



“Survival dynamics of SMES supported by credit guarantee schemes: Insights from Morocco”

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| ARTICLE INFO | Oussouadi Kamal and Cherkaoui Kenza (2024). Survival dynamics of SMES supported by credit guarantee schemes: Insights from Morocco. <i>Banks and Bank Systems</i> , 19(1), 86-98. doi: <a href="https://doi.org/10.21511/bbs.19(1).2024.08">10.21511/bbs.19(1).2024.08</a> |
| DOI          | <a href="http://dx.doi.org/10.21511/bbs.19(1).2024.08">http://dx.doi.org/10.21511/bbs.19(1).2024.08</a>  |
| RELEASED ON  | Tuesday, 20 February 2024  |
| RECEIVED ON  | Thursday, 07 September 2023  |
| ACCEPTED ON  | Wednesday, 17 January 2024   |
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| JOURNAL      | "Banks and Bank Systems"   |
| ISSN PRINT   | 1816-7403  |
| ISSN ONLINE  | 1991-7074  |
| PUBLISHER    | LLC “Consulting Publishing Company “Business Perspectives”   |
| FOUNDER      | LLC “Consulting Publishing Company “Business Perspectives”   |



NUMBER OF REFERENCES

50



NUMBER OF FIGURES

1



NUMBER OF TABLES

5

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10,  
Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 7<sup>th</sup> of September, 2023

**Accepted on:** 17<sup>th</sup> of January, 2024

**Published on:** 20<sup>th</sup> of February, 2024

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2024

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**Conflict of interest statement:**

Author(s) reported no conflict of interest

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# SURVIVAL DYNAMICS OF SMEs SUPPORTED BY CREDIT GUARANTEE SCHEMES: INSIGHTS FROM MOROCCO

## Abstract

The aim of this study is to assess the viability of SMEs that had benefited from bank loans backed by credit guarantee schemes. A quantitative approach has been adopted by the study. The sample comprised 398 Moroccan SMEs that had benefited from this type of financing, and the primary objective was to examine their survival over the ten years following the obtaining of these guarantees. Logistic regression was used to reflect several results. The results of the study highlight several factors influencing the probability of survival of these SMEs. Larger amounts of credit promote financial resilience and growth, thereby increasing the likelihood of business survival. Business profitability is a key factor in the likelihood of survival. Profitable businesses attract more investors and lenders, improving access to credit and increasing survival prospects. Contrary to some studies, high levels of debt do not appear to reduce the probability of survival. Similarly, repayment capacity showed no significant link with survival, suggesting the importance of other non-financial factors. Mature and well-considered management decision making is associated with a higher probability of survival. Well-thought-out decisions promote the long-term viability of businesses. Small SMEs also have a good chance of survival because of their rapid adaptability. A manager's active participation in a company's capital is linked to a higher probability of survival. This underlines the importance of the personal involvement of the manager and of solid governance.

## Keywords

SME survival, credit guarantee schemes, government  
credit guarantees, Morocco

## JEL Classification

G21, G23, G38, M13

## INTRODUCTION

The crucial importance of small and medium-sized enterprises (SMEs) as drivers of innovation, job creation and economic growth is undeniable, and Morocco is no exception. SMEs play a fundamental role in the economic vitality and social development of nations around the world. As such, the study of SME viability is of particular relevance to policy makers, financial institutions, entrepreneurs and researchers. Nevertheless, despite their important role, SMEs face substantial challenges that can undermine their long-term persistence. Obtaining finance is often a major obstacle for these entities. To overcome this problem and promote economic development, governments have introduced credit guarantee schemes. These mechanisms aim to secure investment and boost creditor confidence by reducing the risks inherent in SMEs. With this in mind, the study undertaken aims to assess the viability of SMEs that have benefited from government credit guarantee and to dissect the factors that influence their ability to survive in the long term.

Traditional lenders are sometimes reluctant to lend to SMEs because of their limited credit history, limited resources, and perceived risk. This is where credit guarantee schemes come in – security arrange-

ments put in place by governments, public or private financial institutions, or even international organizations. These guarantees aim to mitigate the risks perceived by lenders, thereby providing an incentive to grant loans to SMEs. Obtaining loans backed by credit guarantee schemes can have a considerable impact on the survival of SMEs, particularly at critical stages in their development. By eliminating a fraction of the risk perceived by lenders, these guarantees increase the likelihood of approval of SME loan applications, thereby guaranteeing the cash flow essential to support their operations and expansion. Furthermore, these guarantees have the effect of reducing the risk of default for lenders, which can help to maintain financial stability within SMEs. This increased stability allows companies to better manage their cash flow and focus their efforts on developing their business, rather than being preoccupied with financial pressures. In addition, the provision of government credit guarantee can increase the confidence of potential investors, leading to more investment, partnerships and growth opportunities, all of which contribute to the long-term viability of SMEs.

