reimbursing the banking entity for the amount of the outstanding loan should the firm default (Corredera-Catalán et al., 2021).

In Spain, the Official Credit Institute (ICO)[1] helped to mitigate the effects of the COVID-19 crisis both by facilitating liquidity and/or by encouraging company investment (Blanco et al., 2021). Specifically, a public credit guarantee plan –endowed with over €100,000 million– was launched in 2020 to cover new loans and other forms of financing in addition to renewing the support granted by financial entities to companies and self-employed persons to meet their financing needs (ICO, 2020; *Real Decreto-Ley 25/2020, de 3 de julio, de medidas urgentes para apoyar la reactivación económica y el empleo*, 2020). Despite this public aid being led by the ICO, management thereof was conducted through the banking sector, specifically by the financial entities that voluntarily joined this program.

Although any company or self-employed worker domiciled in Spain who suffered financial hardship due to COVID-19 was eligible to become a beneficiary of this aid, the distribution agreed by the government meant that small and medium-sized enterprises (SMEs) and the self-employed were the main recipients (ICO, 2020). Over 55% of SMEs in Spain requested financing lines after the outbreak of the pandemic, and several operations were guaranteed amounting to €64,120.8 million by the end of 2020. This allowed SMEs to receive €90,221.9 million of financing to guarantee their liquidity (ICO, 2020). The government's interventionist policy may have impacted debt levels since this

[1] The Official Credit Institute (ICO) is a Spanish national bank linked to the Secretary of State for Economy and Business Support. It plays a three-fold role as a credit institution, an economic policy financial instrument, and as a state funding agency. For more information, visit the website: https://www.ico.es.

aid –which involves injecting liquidity into companies– may have increased SMEs' abnormal level of debt (by raising debt levels above optimal levels), beyond transforming said organizations' capital structure (by replacing short-term guarantees with banks for long-term public guarantees with a period of grace, a feature of this public aid for containing COVID-19). Added to this is the fact that the banks –responsible for managing and channeling these "public" guarantees– may have adopted more risky or imprudent decisions (compared to those they would otherwise take when granting private bank guarantees) since the risks and costs they assume are much lower (Cordella et al., 2018; Gropp et al., 2014; Leonello, 2018). All of this led to inefficient allocation of public guarantees that generated excess liquidity in SMEs, and increased debt levels above the optimum.

In addition to adequately designing and implementing public policies, it is vital to analyze to what extent public funding has been distributed efficiently and in accordance with the objective established by the financier. In this sense, public credit guarantees –promoted by the Spanish government– were intended to inject liquidity into companies who experienced a significant decline in turnover and sales, caused exclusively by the COVID-19 pandemic (ICO, 2020). For this reason, efficient allocation of this public aid is conditional upon it being directed towards SMEs who suffer temporary economic-financial distress, i.e., towards SMEs who, after the outbreak of the COVID-19 pandemic, were at increased risk of default and/or of seeing their growth opportunities, non-debt tax shield, or financial performance negatively impacted (e.g., Abu Hatab et al., 2021; Apergis et al., 2022; Gormsen & Koijen, 2020; Padhan & Prabheesh, 2021; Sarker et al., 2022; Sun et al., 2022). Moreover, SMEs who suffered any distress prior to COVID-19 (i.e., distress considered to be structural) should not have been beneficiaries of this public aid. This is because if this public liquidity is directed towards SMEs that suffer structural

distress and which are close to bankruptcy then these SMEs would tend to invest this money in very risky projects (even those with a below zero NPV), thereby increasing the shareholder-creditor agency conflict (Ayotte et al., 2013; Chu, 2017) and reducing efficient allocation of this public aid.

Based on this, the present paper pursues a twofold objective. First, we analyze in Spanish SMEs whether, as a consequence of the Spanish government's interventionist policy, there were changes in excess debt levels in 2020 due to the COVID-19 pandemic by comparing actual (observed) debt levels and optimal debt levels. This allows us to check how debt targets may deviate from optimal thresholds when excess liquidity is injected by governments. Second, we analyze whether or not the allocation of public funding (mainly channeled through guarantees granted by the ICO) proved to be efficient by verifying to what degree this public aid has actually been directed towards SMEs that suffered temporary distress. Taking into consideration that this public aid was exclusively intended to remedy SMEs' "short-term" or "temporary" financial decline triggered by the health crisis, we test whether the potential distress suffered by an SME is structural (i.e., whether it was already present before the outbreak of the pandemic) or temporary (i.e., related to the outbreak of COVID-19). We also examine whether SMEs, as a result of this public aid, replaced bank guarantees (generally short-term) for public guarantees. This allows us to assess whether public aid has been used efficiently for the real purpose intended by the government (i.e., to remedy temporary distress) or whether, by contrast, there is inefficiency in the allocation of this aid.

Our results show that this government's interventionist policy swelled excess debt levels –mainly due to the increase in excess long-term debt– and deviated them from the optimum. Moreover, although these public guarantees should mostly have been aimed at

SMEs experiencing a temporary decline due to COVID-19, we find that these SMEs were the least likely to receive liquidity injections.

By addressing these objectives, this paper seeks to contribute to the literature in the following main ways. Firstly, this paper contributes by providing novel and fresh evidence on pattern changes experienced in leverage due to the Spanish government's intervention. The injection of liquidity has caused a deep structural change by replacing short-term with long-term debt under favorable conditions by SMEs. This fact, which is particularly important, should be taken into account by researchers, and should alert them to consider this COVID period when carrying out new studies, due to the abnormal patterns experienced by several economic-financial indicators (such as liquidity and debt ratios). Secondly, this research provides evidence on the effectiveness of the channel used by the Spanish government to target government funds, by using banking entities as intermediaries to deploy these public guarantees (rather than opting for direct government allocation) –taking the problems associated with information asymmetries, moral hazard, and/or adverse selection into account. Finally, this research also helps policymakers to adopt decisions about whether or not to make (disproportionate) injections of liquidity into the economy due to the impact this has on levels of optimal and excess debt. Particularly highlighted is the need to monitor the intermediation of public financing lines aimed at meeting the ultimate objectives set out in the calls (i.e., ensuring that the allocation of public aid is carried out efficiently).

This article is structured as follows. After this introduction, the second section reviews the literature on public guarantees and their allocation, and then proposes several research questions regarding these topics. The main methodological issues (i.e., sample, data, period, models, analysis) are then provided in the third section. The main results of this research are then highlighted in the fourth section. Finally, in the last section, the

main conclusions obtained are stated and the key practical and theoretical implications are discussed.

2.- Literature review

2.1.- Impact of the Spanish government's interventionist policy on debt levels

A company's ability to generate "cash" is key to its survival, particularly during a period of recession such as the one following COVID-19 (Belghitar et al., 2022). In the field of SMEs, this liquidity is even more important given the low level of cash these companies hold compared to large companies (Belghitar et al., 2022; Belghitar & Khan, 2013), to which is added the difficulty SMEs have in accessing the capital market. However, the COVID-19 pandemic triggered serious liquidity problems, arising from a sudden drop in sales and turnover, and which impacted businesses' normal functioning and operating (Cressy, 2006; Ghosal & Ye, 2015) –as Fairlie & Fossen (2022) also noted in the context of COVID-19. In addition, this liquidity crisis placed companies in a situation of particular vulnerability and increased the chances of bankruptcy and failure (Lu et al., 2020). This difficult situation forced policymakers worldwide to face the challenge of finding the most effective way to deploy government funds to cushion the negative effects of COVID-19 and thereby (at least partially) limit the downturn in the economy (Core & De Marco, 2021).