## 1. LITERATURE REVIEW

De la Torre and Schmukler (2007) discuss emerging capital markets and globalization, highlighting how credit guarantee schemes can positively influence the probability of firm survival by increasing lender confidence and reducing perceived risks. Hallberg (2000) explored market-oriented strategies for SMEs, highlighting the role of credit guarantee schemes in mitigating information asymmetries and thus increasing the chances of survival. Beck et al. (2011) highlighted the importance of credit guarantee schemes in facilitating SMEs' access to bank finance, which led to higher survival rates for those benefiting from them. Hossain et al. (2023) evaluated the effect of credit guarantee schemes on bank lending to SMEs, showing that the program increased access to finance and improved the probability of survival for SMEs. Khwaja and Mian (2008), Korajczyk and Levy (2003), Aghion et al. (2007), Gropp et al. (2014), Ogunmuyiwa (2022), Bakhtiari et al. (2020), Sallousse and Seddiki (2021), and Peprah (2016) have all reached similar conclusions: credit guarantee schemes play an important role in supporting business survival. These guarantees alleviate credit constraints, facilitate market entry, influence interest rates and the availability of credit, and strengthen the economic resilience of businesses, particularly in periods of uncertainty. Overall, the importance of credit guarantee schemes for the probability of survival of businesses, and SMEs in particular, can be emphasized. These guarantees can positively influence access to finance, reduce perceived risks, ease credit constraints, and strengthen the economic resilience of SMEs, thereby contributing to their long-term sustainability.

The results of Harhoff and Körting's (1998) study of lending relationships in Germany revealed that firms with substantial access to amounts of credit were able to build up an additional liquidity cushion to cope with periods of turbulence, thereby enhancing their chances of survival. In line with this observation, Duarte et al. (2018) raised the influence of loan size on the probability of corporate default. Giesecke's (2004) analysis of credit risk modelling highlighted the fact that companies with access to substantial financing could not only invest in growth projects, but also diversify their areas of activity, thus contributing positively to their longevity. It is interesting to note that the size of loans is correlated with a tangible improvement in company performance, as highlighted by Aldaba (2012) and Wanambisi (2013). The considerations raised by Stein (2002), relating to the production of information and the allocation of capital, shed new light. The author put forward the idea that companies with greater access to credit were able to invest in high-potential projects, giving their viability greater prospects. By examining the law and economics of transactions, Djankov et al. (2008) highlighted a crucial element. Companies with access to substantial credit funds had the flexibility to face financial challenges, which had a positive impact on their sustainability. Beck and Demirgüç-Kunt (2006) offered a relevant perspective on access to finance for SMEs. They found that SMEs with access to larger amounts of credit were better able to invest in development projects, thereby strengthening their resilience. Petersen and Rajan (1995) looked at the effect of competition on lending relationships. Their study highlighted the fact that companies with greater access to substantial amounts of credit had greater financial leeway to deal with unforeseen situations, which helped to increase their chances of sur-

vival. In this respect, it should be noted that access to larger amounts of credit can give businesses the financial flexibility they need to invest in growth, meet economic challenges and improve their long-term financial stability.

Petersen and Rajan (1995) examined the effect of competition on the dynamics of lending, raising the idea that companies with increased profitability could be perceived as less risky in the eyes of lenders. This favorable perception could therefore increase their opportunities to obtain credit, with a consequent positive impact on their survival. The relationship between profitability and growth has also been explored by Rivard (2014). His review sought to determine the preponderance between growth and profitability, concluding that profitability outweighed growth in importance. Deloof (2003) looked at the impact of working capital management on firm profitability. He found that companies with higher profitability can manage their working capital more effectively, which has a positive influence on their ability to survive. In the area of access to business finance, Beck and Demirgüç-Kunt (2006) found that companies with higher profitability were also better able to repay their debts. This greater ability to repay could in turn increase their access to credit, thereby increasing their chances of survival. According to Delmar et al. (2013), the main objective of young SMEs is to maximize their survival rather than to seek profitability. Cassar (2004) found that SMEs generating higher profitability tended to be more attractive to investors and lenders, which can improve their access to credit and increase their probability of survival. Other authors have explored the complex relationship between the amount of bank lending and firm survival. Boyer and Blazy (2014) raised the idea of an inverted U-curve relationship between these two factors. Thus, higher profitability for businesses receiving loans can greatly improve their survival prospects. This increased profitability strengthens the confidence of lenders and investors, promotes optimal cash flow management, and reinforces the company's ability to honor its financial commitments, thus contributing to its long-term stability.

Titman and Wessels (1988) focused on the determinants of the choice of capital structure. Their findings highlighted that firms opting for high leverage may be more vulnerable to financial problems,

a factor which in turn may lead to an unfavorable probability of survival. In line with this perspective, Ozkan (2000) undertook an empirical analysis of the maturity of corporate debt. He found that companies taking on more substantial short-term debt could be more sensitive to interest rate fluctuations. This increased sensitivity increases their financial vulnerability and, consequently, has a negative impact on their probability of survival. Graham and Harvey (2001) focused on the confluence between theory and practice in the field of corporate finance. They highlighted the fact that companies that prefer a higher level of debt could find themselves with less adaptable cash flows in difficult economic conditions, which could alter their chances of survival. Altman (2013) revisited models for predicting corporate financial distress. He pointed out that firms adopting high leverage could exhibit unfavorable financial ratios, an aspect detrimental to their viability. It should also be noted that the link between high debt and an increased probability of business failure has been proven by Zhang et al. (2020). The correlation between a high level of debt among SMEs and an unfavorable probability of survival cannot be ignored. High levels of debt can lead to tighter financial constraints, restricting investment capacity, increasing borrowing costs and limiting the alternatives available in the event of difficulties. Together, these factors have the potential to have a negative impact on the company's long-term sustainability.

Demirgüç-Kunt and Maksimovic (1999) examined institutions, financial markets, and the maturity of corporate debt. Their work suggested that companies with strong repayment capacity may have increased financial flexibility to deal with economic turbulence. This increased financial flexibility has the potential to improve their probability of survival. However, it is commonly observed that banks are reserved about granting loans to SMEs, mostly due to their limited perception of their repayment capacity (Ślusarczyk & Grondys, 2019). This implies a vulnerability that can jeopardize SMEs' chance of survival. Acharya and Subramanian (2009) studied bankruptcy codes and their impact on innovation within firms. Their findings highlighted that firms with strong repayment capacity were better able to withstand financial disruption. This ability to cope with financial challenges can have a positive influence on their survival, while preserving their capacity to innovate. Cassar (2004) sheds further light on this issue, noting that

SMEs with a solid repayment capacity are often perceived as less risky by lenders and investors. This favorable perception increases their access to credit, a factor which in turn has a positive influence on their chances of survival. In this way, the presence of a solid repayment capacity on the part of an SME receiving credit can be a major asset for its viability. This enhanced ability to repay debts can pave the way for easier access to finance, improve the negotiation of advantageous terms, increase resilience in the face of financial disruption and contribute positively to the long-term sustainability of the business.

Van Der Vegt and Bunderson (2005) examined the dynamics of learning and performance within companies. Their analysis suggested that companies with a high level of maturity were able to make more considered and appropriate decisions, a factor which, in turn, can positively influence their probability of survival. The implications of the family for entrepreneurship were explored by Aldrich and Cliff (2003). Their investigations highlighted that companies with a solid decision-making maturity can integrate multiple perspectives into their decision-making, an aspect which, in turn, can exert a positive influence on their chances of survival. The importance of the entrepreneur's experience and managerial skills has also been highlighted in improving a company's chance of survival, as observed by Neumeyer and Liu (2021). In a similar context, Hitt et al. (2019) found that companies with strong decision-making maturity were better able to develop effective strategic plans. This strategic planning ability has the potential to positively influence their adaptability and, by extension, their survival. In this way, robust decision-making maturity within a company can have a beneficial effect on its probability of survival. This increased decision-making maturity can favor coherent strategic implementation, the ability to anticipate market fluctuations, effective integration of different perspectives and optimal exploitation of opportunities, all of which can have a positive influence on long-term viability.