In this context, governments could opt for two different alternatives (Core & De Marco, 2021): they could grant public loans directly or could channel public guarantees through banking entities. In Spain, the government opted for the second option and engaged in a program of public guarantees –led by the ICO and managed by banking entities– and which was aimed at increasing company liquidity (ICO, 2020) and so offsetting the potential risks of insolvency arising from the sudden drop in turnover and

sales caused by COVID-19. Channeling these public guarantees through banking entities made it possible to overcome several deficiencies that previous literature has associated with cases of direct government allocation, such as avoiding inefficiencies derived from political connections (Khwaja & Mian, 2005) and minimizing the costs derived from asymmetric information, since any financial losses suffered by the bank –as the lender– are potentially removed (Carvalho, 2014; Sapienza, 2004; Zecchini & Ventura, 2009). In addition, "public contribution" to the guarantee system usually implies a significant leverage effect since small cash outlays may leverage a large number and volume of loans (Corredera-Catalán et al., 2021). This makes public guarantees a "cost-effective way for the government to support bank lending to SMEs, because they require low initial outlays compared to direct lending" (Core & De Marco, 2021, p. 4).

These public guarantees are thus an interesting tool to improve access to credit for SMEs, who often experience greater difficulty in participating in private credit markets due to existing information asymmetries (Corredera-Catalán et al., 2021). Although these guarantees have contributed positively to strengthening SME stability, a large injection of liquidity, as was the case of Spain, may affect optimal debt levels –defined as the debt level that would result after considering the specific impact of its determining factors (e.g., Aybar-Arias et al., 2012; D'Amato, 2020; Lopez-Gracia & Mestre-Barbera, 2011; Lopez-Gracia & Sogorb-Mira, 2008; Serrasqueiro et al., 2012)– in particular with regard to long-term debt, which is the time horizon that characterizes such guarantees (ICO, 2020). The literature assessing public credit guarantee plans is clear in pointing out that these guarantees tend to increase debt levels (Gazaniol & Lê, 2021). This requires particular analysis, since excessive growth of SME debt levels –away from optimal thresholds– can lead to severe risk of default. Furthermore, a disproportionate increase in

debt levels leads to greater financial instability, should the beneficiaries of these guarantees be unable to meet the commitments undertaken (Gropp et al., 2014).

In sum, we expect the interventionist policy implemented by the Spanish government due to COVID-19 –and which consists of promoting public guarantees to inject liquidity into businesses– to have increased excess debt levels (or abnormal debt levels) of Spanish SMEs in 2020 compared to pre-pandemic years. This is the question which we seek to find an answer to.

2.2.- Efficiency in the allocation of public guarantees

Policies implemented by the Spanish government –in particular the public guarantees policy led by the ICO (ICO, 2020)– helped to alleviate the negative economic effects arising from the COVID-19 pandemic. However, efficient execution of these policies is complex –a challenge which is even greater in the field of SMEs since these organizations are highly decentralized and there is asymmetric information that increases the gap between SMEs' needs and government actions (Sun et al., 2022; Zhu et al., 2020). Added to this is the problem of "adverse selection" (Core & De Marco, 2021), which could lead to inefficient channeling of this public aid –i.e., when these public guarantees are channeled towards SMEs that do not suffer deterioration, towards SMEs that could have obtained private financing through other ways, or towards marginally risky SMEs that do not meet aid requirements.

The Spanish government's interventionist policy might have been considered efficient if the injection of liquidity had been directed towards SMEs who suffered temporary distress, as stated in the call for these grants (ICO, 2020). Here, it is necessary to differentiate between *structural distress* and *temporary distress*. We consider structural distress to be that which already existed before the outbreak of the pandemic, while

temporary distress is a period of weak growth resulting from a specific event (such as the COVID-19 pandemic), where this cyclical shock is expected to return to its previous level shortly (Baily et al., 2001). Spanish government programs designed to contain the downturn in the economy were aimed exclusively at remedying temporary distress (ICO, 2020). In other words, beyond merely targeting SMEs that suffered any kind of decline, efficient allocation of this public aid should therefore have been aimed at firms whose downswings were temporary (i.e., distress resulting from the outbreak of the pandemic).

Efficient allocation of this public aid is thus conditional upon these guarantees being predominantly directed towards SMEs whose default risk, growth opportunities, NDTS, and/or financial performance worsened due to COVID-19, since these are the main economic-financial factors impacted by the pandemic (e.g., Abu Hatab et al., 2021; Apergis et al., 2022; Gormsen & Koijen, 2020; Padhan & Prabheesh, 2021; Sarker et al., 2022; Sun et al., 2022). More specifically, *default risk* and *business opportunities* are two factors affected by crises such as the one triggered by COVID-19 since, during economic downturns, firms are more constrained, growth opportunities become limited, and earnings volatility increases (D'Amato, 2020). In this sense, the pandemic increased firms' risk default (Apergis et al., 2022) beyond increasing the risk suffered by the banking sector (Elnahass et al., 2021). When analyzing a sample of Egyptian SMEs, Abu Hatab et al. (2021) state that the risks associated with COVID-19 are considered an unprecedented situation that posed significant risks and generated high levels of uncertainty. This makes default risk one of the variables that government interventionist policies seek to influence in order to contain the downturn in the economy. Moreover, SMEs' growth opportunities were also affected as a result of the COVID-19 pandemic (Gormsen & Koijen, 2020) since these businesses experienced a sudden drop in their revenues and an increase in their pressure on earnings. This is especially worrying in the

case of SMEs, since one of the main barriers they face is, precisely, financing (Wang, 2016) –one of the aspects most severely impacted by COVID-19.

Additionally, *NDTS* might have represented the main alternative to reducing tax burdens for two main reasons: first, because SMEs are more likely to use NDTS instead of debt as a tax shield due to their lower probability rates, and second because SMEs often receive favorable treatment by the tax code (D'Amato, 2020; Lopez-Gracia & Sogorb-Mira, 2008). However, the onset of COVID-19 acted as a brake to using NDTS as an alternative to debt. Finally, SMEs' *financial performance* is another of the factors most severely affected by the distress these organizations experienced after the outbreak of the pandemic (Padhan & Prabheesh, 2021; Sun et al., 2022). Uncertainty is one of the main reasons undermining firm performance –and the recent COVID-19 pandemic resulted in considerable uncertainty in the global economy (Zhang & Zheng, 2022). SMEs suffered a drop of over 40% in their production volume compared to the year before the pandemic (Sarker et al., 2022). Added to this are other difficulties such as the postponement of the resumption of work, the slump in market demand, and restrictions on logistics and flow of people (Sun et al., 2022).

In this context, the role played by banking entities is vital in terms of achieving efficient allocation since the latter are responsible for allocating these "public" guarantees. Leaving the channeling of this public aid in the hands of the banks tends to minimize problems linked to direct government allocation, as discussed above (see Carvalho, 2014; Khwaja & Mian, 2005; Sapienza, 2004; Zecchini & Ventura, 2009). However, banks might have fewer incentives to screen and monitor borrowers in the presence of moral hazard. They may therefore tend to display more reckless behavior, since they become less concerned about assuming risks, given that they do not have to bear the costs of potential failure (Cordella et al., 2018; Gropp et al., 2014; Leonello,

2018). In other words, these public guarantees may induce banks to take excessive risks (e.g., allocating guarantees to firms that do not need extra liquidity or over-allocating them towards certain SMEs) (Gropp et al., 2014). In this way, future defaults might increase, leading to "a high cost of the scheme for public finances ex-post" (Core & De Marco, 2021, p. 7).

In sum, whether public credit guarantees were or were not directed towards SMEs suffering temporary deterioration is ultimately an empirical question, and is one which we attempt to find an answer to.