Acs et al. (2017) reflected on the Global Entrepreneurship and Development Index, highlighting that firms with larger scale may enjoy more fluid access to resources and markets, a reality that could potentially exert a positive impact on their probability of survival. This notion of firm size is closely intertwined with the link between innovation capacity

and firm size and structure, a link supported by several previous studies (Petruzzelli et al., 2018; Santos & Neumeyer, 2022). In a post-Economic Recession context, it seems logical to expect small firms to do better at adapting. However, it is crucial to recognize that businesses of different sizes do not have uniform access to resources and do not share the same capabilities to pursue different strategies or operate in different markets. As a result, they face unique opportunities and threats (Masood & Sonntag, 2020). Holmes and Schaper (2018) contributed to a better understanding of the financial decisions made by small business owners. Their findings highlighted the importance of this facet in the functioning of SMEs. The analyses conducted by Löfsten (2016) clearly highlighted a positive correlation between the size of the company and its survival rate, a conclusion shared by other studies. However, it should be noted that this relationship could be non-linear, taking a decreasing trajectory, as pointed out by He and Young (2016). In summary, larger firm size – this logic extends to SMEs – can actually positively influence the probability of survival. The benefits associated with larger size, such as increased resource endowment, extended diversification, greater economic impact and greater ease of strategy implementation, can all contribute to enhancing the long-term sustainability of the firm.

Aldrich and Cliff (2003) discussed the impact of the family dimension on entrepreneurship. They argued that SMEs with a high level of managerial shareholding could demonstrate greater personal involvement, a characteristic capable of exerting a positive effect on their probability of survival. The analysis conducted by Kaplan (2012) focused on executive compensation and corporate governance. His observations highlighted the fact that companies with a high level of executive shareholding could be characterized by greater responsibility and a better alignment of interests, a fact capable of influencing firms' chances of survival. It is important to note that the survival of a firm is closely linked to its ownership structure, as well as to the stakeholders who are responsible for decisions (Ayyagari et al., 2015). Schulze et al. (2001) focused on agency relations within family businesses. Their findings highlighted the fact that SMEs with a high level of managerial shareholding were able to exercise greater control over operations, a factor that could positively increase their probability of survival. Most of the literature on the influence of family



involvement on business performance and survival takes a positive view. These works are generally convinced of the existence of a positive correlation between family involvement and parameters such as the company's performance, reputation, longevity, and capacity for innovation (Bocquet et al., 2015). In this vein, a high level of managerial involvement in the capital of a financed SME can really influence its probability of survival. This high level of participation can lead to greater commitment, a convergence of interests, close control of operations and direct and appropriate decision-making, all factors likely to have a positive influence on the long-term viability of the business.

The overriding objective of this study is to assess the viability of SMEs that have benefited from bank loans backed by government credit guarantee. The aim is to examine the impact of key factors such as the amount of credit obtained, profitability, level of indebtedness, repayment capacity, decision-making maturity, company size and managerial involvement, in order to analyze the probability of survival of SMEs in the medium and long term. Based on this literature review, the following hypotheses can be posed:

- H1: A large amount obtained in the context of credit with a government guarantee is linked to an increased probability of SME survival.*
- H2: A higher profitability of an SME at the time of applying for financing backed government guarantee is associated with an increase in its probability of survival.*
- H3: A high level of SME indebtedness when applying for financing with a government guarantee is linked to a reduced probability of survival.*
- H4: A solid repayment capacity at the time of applying for financing for an SME benefiting from credit with a government guarantee is associated with an increased probability of survival.*
- H5: The decision-making maturity of an SME at the time of applying for financing with a government credit guarantee is positively correlated with its probability of survival.*

*H6: The size of an SME at the time of applying for financing with a government credit guarantee has a positive impact on its probability of survival.*

*H7: The level of shareholding of the manager at the time of applying for financing of an SME benefiting from a loan with a government guarantee has a positive influence on its probability of survival.*

## 2. METHODS

The sample consists of 398 Moroccan SMEs that have benefited from credit covered by a government guarantee. The objective is to study the survival of these companies that have benefited from these schemes after a period of 10 years. This study uses logistic regression. The importance of the assumptions of the logistic regression can be emphasized to ensure the validity of the analysis. If these assumptions are not respected, problems such as biased coefficient estimates or significant standard errors may arise. So, before using the model for statistical inference, it is crucial to assess both the overall fit of the model and to identify any problems. Unlike linear regression, logistic regression does not rely on certain assumptions, such as the linearity of the relationship between variables, the normality of residuals or homoscedasticity. This means that logistic regression can handle more complex relationships between variables and does not require normal distribution of residuals or equal variance of errors. In addition, logistic regression can be used with categorical dependent variables, making it suitable for situations where the variable to be predicted is not measured on an interval or ratio scale. Nevertheless, certain assumptions shared with linear regression remain relevant for logistic regression. These include the appropriateness of the structure of the dependent variable, such as the need for a binary variable for binary logistic regression or an ordinal variable for ordinal logistic regression.