3.- Methodology

3.1.- Sample and data

Our sample comprises a subset of Spanish SMEs, since analysis thereof is of particular importance within this field given that these firms –together with self-employed workers– were the main target of guarantees/aid from the government because of the COVID-19 pandemic (ICO, 2020). Following the recommendation of the European Commission 2003/361/CE, we consider SMEs to be organizations that meet the following three requirements: (a) businesses with less than 250 employees; (b) whose annual turnover does not exceed €50 million; and (c) whose assets do not exceed €43 million. We specifically took SMEs included in the SABI (*Iberian Balance Analysis System*) database. This study does not cover all Spanish SMEs included in this database since we implement a double filter: first, we include SMEs belonging to sectors that concentrate most guarantees/aid[2]. These six sectors are: electricity, gas, and water (sector 03); manufacturing (sector 04); construction (sector 05); commerce, hotels, and catering

[2] See the reports published in https://www.ico.es/web/guest/ico/informes-seguimiento-linea-avales

(sector 06); transport and communications (sector 07); and education, health, and others (sector 09).

Second, in order to increase the quality and homogeneity of our data, firms that meet some of the following criteria are excluded: (i) micro-enterprises, given that the quality of the economic-financial data of these firms is often lower when compared to larger companies (Lopez-Gracia & Mestre-Barbera, 2011). For this reason, we exclusively focus on small and medium-sized companies (between 10 and 250 employees); (ii) companies involved in a bankruptcy or liquidation procedure. In this sense, SMEs whose assets have a negative value or one equal to zero are directly excluded (D'Amato, 2020); (iii) companies for which there is no information available for all years; and (iv) we removed extreme values, i.e., observations in the extreme 1% distribution at both tails for each variable in order to control for extreme values and outliers (Ashley & Yang, 2004; Chen et al., 2018).

After applying this double filter, our sample is composed of 3,305 Spanish SMEs, which are analyzed in the period between 2011 and 2020. Specifically, 2011-2017 is considered as a "control" period for estimating the optimal debt model since the relationship between optimal debt and its main determining factors during this period will not be influenced by government interventionist policies. Moreover, 2018-2020 is considered as the main period –where 2018 and 2019 are specifically considered as the "pre-COVID period" and 2020 is considered as the "COVID period". These three years were chosen because the comparison between 2018 and 2019 allows us to test pre-pandemic variations, while the comparison between 2020 and 2019 allows us to test COVID variations.

The distribution of SMEs by sectors is shown in Table 1. As can be seen, most of the SMEs are included within commerce, hotels, and catering (sector 06) and

manufacturing (sector 04), and account for 37% and 20% of Spanish SMEs, respectively. In contrast, education, health, and others (sector 09) only represent 4% of SMEs.

Insert Table 1 about here

3.2.- Estimation of excess debt levels

In order to analyze to what extent there is excess debt (or an abnormal increase in debt) due to the COVID-19 pandemic, we first test whether excess debt in 2020 differs from zero (i.e., $H_0: \mu_{2020} = 0$; $H_A: \mu_{2020} \neq 0$). After that, we verify whether the possible mean differences between the COVID-year (i.e., 2020) and the pre-COVID period are significantly different from zero (i.e., $H_0: \mu_{2020} - \mu_{2109} = 0$; $H_A: \mu_{2020} - \mu_{2019} \neq 0$)[3]. For this purpose, we follow a two-stage procedure (Hovakimian et al., 2001).

In the first stage, as shown in Equation 1, debt levels are regressed on a vector of explanatory variables that are considered as the main determining factors of optimal debt levels for SMEs (Aybar-Arias et al., 2012; D'Amato, 2020; Lopez-Gracia & Mestre-Barbera, 2011; Lopez-Gracia & Sogorb-Mira, 2008; Serrasqueiro et al., 2012). We use a panel data method because it offers more information, greater efficiency, and greater variability compared to other methods, thereby providing improvements in our econometric specifications and estimation (Balgati, 2001). This panel data is carried out for the control period (2011-2017) and is estimated for three different debt variables: total, short-term, and long-term debt. The purpose of this first stage regression is to obtain the estimation of coefficients (or beta) of each determining factor.

$$DEBT_{it} = \beta_0 + \beta_1 \cdot DEBT_{it-1} + \beta_2 \cdot RISK_{it} + \beta_3 \cdot GROWTH_{it} + \beta_4 \cdot TANG_{it} + \beta_5 \cdot NDTS_{it} + \beta_6 \cdot SIZE_{it} + \beta_7 \cdot TAX_{it} + \beta_8 \cdot LIQUID_{it} + \beta_9 \cdot AGE_{it} + \beta_{10} \cdot ROA_{it} + n_i + d_t + \psi_i + e_{it} \quad (1)$$

[3] Rather than performing regression analysis, we carry out this type of analysis because it is not possible to identify which specific SMEs received a public guarantee. As indicated in the limitations in the last section of this paper, the ICO does not provide us with this information due to its confidentiality policy.

As regards Equation 1, the dependent variables are alternatively: total debt level (TOTAL_DEBT), which is measured as the ratio of total liabilities to total assets of firm *i* in year *t*; short-term debt (ST_DEBT), which is measured as the ratio of short-term liabilities to total assets of firm *i* in year *t*; and long-term debt (LT_DEBT), which is measured as the ratio of long-term liabilities to total assets of firm *i* in year *t* (Aybar-Arias et al., 2012; Serrasqueiro et al., 2012). Beyond considering debt levels in the previous year, the following determining factors of optimal debt within SMEs are included as independent variables (e.g., Aybar-Arias et al., 2012; D'Amato, 2020; Lopez-Gracia & Mestre-Barbera, 2011; Lopez-Gracia & Sogorb-Mira, 2008; Serrasqueiro et al., 2012):

(1) *Default risk* (RISK), whose influence on debt levels may be mixed. A priori, leverage tends to be reduced as this risk is greater –in particular within SMEs since they are more prone to the risk of default. This default risk is often associated with the volatility of company profits or operating income. When this volatility increases, the likelihood of SME bankruptcy or failure is greater (D'Amato, 2020), thereby increasing the incentives to reduce debt (Aybar-Arias et al., 2012; Wald, 1999). However, when debt maturity increases, this relationship could become positive to the extent that "the sensitivity of the (tax-deductible) default premium per unit time to risk increases with maturity, and tax shields on the default premium can be earned before bankruptcy costs are faced at maturity" (Wiggins, 1990, p. 384). Default risk is thus expected to be negatively (positively) associated with short-term debt (long-term debt). This variable is measured as the absolute value of the variation of operating profits of firm *i* in year *t* (Serrasqueiro et al., 2012).

(2) *Growth opportunities* (GROWTH) also affect debt level. Highly-leveraged SMEs with high growth opportunities –which often face a problem of underinvestment– are expected to renounce investment projects that have a positive net worth (Aybar-Arias

et al., 2012; Lopez-Gracia & Sogorb-Mira, 2008; Myers, 1977). High-growth SMEs are also more likely to fail (compared to low-growth SMEs) and should thus be less leveraged (D'Amato, 2020). A negative relationship is therefore expected between growth opportunities and optimal debt levels. This variable is measured as the annual growth rate of the sales of firm *i* in year *t* (D'Amato, 2020).

(3) *Tangibility* (TAN), whose importance is due to the fact that tangible assets increase the solvency of SMEs, favoring their debt capacity (Aybar-Arias et al., 2012). This factor's impact on leverage should, nevertheless, be nuanced depending on debt maturity, since SMEs should adjust the maturity of their liabilities to the maturity of their assets (D'Amato, 2020). In this way, tangible assets are expected to be negatively (positively) associated with short-term debt (long-term debt). This variable is measured as the ratio of fixed assets to total assets of firm *i* in year *t* (Aybar-Arias et al., 2012; Serrasqueiro et al., 2012).