In addition, the independence of the observations is essential, meaning that each observation must be independent of the others, with no particular links or correlations. Multicollinearity, which refers to high correlation between independent variables, can also affect logistic regression. It is pref-

erable to avoid such excessive correlation in order to obtain stable coefficient estimates. Finally, the absence of specification error is important. This means that the model assumes that the logit of the dependent variable is a linear combination of the independent variables. If the link function (such as the logit) is not correctly chosen or if the relationship between the logit of the dependent variable and the independent variables is not linear, specification errors may occur. In this case, alternatives for the link function need to be considered. Logistic regression offers flexibility compared to linear regression by handling categorical dependent variables and by not relying on certain key assumptions. However, conditions specific to logistic regression, as well as assumptions shared with linear regression must be respected to guarantee reliable and interpretable results. The model specification for this study is given below:

ing into account the total assets it owns. *PCMS* corresponds to the percentage of the manager's stake in the SME's capital. Table 1 summarizes the hypotheses and the variables they represent.

**Table 1.** Research hypotheses and variables

| Variables | Hypotheses | Correlation direction |
|-----------|------------|-----------------------|
| AMCRT     | H1         | Positive              |
| PROF      | H2         | Positive              |
| INDPT     | H3         | Negative              |
| REPCP     | H4         | Positive              |
| DMM       | H5         | Positive              |
| SIZE      | H6         | Positive              |
| PCMS      | H7         | Positive              |

$$\begin{aligned}
 SURV_i(Y) = & \alpha_i + \overbrace{\beta_1 \cdot AMCRT_i + \beta_2 \cdot PROF_i + \beta_3 \cdot INDPT_i + \beta_4 \cdot REPCP_i}^{\text{characteristics of the financing application}} \\
 & + \overbrace{\delta_1 \cdot DMM_i + \delta_2 \cdot SIZE_i + \delta_3 \cdot PCMS_i}^{\text{control variables}} + \varepsilon_i,
 \end{aligned} \tag{1}$$

where  $SURV(Y)$  is a binary variable that indicates whether or not the SME will survive ten years after the loan application. It takes the value 1 if the SME survives, and 0 if it does not. *AMCRT* indicates the amount of credit obtained at the time of the financing application, expressed in local currency (DH). *PROF* measures the profitability of the SME at the time of the financing request. This measure is based on the Net Profit Margin, calculated by dividing Net Profit by Total Revenue, expressed as a percentage. *INDPT* reflects the SME's overall level of indebtedness at the time of seeking finance. It is assessed in terms of net debt. *REPCP* refers to the SME's repayment capacity at the time of applying for finance, measured by the Interest Coverage Ratio. This ratio is calculated by dividing earnings before interest and tax by interest paid. A high coverage ratio, generally around 4 or 5, indicates solid repayment capacity. *DMM* represents the SME's decision-making maturity at the time of applying for finance. This maturity is calculated by taking the average of the respective ages of the company director and the company itself. *SIZE* evaluates the size of the SME at the time of the loan application, tak-

### 3. RESULTS

Table 2 presents the results of the logistic regression, highlighting the comparison between the full model and the reduced model. This comparison is based on the difference in -Log-likelihood values, representing the respective fit of the models to the data.

The initial focus is on the difference in -Log-likelihood between the full model and the reduced model, symbolized by the term "Difference". With a significant value of 144.192, this difference is very large. This indicates that the introduction of the independent variables into the full model leads to a significant improvement in the fit compared with the reduced model, which is limited to the constant. This difference suggests that the independent variables added to the full model have a significant impact on the prediction of the dependent variables. Examination of the -Log-likelihood values confirms that the full model has a better fit to the data. The full model has a lower -Log-likelihood value (128.005)

**Table 2.** Logistic regression goodness of fit

| Model                           | -Log-likelihood | Degrees of freedom | Chi-square | Prob. > chi-square |
|---------------------------------|-----------------|--------------------|------------|--------------------|
| Difference                      | 144.19235       | 7                  | 288,3847   | < .0001*           |
| Full                            | 128.00559       | —                  | —          | —                  |
| Reduced                         | 272.19794       | —                  | —          | —                  |
| R square (U)                    |                 |                    |            | 0.5297             |
| AICc                            |                 |                    |            | 272.381            |
| BIC                             |                 |                    |            | 303.903            |
| Observations (or weighted sums) |                 |                    |            | 398                |

than the reduced model (272.197), indicating a better fit of the full model to the observations. The coefficient of determination index, R-squared (U), reflects the ability of the full model to explain the variability observed in the data. With a value of 0.5297, the full model can explain around 53% of the variation in the data, suggesting a highly significant prediction of the dependent variable by the independent variables included in the model. The use of information indicators such as the AICc and the BIC makes it possible to compare the relative quality of the models. The AICc (272.381) and BIC (303.903) values for the full model indicate a relative fit of the model to the data. The robustness of the results is enhanced by the fact that they are based on a set of 398 observations. This robust sample size adds to the credibility of the conclusions drawn. In sum, this analysis convincingly demonstrates the superiority of the full model over the reduced model.

The confusion matrix is a method commonly used to assess the quality of predictions of models, offers rich insights into the relevance of predictions to actual observations. By analyzing the confusion matrix provided in depth, the performance of the model can be disentangled and informed conclusions drawn in the context of SME survival after obtaining bank finance. The confusion matrix, in Table 3, presents two distinct classes: ‘SURV’ (representing the survival of an SME) and ‘1’ (representing the positive class) on the one hand, and ‘0’ (representing the negative class) on the other. Each element of the matrix details the number of observations predicted for a given class as a function of actual observations. ‘Observation’ reveals the model’s predictions in relation to actual observations. For example, the model correctly predicted the survival of 147 SMEs (class ‘1’) and predicted the non-survival of 199 SMEs (class ‘0’). However, it also produced 25 erroneous predictions for class ‘1’ and 27 erroneous predictions for class ‘0’.

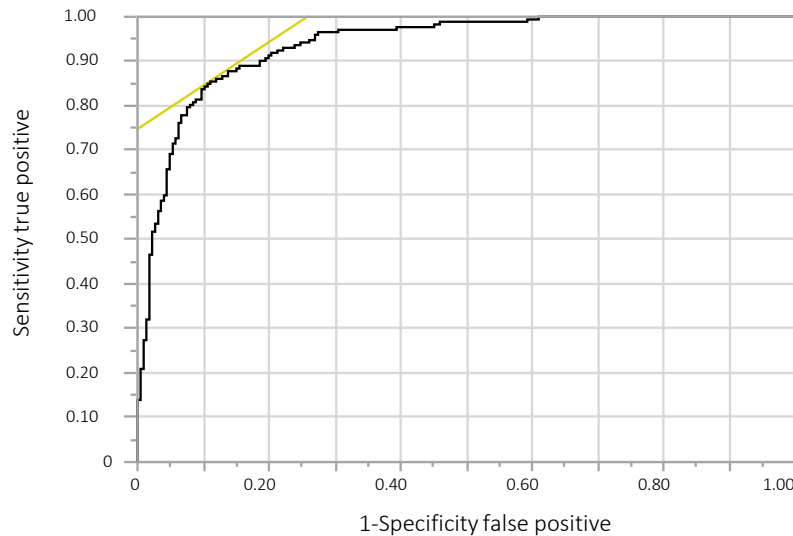
**Table 3.** Confusion matrix

| Absolute frequencies |                 |       |
|----------------------|-----------------|-------|
| Observation          | Expected number |       |
| SURV                 | 1               | 0     |
| 1                    | 147             | 25    |
| 0                    | 27              | 199   |
| Relative frequencies |                 |       |
| Observation          | Forecast        |       |
| SURV                 | 1               | 0     |
| 1                    | 0,855           | 0,145 |
| 0                    | 0,119           | 0,881 |

In the ‘Prediction’ section, the values express the prediction rates for each class. The model predicted surviving SMEs (class ‘1’) with a rate of around 85.5% of SMEs actually surviving. For class ‘0’, the model predicted non-surviving SMEs at a rate of around 88.1%. The sensitivity, which measures the model’s ability to correctly identify surviving SMEs, was around 0.855, or 85.5%. This means that the model successfully captured almost 85.5% of the SMEs that actually survived. The specificity, represented by the rate of true negatives, is around 0.881, indicating that the model correctly predicted around 88.1% of the SMEs that were actually non-survivors. The false positive and false negative rates highlight the model’s classification errors. The false positive rate (0.119) suggests that the model incorrectly predicted around 11.9% of non-surviving SMEs as actually surviving SMEs. Similarly, the false-negative rate (0.145) means that the model incorrectly classified around 14.5% of actually surviving SMEs as non-surviving.

The ROC curve (Receiver Operating Characteristic) and the AUC (Area Under the Curve) in Figure 1 are essential tools for assessing the performance of classification models, particularly in the context of logistic regression. These metrics are used to analyze the model’s ability to discriminate between positive and negative classes.