(4) *Non-debt tax shields* (NDTS), whose impact on debt levels is negative because firms try to reduce their tax burden by using NDTS instead of debt, thus avoiding unnecessary distress costs (Dammon & Senbet, 1988). In the case of SMEs, this factor may represent the main alternative to reducing tax burdens since SMEs do not usually use debt as a tax shield, given their lower profitability (D'Amato, 2020). In this sense, we expect a negative impact between NDTS and optimal debt level. This variable is measured as the ratio of depreciation to fixed assets of firm *i* in year *t* (Aybar-Arias et al., 2012; Lopez-Gracia & Mestre-Barbera, 2011).

(5) *SME size* (SIZE) is also a relevant factor since, as firm size increases, SMEs have more collateral guarantees and are more diversified, which translates into less risk for lenders (Titman & Wessels, 1988). Size is thus associated with a better reputation and positively influences SMEs' ability to achieve higher debt levels (Aybar-Arias et al.,

2012). A positive relationship is thus expected between SME size and optimal debt levels. This variable is measured as the natural logarithm of total sales of firm *i* in year *t* (Aybar-Arias et al., 2012).

(6) *Effective tax rate* (TAX), whose impact on debt levels is due to the deductibility of interest payments. In this sense, the use of debt as a source of financing has a clear advantage, i.e., a reduction in income tax. The effective tax rate is thus expected to have a positive influence on optimal debt (Lopez-Gracia & Sogorb-Mira, 2008). This variable is measured as the ratio of income tax paid to profits before taxes and after interest of firm *i* in year *t* (Serrasqueiro et al., 2012).

(7) *Liquidity* (LIQUID), whose impact tends to differ depending on debt maturity. In the long term, liquidity represents a guarantee for long-term lenders. Consequently, SMEs may decide to remain liquid in order to improve their long-term creditworthiness. In the short term, SMEs can use their most liquid assets to finance their business opportunities, thus reducing debt levels (D'Amato, 2020). In this sense, the impact of liquidity on optimal debt is negative (positive) in the case of short-term debt (long-term debt). This variable is measured as the ratio of current assets to current liabilities of firm *i* in year *t* (D'Amato, 2020).

(8) *SME age* (AGE) also influences debt level, since older SMEs have had more time to accumulate funds and thus have less need for external resources (Mac an Bhaird & Lucey, 2010). A negative association between age and optimal debt levels is therefore expected. This variable is measured as the natural log of the age of firm *i* in year *t* (D'Amato, 2020).

(9) *SME financial performance* (ROA). The most profitable businesses are expected to take on less debt since they are capable of generating funds internally (D'Amato, 2020; Fama & French, 2002). This effect is especially relevant within SMEs

since they are more likely to suffer financial constraints in credit markets –facing the typical problems of adverse selection and moral hazard– which makes them resort mainly to internal resources (Aybar-Arias et al., 2012). We can thus expect financial performance to negatively affect optimal debt. This variable is measured as the ratio of operating income to total assets of firm *i* in year *t* (Aybar-Arias et al., 2012; Lopez-Gracia & Sogorb-Mira, 2008).

In the second stage, the coefficients estimated from Equation 1 are used to predict optimal debt levels (D_{it}^{*}) for 2018-2020 –where those factors determining optimal debt are again included. Specifically, as mentioned above, 2018 and 2019 are referred to as the "pre-COVID" period, while 2020 is referred to as the "COVID" period. After predicting optimal levels, we calculate the difference between this optimal debt (D_{it}^{*}) and the real (observed) debt ($DEBT$) for these three years. Such prediction errors measure excess debt (i.e., the level of debt not explained by the main determining factors of debt levels). More specifically, we define excess total debt (EXCESS_TOTAL_DEBT) as the difference between the actual (observed) level of debt of firm *i* in year *t* and the optimal (estimated) debt level of that firm and in that year; excess short-term debt (EXCESS_ST_DEBT) as the difference between the actual (observed) level of short-term debt of firm *i* in year *t* and the optimal (estimated) debt level of that firm and in that year; and excess long-term debt (EXCESS_LT_DEBT) as the difference between the actual (observed) level of long-term debt of firm *i* in year *t* and the optimal (estimated) debt level of that firm and in that year. We expect excess debt in 2020 to differ significantly from zero due to the Spanish government's interventionist policy and we also expect possible increases in excess debt between 2020 and prior years to be different from zero.

3.3.- Efficiency in the allocation of public guarantees

We then examine whether the allocation of public guarantees has proved to be efficient or not –i.e., whether this aid has been allocated to SMEs that have suffered temporary distress after the COVID-19 pandemic. To address this issue, we regress excess debt for 2020 –calculated and defined as indicated in the previous Section 3.2 and which reflects the Spanish government's interventionist policy– on the annual variations of the main economic-financial indicators affected by COVID-19 and the nature of the distress suffered by SMEs, as stated in Equation 2. Following Baum et al. (2003), we also use a panel data method, but apply an extended instrumental variable estimation routine that provides generalized method of moments (GMM) estimation, introduced by Hansen (1982). This estimation allows for internally generated instruments –considering company history– in order to control endogeneity issues (Nadeem, 2022). It is also useful both for resolving many sources of endogeneity and for considering the potential dynamic nature of the relationships (Nadeem, 2022). We therefore deal with endogeneity by obtaining consistency in the presence of arbitrary heteroskedasticity and we test instrument subset validity through additional diagnostic tests.

$$EXCESS\ DEBT_{i,2020} = \beta_0 + \beta_1 \cdot \Delta RISK_{i,2019-2020} + \beta_2 \cdot \Delta GROWTH_{i,2019-2020} + \beta_3 \cdot \Delta NDTS_{i,2019-2020} + \beta_4 \cdot \Delta ROA_{i,2019-2020} + \beta_5 \cdot DISTRESS_{i,2020} + \beta_6 \cdot Control\ variables + e_{it} \quad (2)$$

As stated in Equation 2, our dependent variable is excess debt level –alternatively considering excess total ($EXCESS\_TOTAL\_DEBT_{it}$), short-term ($EXCESS\_ST\_DEBT_{it}$), and long-term debt ($EXCESS\_LT\_DEBT_{it}$), previously defined in Section 3.2. Moreover, our independent variables are the variations in the main economic factors that are potentially affected by this health crisis, i.e., the annual growth rate (between 2019 and 2020) in risk default, growth opportunities, non-debt tax shields, and performance. In this sense, $\Delta RISK_{i,2019-2020}$ refers to the variation experienced in risk default ratio –measured

as the absolute value of the variation of operating profits (Serrasqueiro et al., 2012)– between 2019 and 2020; $\Delta GROWTH_{i,2019-2020}$ refers to the variation experienced in growth opportunities ratio –measured as the annual growth rate of sales (D'Amato, 2020)– between 2019 and 2020; $\Delta NDTS_{i,2019-2020}$ refers to the variation experienced in NDTS –measured as the ratio of depreciation to fixed assets (Aybar-Arias et al., 2012; Lopez-Gracia & Mestre-Barbera, 2011)– between 2019 and 2020; and $\Delta ROA_{i,2019-2020}$ refers to the variation experienced in financial performance (ROA) –measured as the ratio of operating income to total assets (Aybar-Arias et al., 2012; Lopez-Gracia & Sogorb-Mira, 2008)– between 2019 and 2020. In this sense, allocation of public aid may be considered efficient when excess debt is negatively influenced by growth opportunities, non-debt tax shields, or performance, and when it is positively influenced by risk default.

In addition, and more importantly, we include as an independent variable the nature of the (potential) decline suffered by each SME –since this is required in order to determine whether public aid was indeed directed at SMEs who suffered a temporary downswing. The nature of distress ($DISTRESS_{it}$) is a dichotomous variable that takes the value 1 when SMEs suffer "temporary" distress, and the value 0 when they suffer "structural" distress. For this division, we use the z-score indicator, which is used as a measure of financial risk or distress within the SME context (Altman & Sabato, 2007; Dolz et al., 2019; Lagazio et al., 2021; McGuinness et al., 2018). Specifically –as stated in Equation 3– we used Altman's z-score model which, although initially designed by Altman (1968) for publicly traded firms, was later adapted for private firms by Altman & Sabato (2007).

$$Altman\ z-score_{it} = \sum 0.717 \cdot \frac{working\ capital_{it}}{total\ assets_{it}} + 0.847 \cdot \frac{retained\ earnings_{it}}{total\ assets_{it}} + 3.107 \cdot \frac{EBITDA_{it}}{total\ assets_{it}} + 0.42 \cdot \frac{book\ value\ of\ equity_{it}}{total\ liabilities_{it}} + 0.998 \cdot \frac{firm\ sales_{it}}{total\ assets_{it}} \quad (3)$$

Based on Equation 3, we use the sector-average z-score as the threshold. SMEs above this threshold in year *t* are considered as not suffering distress, while SMEs below or equal to this threshold in year *t* are considered as suffering distress. As can be seen in Table 2, we classify SMEs suffering "temporary" deterioration as those who did not suffer deterioration prior to COVID-19 but who did suffer deterioration due to the pandemic; while we consider SMEs that suffer "structural" deterioration to be those who suffered deterioration prior to COVID-19 and who continued to suffer it as a result of the pandemic. In any other case, we consider that the SME does not suffer deterioration and it is therefore not taken into account for this analysis. We thus expect β_5 to be significant and positive, since excess debt (linked to liquidity injections) should be related to SMEs suffering temporary distress –which would imply efficient allocation of public guarantees in that the injection of liquidity is aimed at counteracting short-term deterioration, as required by the call for this public aid.

Insert Table 2 about here

4.- Results

4.1.- Descriptive statistics, correlations, and temporal evolution of the main variables

Table 3 shows the main statistics of our variables. In average terms, Spanish SMEs have a level of total debt equal to 29.19% –where 10.82% corresponds to short-term debt and 18.36% to long-term debt. Furthermore, the risk of bankruptcy (measured through the Altman z-score) shows an average value of 2.74, which places our SMEs within a "grey zone" –with a slight risk of suffering insolvency. Moreover, the liquidity ratio shows an average value of 1.89. However, its high standard deviation indicates high dispersion among data. Finally, Table 3 also includes the statistics of the remaining determining factors of optimal debt.

Insert Table 3 about here

Beyond showing descriptive statistics, analyzing how the main debt, liquidity, and solvency indicators evolved year after year is of specific interest. Of particular importance is examining the changes that occurred between 2019 and 2020 so as to determine the effects of the COVID-19 pandemic. Table 4 shows a large increase in total debt levels between 2019 and 2020, where a growth of about five percentage points is experienced. This increase –which means returning to debt levels close to those experienced after the last economic recession of 2008– may be conditioned by the interventionist policy deployed by the Spanish government to mitigate the effect of COVID-19. By considering debt maturity, Table 4 shows how, while long-term debt experiences substantial growth between 2019 and 2020 (from 16.00% to 21.68%), short-term debt decreases slightly (from 11.56% to 9.37%), which can also be seen in Figure 1. This different evolution of short- and long-term debt is caused by the change in debt structure –defined as the ratio of long-term liabilities to short-term liabilities of firm *i* in year *t*– due to the substitution of bank guarantees (short-term) for public guarantees (long-term) –as seen in Figure 2.

Insert Table 4 about here

Table 4 also shows the temporal evolution of the z-score and liquidity ratio. We see a drop in the z-score between 2019 and 2020, which translates to an increase in SME bankruptcy risk due to the COVID-19 pandemic. This interrupts the favorable trend this indicator had experienced following the last recession. For its part, the liquidity ratio experienced a marked increase between 2019 and 2020 –much higher than any increase in this period– and that may be due to the Spanish government's interventionist policy, which involved large injections of liquidity in an effort to mitigate the unfavorable economic consequences of the COVID-19 pandemic.

Insert Figures 1 and 2 about here

Finally, Table 5 contains the matrix of correlations of the variables included in this study. Prominent are the correlations between debt variables –in particular the positive correlation between total debt and short/long-term debt. The negative correlation between short-term and long-term debt is also noticeable. For its part, there are negative correlations between debt variables and z-score, and between debt variables and liquidity ratio. The VIF values show that no multicollinearity problems were identified.

Insert Table 5 about here

4.2.- Effects of the Spanish government's interventionist policy on debt levels

Table 6 contains the estimation of optimal debt model (from Equation 1) for the control period (2011-2017). In our sample, the determining factors for optimal debt levels display the expected behavior, in line with prior literature –considering both total debt, and when distinguishing between short- and long-term debt. More specifically, regardless of debt maturity, the determining factors that positively influence optimal debt are effective tax rate, firm size, and debt levels of the previous year, while growth opportunities, non-debt tax shields, firm age, and probability exert a negative influence. Moreover, the impact of default risk, tangibility, and the liquidity rate vary depending on debt maturity –i.e., while these factors negatively influence short-term debt levels, their influence is positive in terms of long-term debt.

Insert Table 6 about here

We then compare actual (observed) debt and optimal debt for the 2018-2020 period in order to obtain the levels of excess debt for those years. As noted below, 2018 and 2019 refer to the "pre-COVID" period, while 2020 refers to the "COVID" period.

Table 7 shows the means for optimal debt levels (calculated from the coefficients estimated for our control period in Table 6) and for excess debt levels (calculated from the difference between actual and optimal debt). As can be seen in Table 7, we see how optimal total and long-term debt levels for 2020 are slightly higher than for 2018 and 2019, while optimal short-term debt levels for 2020 are slightly lower than in previous years. For their part, we also see how excess debt levels are higher and considerably different from the optimum in 2020. Moreover, after calculating the differences regarding excess debt, we see how variations are much more pronounced during the COVID period. Specifically, excess long-term debt increases by five percentage points (from -0.62 in 2019 to 4.63 in 2020), while excess short-term debt falls by about two percentage points (from 1.17 in 2019 to -1.06 in 2020).

In addition, Table 7 contains several different tests to check whether debt excesses are statistically different from 0 for 2020 (see column III) and whether the differences in means are statistically significant between pre-COVID and COVID periods (see columns IV-V). Results show that excess debt is significantly different from zero after the onset of the pandemic, which means that observed debt levels differ from optimal ones. Moreover, excess short-term debt was positive and excess long-term debt was negative for 2018-2019. Nevertheless, as a consequence of COVID-19, excess short-term debt turned negative in 2020 while excess long-term debt turned positive. This behavior is consistent with the change experienced by debt structure in 2020 (see Figure 2), disproportionately increasing excess long-term debt, which has meant that in global terms total excess debt has also increased. In addition, after testing the differences in means in the pre-COVID period ($\Delta_{2019\text{-}2018}$) and in the COVID period ($\Delta_{2020\text{-}2019}$), we find no significant differences in excess debt means in the period prior to the pandemic, while these differences do prove to be statistically significant after the onset of COVID-19.