Note: Use SURV = '1' to be the positive level. Area under the curve (AUC) = 0.93733.

**Figure 1.** ROC curve

ROC curve is a chart that shows the relation that exists between the true-positive rate (sensitivity) and the false-positive rate (1 – specificity) for different classification levels. In other words, it shows how sensitivity and specificity evolve as the model adjusts its decision threshold. A well-fitted ROC curve tends to rise rapidly towards the top left-hand corner, indicating a better ability to discriminate between classes. The AUC represents the surface area under the ROC curve. The closer the AUC is to 1, the more accurately does the model distinguish positive and negative classes. A value of 0.937 indicates that the ROC curve is relatively close to the upper left-hand corner, suggesting that the model has an excellent ability to discriminate.

The analysis of multicollinearity is an essential step in the construction of logistic regression models. The VIF (Variance Inflation Factor) is an index commonly used to assess the presence of multicollinearity between the independent variables of a regression model. The VIF measures the increase in the estimated variance of a regression coefficient due to the correlation between this variable and the other independent variables. A VIF value close to 1 suggests no or very low correlation between the variable and the other independent variables, which is desirable. VIF values above 1, but generally below 10, indicate moderate correlation between the variable and the other independent variables.

**Table 4.** Variance Inflation Factor (VIF)

| Terms | VIFs      |
|-------|-----------|
| AMCRT | 1.005629  |
| PROF  | 1.0081907 |
| INDPT | 1.0078448 |
| REPCP | 1.0037635 |
| SIZE  | 1.0062344 |
| PCMS  | 1.0112843 |
| DMM   | 1.007121  |

In the results provided in Table 4, all the VIF values are close to 1, indicating an absence or very low correlation between the independent variables. This suggests that multicollinearity between these variables is minimal, which is positive for the stability and interpretation of the logistic regression model. In particular, the VIF values indicate that there is no major concern in terms of multicollinearity. This means that the coefficients estimated in this logistic regression model are stable and interpretable.

Table 5 provides coefficient estimates, standard errors, the results of the likelihood ratio test (Chi-square) and p-values for each variable in the logistic regression model. The *AMCRT* variable is statistically significant at the 1% level. This variable can be considered to have a significant effect on the probability of SME survival, which leads to the acceptance of hypothesis *H1*. With regard to the *PROF* variable, the coefficient is negative, and its associated p-value is < 0.0001. Given that the p-

**Table 5.** Logistic regression coefficient estimates

| Terms    | Estimate   | Standard error | Chi-square | Prob. > chi-square |
|----------|------------|----------------|------------|--------------------|
| Constant | -9.1121286 | 1.2002964      | 57.63      | < .0001***         |
| AMCRT    | 2.46656e-9 | 9.046e-10      | 7.44       | 0.0064***          |
| PROF     | 0.08939543 | 0.0162194      | 30.38      | < .0001***         |
| INDPT    | -1.4801e-7 | 1.5514e-7      | 0.91       | 0.3400             |
| REPCP    | 0.0524948  | 0.0908769      | 0.33       | 0.5635             |
| DMM      | 0.26118223 | 0.0270405      | 93.30      | < .0001***         |
| SIZE     | -8.4838e-8 | 2.4931e-8      | 11.58      | 0.0007***          |
| PCMS     | 1.0677197  | 0.6152671      | 3.01       | 0.0827*            |

Note: \*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

value is very low, the *PROF* variable is statistically significant at the 1% level and has a significant effect on the probability of SME survival. Thus, hypothesis *H2* is accepted. On the other hand, the *INDPT* variable has an associated p-value of 0.3400, above the 0.05 threshold. Consequently, the *INDPT* variable is not statistically significant, which suggests that hypothesis *H3* could be rejected. Examination of the *REPCP* variable reveals that although its coefficient is consistent with hypothesis *H4*, its associated p-value is high (0.5635). This high p-value indicates that the *REPCP* variable is not statistically significant, and therefore hypothesis *H4* cannot be accepted.

The *DMM* variable, which has a positive coefficient and an associated p-value < 0.0001, is statistically significant at the 1% level. This variable has a significant effect on the probability of survival, which leads to accept hypothesis *H5*. Concerning the *SIZE* variable, its negative coefficient and the associated p-value of 0.0007 make it statistically significant at the 1% level. However, the negative sign of the coefficient runs counter to hypothesis *H6*, which implies that hypothesis *H6* must be rejected. With regard to the *PCMS* variable, its coefficient is positive, with an associated p-value of 0.0827, below the 0.1 threshold. Consequently, the *PCMS* variable is statistically significant at the 10% threshold, which suggests that hypothesis *H7* can be accepted.