Insert Table 7 about here

More visually, the progression of excess debt in the 2018-2020 period is shown in Figure 3, where a noticeable increase in excess long-term debt is evident, whereas excess short-term debt falls. All of this allows us to state that, after the Spanish government interventionist policy, levels of excess debt increased in 2020, deviating from the optimum. This is especially marked in the case of excess long-term debt –which is in fact the time horizon that characterizes the public guarantees aimed at mitigating the adverse economic effects caused by this pandemic. For its part, the drop in excess short-term debt in 2020 may be explained by the transformation of short-term banking guarantees into long-term public guarantees.

Insert Figure 3 about here

As a complement to the previous analyses, and in order to provide robustness to our results, in Table 8 we perform a new regression of optimal debt on its main determining factors considering the whole period (i.e., 2011-2020), and introducing a dummy variable to control the specific role played by the year 2020 within this panel data regression[4]. As can be seen, the behavior of the main determinants of optimal debt is identical to that obtained in Table 6. In addition, the impact of year 2020 is positive and significant in the case of total and long-term debt, while this impact turns negative in the case of short-term debt. These results are consistent with those obtained in Table 7 and again show the effect of the Spanish government's interventionist policy on debt levels as well as the change experienced by debt structure, thereby providing robustness to our prior evidence.

[4] For this purpose, a dummy variable is created that takes the value 1 when the year is 2020, and the value 0 when the year is any other than 2020.

Insert Table 8 about here

After carrying out this analysis by sectors, we see that all of them display similar behavior in terms of excess debt –as shown in Table 9 and Figures 4 a-c. The largest increases in excess long-term debt were experienced in commerce, hotel, and catering (sector 6) and in education, health, and other services (sector 9). However, the increase in excess long-term debt is less striking in transport and communications (sector 07). As regards excess short-term debt, the biggest drop occurs in manufacturing (sector 4) and commerce, hotel, and catering (sector 6), while the least impact occurs in education, health, and other services (sector 9). These results are consistent with the data offered by the ICO regarding the distribution of guarantees by sector (ICO, 2020). Moreover, we see how debt excesses are significantly different from zero in 2020 (see column III). In most sectors, the change experienced in debt structure is similar to that previously mentioned for Table 07, i.e., the health crisis tended to trigger long-term debt excesses while turning short-term debt excesses into negative ones. Finally, as expected, the differences in means for all excess debt levels are statistically significant in the COVID period ($\Delta_{2019\text{-}2020}$), while there are no significant differences in excess debt means in the pre-pandemic period ($\Delta_{2018\text{-}2019}$).

Insert Table 9 and Figures 4 about here

4.3.- Analysis of efficiency in the allocation of public guarantees

Table 10 shows those factors that may explain changes in the levels of excess (total, short-term, and long-term) debt in 2020 after the outbreak of the COVID-19 pandemic. We see that excesses in total debt are mainly related to a drop in firm profitability. For its part, excessive long-term debt (which is more relevant given that this is the time horizon for public guarantees/aid) is related with an increase in default risk

and a decline in firm profitability. It would therefore initially appear that this public aid was directed towards distressed companies in the sense that there is a positive relationship between excess long-term debt (potentially explained by the injection of liquidity due to the government's interventionist policy) and SMEs' economic-financial downturn.

Insert Table 10 about here

After verifying that this injection of liquidity was indeed aimed at SMEs who experienced distress, it is necessary to go a step further and to assess to what extent these SMEs suffered either temporary or structural distress. This is a relevant issue since, in line with the objective of these public guarantees, such support should have been aimed at remedying temporary problems rather than solving structural problems. The results shown in Table 11 indicate that banks (who were in charge of distributing Spanish government support) were unable to direct public aid to the SMEs that suffered a temporary downswing due to this health crisis. In fact, contrary to our expectations, our results show that excess debt is negatively related to the temporary nature of the decline, which implies that SMEs suffering a temporary downswing are less likely to have excess debt (which may be explained by the lower injection of liquidity received). In other words, excess debt is more related to SMEs who suffered structural distress. Adequate discriminatory capacity was not therefore exercised when allocating these public guarantees/aid, such that the aim of directing said support towards SMEs who suffered a temporary decline caused by COVID-19 was not fulfilled.

Insert Table 11 about here

5.- Conclusions

At a global level, major efforts had to be made by national governments to cushion the adverse effects of the COVID-19 pandemic (Kahn & Wagner, 2021) since most firms

saw their normal functioning and operations altered, with some even teetering on the brink of bankruptcy (Cressy, 2006; Ghosal & Ye, 2015). Among these negative effects, the liquidity and solvency crisis –resulting from the abrupt drop in firms' sales and turnover– deserve special attention (Almeida, 2021; Blanco et al., 2021; Demmou et al., 2021; He et al., 2020). These government efforts mainly consisted of adopting public policies to contain firms' economic and financial distress and so prevent a further decline in the economy. In Spain, one of the key policies was the public guarantee policy, whose aim was to grant credit to companies so that they could continue to operate as normally as possible (ICO, 2020; *Real Decreto-Ley 25/2020, de 3 de julio, de medidas urgentes para apoyar la reactivación económica y el empleo*, 2020). This credit –targeted strictly at remedying short-term or temporary distress– was mainly directed towards SMEs and self-employed workers (ICO, 2020). In this context, by using a sample of Spanish SMEs, this work seeks, on the one hand, to gauge the effect of the liquidity injection (derived from this public policy) on SMEs' optimal debt, and on the other hand to examine to what extent the allocation of this public support (managed by banks) did or did not prove to be efficient, i.e., whether or not it managed to remedy temporary distress.

Our results lead to two important conclusions: firstly, these public guarantees triggered an increase in abnormal debt levels (in particular, in SMEs' long-term debt); secondly, their allocation was not efficient, since they were not mainly directed towards SMEs who suffered a temporary downswing caused by COVID-19. Based on these results, several reflections, which offer interesting contributions to the literature, may be made. First, this paper shows how excess government intervention in the economy (in this case, through a large injection of liquidity) leads to significant alterations in SMEs' optimal debt thresholds, which increases the risk of default when repayment is due. These debt excesses are mainly due to the increase in long-term debt in 2020 –since public

guarantees have a maturity of approximately five years. Although these public guarantees are useful in terms of preventing certain SMEs from going under (or, at least, reducing the severity of their economic decline), it is no less true that they have generated a distortion in optimal debt levels. One possible reason underlying this is that the injection of liquidity was extremely excessive –in fact, this program guaranteed over €64,120.8 million by the end of 2020 in SMEs (ICO, 2020). A more conservative stance should have been adopted by the Spanish government.

Second, this study contributes to the literature by showing how public guarantees were not mainly directed towards SMEs who suffered a decline classified as "temporary". This is not consistent with the main aim sought by the Spanish government –since this support was not meant to be allocated simply to firms suffering any type of distress. Rather, the spirit of this public policy was to channel liquidity towards firms suffering temporary downswings caused by the health crisis (ICO, 2020). We can thus state that allocation of this public aid was not efficient in the sense that, despite having been granted to certain weakened organizations, these companies did not suffer a short-term downswing. Third, allocation of public aid tends to be less efficient when channeled by private agents –such as banks– and when there are no clear criteria about which companies must benefit. In this regard, we see how banks, when handling the allocation of this "public" credit, tend to adopt riskier and more opportunistic behavior –compared to the behavior expected when managing private bank loans (Cordella et al., 2018; Gropp et al., 2014; Leonello, 2018), thereby adding fresh evidence in the context of a health crisis such as the COVID-19 pandemic.

Moreover, this paper offers several practical implications. First, as regards SMEs, we highlight the importance of increasing corporate responsibility and awareness before resorting to such aid. In other words, the request for public support should be consistent

with the distress suffered by each individual firm and with its ability to repay the amount requested, since taking on such major financial commitments increases the risk of bankruptcy. Second, at the government level, our results reveal that an excessive injection of liquidity, despite helping to reduce SMEs' liquidity crises, generates a substantial increase in debt levels, which translates to a greater risk of insolvency upon expiration of these guarantees. In this regard, some Spanish newspaper headlines have already expressed particular concern about the potential appearance of new default risks. Such headlines include "First alarms about the latent late payment in banking due to ICO loans" (Romero, 2022) or "The ICO 'bomb': the Government will not know the real late payment" (Cabrera, 2022). Moreover, when channeling of public aid is left in the hands of banks, far clearer and detailed guidelines are needed to avoid discretion in the allocation of public support. Greater delimitation of criteria might have favored support being channeled towards SMEs that were indeed temporarily suffering as a result of the COVID-19 pandemic. Finally, as for the banks, they should adopt a more prudent and co-responsible attitude when allocating public aid, since they tend to assume excessive risks and to act somewhat recklessly, which leads to a delicate situation that ends up being unfavorable both for the SMEs themselves and for the economy as a whole.

Finally, this research is not exempt from limitations, from which interesting lines for future research emerge. First, this study focuses on Spain and analyzes the impact of a specific public policy. Future studies might examine the impact of similar public policies using a cross-country approach. Second, this work focuses on the effects of public guarantees on debt levels in 2020. Future studies might expand this time horizon, in addition to exploring what impact they have on other relevant economic-financial factors for businesses. Third, this paper examines the effect of public guarantees on SMEs. Future studies might therefore extend this analysis by considering a sample of larger companies.

Finally, this study focuses on SMEs which belong to the sectors that concentrate most of this public funding. However, we are unable to specifically identify which SMEs received this support. This information was requested from the ICO, but the latter body did not provide the data due to its data protection policy. If able to identify which companies (in particular, SMEs) receive public guarantees, future studies might delve into their economic-financial viability and explore their capacity to meet repayment commitments.

References

Abu Hatab, A., Lagerkvist, C. J., & Esmat, A. (2021). Risk perception and determinants in small- and medium-sized agri-food enterprises amidst the COVID-19 pandemic: Evidence from Egypt. *Agribusiness*, *37*(1), 187–212. https://doi.org/10.1002/agr.21676

Almeida, H. (2021). Liquidity management during the Covid-19 pandemic. *Asia-Pacific Journal of Financial Studies*, *50*(1), 7–24. https://doi.org/https://doi.org/10.1111/ajfs.12322

Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, *23*(4), 589–609. https://doi.org/10.2307/2978933

Altman, E. I., & Sabato, G. (2007). Modelling Credit Risk for SMEs: Evidence from the U.S. Market. *Abacus*, *43*(3), 332–357. https://doi.org/https://doi.org/10.1111/j.1467-6281.2007.00234.x

Apergis, N., Danuletiu, D., & Xu, B. (2022). CDS spreads and COVID-19 pandemic. *Journal of International Financial Markets, Institutions and Money*, *76*, 101433. https://doi.org/https://doi.org/10.1016/j.intfin.2021.101433

Ashley, A. S., & Yang, S. S. M. (2004). Executive compensation and earnings persistence. *Journal of Business Ethics*, *50*(4), 369–382. http://www.jstor.org/stable/25075203

Aybar-Arias, C., Casino-Martinez, A., & Lopez-Gracia, J. (2012). On the adjustment speed of SMEs to their optimal capital structure. *Small Business Economics*, *39*(4), 977–996. https://doi.org/10.1007/s11187-011-9327-6

Ayotte, K., Hotchkiss, E. S., & Thorburn, K. S. (2013). Governance in financial distress and bankruptcy. In M. Wright, D. S. Siegel, K. Keasy, & I. Filatotchev (Eds.),

Oxford Handbook of Corporate Governance (pp. 159–288). Oxford University Press.

Baily, M. N., Bartelsman, E. J., & Haltiwanger, J. (2001). Labor productivity: Structural change and cyclical dynamics. *Review of Economics and Statistics*, *83*(3), 420–433. https://doi.org/10.1162/00346530152480072

Balgati, B. (2001). *Economic analysis of panel data*. Wiley.

Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *Stata Journal*, *3*(1), 1–31.

Belghitar, Y., & Khan, J. (2013). Governance mechanisms, investment opportunity set and SMEs cash holdings. *Small Business Economics*, *40*(1), 59–72. https://doi.org/10.1007/s11187-011-9366-z

Belghitar, Y., Moro, A., & Radic, N. (2022). When the rainy day is the worst hurricane ever: the effects of governmental policies on SMEs during COVID-19. *Small Business Economics*, *58*(2), 943–961. https://doi.org/10.1007/s11187-021-00510-8

Blanco, R., Mayordomo, S., Menéndez, Á., & Mulino, M. (2021). *Impact of the COVID-19 crisis on Spanish firms' financial vulnerability* (No. 2119; Banco de España).

Cabrera, D. (2022). *La "bomba" de los ICO: el Gobierno no conocerá hasta septiembre la morosidad real*. https://www.vozpopuli.com/economia_y_finanzas/banco-de-espana-ico-sept.html

Carvalho, D. (2014). The real effects of Government-Owned Banks: Evidence from an emerging market. *The Journal of Finance, 69*(2), 577–609.

Chen, D., Li, L., Liu, X., & Lobo, G. J. (2018). Social trust and auditor reporting conservatism. *Journal of Business Ethics*, *153*(4), 1083–1108. https://doi.org/10.1007/s10551-016-3366-5

Chu, Y. (2017). Shareholder litigation, shareholder–creditor conflict, and the cost of bank loans. *Journal of Corporate Finance*, *45*, 318–332. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2017.05.005

Cordella, T., Dell'Ariccia, G., & Marquez, R. (2018). Government guarantees, transparency, and bank risk taking. *IMF Economic Review*, *66*(1), 116–143. https://doi.org/10.1057/s41308-018-0049-5

Core, F., & De Marco, F. (2021). *Public guarantees for small businesses in Italy during COVID-19* (CEPR Discussion Paper No. DP15799). https://ssrn.com/abstract=3784039

Corredera-Catalán, F., di Pietro, F., & Trujillo-Ponce, A. (2021). Post-COVID-19 SME financing constraints and the credit guarantee scheme solution in Spain. *Journal of Banking Regulation*, *22*(3), 250–260. https://doi.org/10.1057/s41261-021-00143-7

Cressy, R. (2006). Determinants of small firms survival and growth. In M. Casson, B. Yeung, A. Basu, & N. Wadeson (Eds.), *The Oxford Handbook of Entrepreneurship* (pp. 161–193). Oxford University Press.

D'Amato, A. (2020). Capital structure, debt maturity, and financial crisis: empirical evidence from SMEs. *Small Business Economics*, *55*(4), 919–941. https://doi.org/10.1007/s11187-019-00165-6

Dammon, R. M., & Senbet, L. W. (1988). The effect of taxes and depreciation on corporate investment and financial leverage. *The Journal of Finance*, *43*(2), 353–373.

Demmou, L., Franco, G., Calligaris, S., & Dlugosch, D. (2021). *Liquidity shortfalls during the COVID-19 outbreak: Assessment and policy responses* (No. 1647; OECD Economics Department Working Papers). https://doi.org/10.1787/581dba7f-en

Dolz, C., Iborra, M., & Safón, V. (2019). Improving the likelihood of SME survival during financial and economic crises: The importance of TMTs and family ownership for ambidexterity. *BRQ Business Research Quarterly*, *22*(2), 119–136. https://doi.org/https://doi.org/10.1016/j.brq.2018.09.004

Elnahass, M., Trinh, V. Q., & Li, T. (2021). Global banking stability in the shadow of Covid-19 outbreak. *Journal of International Financial Markets, Institutions and Money*, *72*, 101322. https://doi.org/https://doi.org/10.1016/j.intfin.2021.101322

Fairlie, R., & Fossen, F. M. (2022). The early impacts of the COVID-19 pandemic on business sales. *Small Business Economics*, *58*(4), 1853–1864. https://doi.org/10.1007/s11187-021-00479-4

Fama, E., & French, K. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies*, *15*, 1–33.

Gazaniol, A., & Lê, M. (2021). The impact of public loan guarantees on banks' risk taking and firms' growth: evidence from France. *Economie Prevision*, *218*(1), 67–104.

Ghosal, V., & Ye, Y. (2015). Uncertainty and the employment dynamics of small and large businesses. *Small Business Economics*, *44*(3), 529–558. https://doi.org/10.1007/s11187-014-9614-0

Gormsen, N. J., & Koijen, R. S. J. (2020). Coronavirus: Impact on Stock Prices and Growth Expectations. *The Review of Asset Pricing Studies*, *10*(4), 574–597. https://doi.org/10.1093/rapstu/raaa013

Gropp, R., Gruendl, C., & Guettler, A. (2014). The impact of public guarantees on bank risk-taking: Evidence from a natural experiment. *Review of Finance*, *18*(2), 457–488. https://doi.org/10.1093/rof/rft014

Hansen, L. P. (1982). Large sample properties of generalized-method of moments estimators. *Econometrica*, *50*(4), 1029–1054. https://doi.org/10.2307/1912775

He, Q., Liu, J., Wang, S., & Yu, J. (2020). The impact of COVID-19 on stock markets. *Economic and Political Studies*, *8*(3), 275–288. https://doi.org/10.1080/20954816.2020.1757570

Hovakimian, A., Opler, T., & Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative Analysis*, *36*(1), 1–24. https://doi.org/10.2307/2676195

ICO. (2020). *Línea de Avales Inversión RDL 25/2020*. https://www.ico.es/web/guest/ico/linea-de-avales-inversion-real-decreto-ley-25/2020

Kahn, C. M., & Wagner, W. (2021). Liquidity provision during a pandemic. *Journal of Banking & Finance*, *133*, 106152. https://doi.org/https://doi.org/10.1016/j.jbankfin.2021.106152

Khwaja, A., & Mian, A. (2005). Do lenders favor politically connected firms? Rent provision in an emerging financial market. *The Quarterly Journal of Economics*, *120*(4), 1371–1411.

Lagazio, C., Persico, L., & Querci, F. (2021). Public guarantees to SME lending: Do broader eligibility criteria pay off? *Journal of Banking & Finance*, *133*, 106287. https://doi.org/https://doi.org/10.1016/j.jbankfin.2021.106287

Leonello, A. (2018). Government guarantees and the two-way feedback between banking and sovereign debt crises. *Journal of Financial Economics*, *130*(3), 592–619. https://doi.org/https://doi.org/10.1016/j.jfineco.2018.04.003

Lopez-Gracia, J., & Mestre-Barbera, R. (2011). Tax effect on Spanish SME optimum debt maturity structure. *Journal of Business Research*, *64*(6), 649–655. https://doi.org/10.1016/j.jbusres.2010.06.001

Lopez-Gracia, J., & Sogorb-Mira, F. (2008). Testing trade-off and pecking order theories financing SMEs. *Small Business Economics*, *31*(2), 117–136. https://doi.org/10.1007/s11187-007-9088-4

Lu, Y., Wu, J., Peng, J., & Lu, L. (2020). The perceived impact of the Covid-19 epidemic: Evidence from a sample of 4807 SMEs in Sichuan Province, China. *Environmental Hazards*, *19*(4), 323–340. https://doi.org/10.1080/17477891.2020.1763902

Mac an Bhaird, C., & Lucey, B. (2010). Determinants of capital structure in Irish SMEs. *Small Business Economics*, *35*(3), 357–375. https://doi.org/10.1007/s11187-008-9162-6

McGuinness, G., Hogan, T., & Powell, R. (2018). European trade credit use and SME survival. *Journal of Corporate Finance*, *49*, 81–103. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2017.12.005

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147–175. https://doi.org/https://doi.org/10.1016/0304-405X(77)90015-0

Nadeem, M. (2022). Board gender diversity and managerial obfuscation: Evidence from the readability of narrative disclosure in 10-K reports. *Journal of Business Ethics*, *179*(1), 153–177. https://doi.org/10.1007/s10551-021-04830-3

Padhan, R., & Prabheesh, K. P. (2021). The economics of COVID-19 pandemic: A survey. *Economic Analysis and Policy*, *70*, 220–237. https://doi.org/https://doi.org/10.1016/j.eap.2021.02.012

Real Decreto-ley 25/2020, de 3 de julio, de medidas urgentes para apoyar la reactivación económica y el empleo. (2020). https://www.boe.es/buscar/act.php?id=BOE-A-2020-7311

Romero, A. (2022). *Primeras alarmas sobre la morosidad latente en la banca por los créditos ICO*. https://www.capitalmadrid.com/2022/6/14/62621/primeras-alarmas-sobre-la-morosidad-latente-en-la-banca-por-los-creditos-ico.html

Sapienza, P. (2004). The effects of government ownership on bank lending. *Journal of Financial Economics*, *72*(2), 357–384.

Sarker, M. R., Rahman, S. M. A., Islam, A., Bhuyan, M. F. F., Supra, S. E., Ali, K., & Noor, K. M. A. (2022). Impact of COVID-19 on Small- and Medium-sized Enterprises. *Global Business Review*, *Forth*. https://doi.org/10.1177/09721509221093489

Serrasqueiro, Z., Nunes, P. M., & da Silva, J. V. (2012). Are financing decisions of family-owned SMEs different? Empirical evidence using panel data. *Journal of Management & Organization*, *18*(3), 363–382.

Sun, Y., Zeng, X., Zhao, H., Simkins, B., & Cui, X. (2022). The impact of COVID-19 on SMEs in China: Textual analysis and empirical evidence. *Finance Research Letters*, *45*, 102211. https://doi.org/https://doi.org/10.1016/j.frl.2021.102211

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, *43*(1), 1–19.

Wald, J. K. (1999). How firm characteristics affect capital structure: An international comparison. *Journal of Financial Research*, *22*(2), 161–187. https://doi.org/https://doi.org/10.1111/j.1475-6803.1999.tb00721.x

Wang, Y. (2016). What are the biggest obstacles to growth of SMEs in developing countries? An empirical evidence from an enterprise survey. *Borsa Istanbul Review*, *16*(3), 167–176. https://doi.org/https://doi.org/10.1016/j.bir.2016.06.001

Wiggins, J. B. (1990). The Relation between risk and optimal debt maturity and the value of leverage. *Journal of Financial and Quantitative Analysis*, *25*(3), 377–386. https://doi.org/DOI: 10.2307/2330702

Zecchini, S., & Ventura, M. (2009). The impact of public guarantees on credit to SMEs. *Small Business Economics*, *32*(2), 191–206. https://doi.org/10.1007/s11187-007-9077-7

Zhang, D., & Zheng, W. (2022). Does COVID-19 make the firms' performance worse? Evidence from the Chinese listed companies. *Economic Analysis and Policy*, *74*, 560–570. https://doi.org/https://doi.org/10.1016/j.eap.2022.03.001

Zhu, W., Zhang, P., Li, P., & Wang, Z. (2020). Firm crisis, government support and policy efficiency under the epidemic shock: Evidence from two waves of questionnaire on SMEs. *Management World*, *36*(04), 13–26.