## 4. DISCUSSION

The results obtained in this study are in line with the findings of several researchers in the field. Khwaja and Mian (2008), Gropp et al. (2014), and Bakhtiari et al. (2020) all converge on the same

idea that government credit guarantees play a crucial role in firm survival. They point out that larger amounts of credit promote the financial resilience and growth of firms, thereby strengthening their probability of survival. The results of this study support this perspective by showing that larger amount of credit lead to greater investment and a higher probability of survival. Furthermore, the findings of Peprah (2016) are echoed in this study, where a positive relationship between profitability and the probability of survival of SMEs is highlighted. More profitable businesses attract more investors and lenders, improving their access to credit and increasing their chances of survival. It is therefore suggested that government guarantees should focus more on profitable SMEs to maximize their effectiveness.

However, there are discrepancies with other studies. Contrary to the conclusions of Zhang et al. (2020), this study does not find a significant link between high levels of debt and a reduction in the probability of survival of SMEs. Similarly, the non-significance of the relationship between repayment capacity and survival probability runs counter to the findings of Hitt et al. (2019) and Acharya and Subramanian (2009), who highlighted the positive role of repayment capacity in the financial resilience and survival of firms. These results indicate that government guarantees may not rely solely on financial indicators to assess the viability of beneficiary companies. The positive correlation between decision-making maturity and the probability of survival corroborates previous observations by Schulze et al. (2001) and Van Der Vegt and Bunderson (2005). These studies highlighted the fact that well-informed and well-thought-out decisions contribute to the long-term viability of companies. Thus, it is suggested that government

guarantees should favor SMEs run by experienced and competent individuals.

Furthermore, contrary to the findings of Löfsten (2016), a negative correlation was found between firm size and survival probability. The results suggest that smaller SMEs have high survival chances due to their resilience and adaptability. It is therefore proposed that institutional guarantees may be advantageous for small SMEs. Also, the positive relationship between managerial ownership and the probability of survival is consistent with the find-

ings of Aldrich and Cliff (2003) and Kaplan (2012). This study highlighted the importance of the personal involvement of managers and strong governance for the survival of companies. With this in mind, it is suggested that government guarantees should target SMEs with strong management commitment. In summary, credit guarantee schemes should take into account factors such as profitability, decision-making maturity, company size and management involvement to maximize their impact on the probability of survival of SMEs benefiting from loans backed by credit guarantee schemes.

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## CONCLUSION

The study employed an empirical methodological approach to assess the viability of SMEs that had benefited from bank loans backed by credit guarantee schemes. The sample comprised 398 Moroccan SMEs that had benefited from this type of financing, and the primary objective was to examine their survival over the ten years following the obtaining of these guarantees. The variables analyzed included various characteristics inherent in the application for finance, as well as control parameters. The methodological framework employed was based on a logistic regression approach designed to examine the dynamics linking these variables to the probability of SME survival. Various independent variables were formulated for hypotheses, including the links between the amounts of credit obtained, profitability, indebtedness, repayment capacity, the maturity of decisions, the size of the company, and the involvement of the manager, all orchestrated in an approach to evaluate the probability of survival of these SMEs.

The findings suggest that government credit guarantees play a crucial role in business survival. Larger amounts of credit are associated with better financial resilience and increased growth of SMEs, thereby increasing their likelihood of survival. This highlights the importance of financial support mechanisms for SMEs and their impact on long-term viability. Business profitability appears to be a key factor in the probability of survival. Profitable businesses are more likely to attract investors and lenders, which improves their access to credit and increases their chances of survival. This raises the question of directing credit guarantee schemes towards SMEs with strong financial performance. Contrary to certain studies, this study does not find a significant link between high levels of debt and a reduction in the probability of SME survival. Furthermore, the absence of a significant relationship between repayment capacity and the probability of survival suggests that other non-financial factors could have a greater impact on business survival.

The decision-making maturity of managers appears to have a positive influence on the probability of business survival. Well-informed and well-thought-out decisions contribute to long-term viability. This underlines the importance of competent and experienced management in the SME context. Contrary to certain beliefs, this study finds a negative correlation between company size and the probability of survival. Smaller SMEs have higher chances of survival because of their agility and adaptability. As a result, credit guarantee schemes need to be targeted more at smaller SMEs. The active participation of the manager in the company's capital is positively linked to its probability of survival. This underlines the importance of the personal commitment of managers and strong governance to ensure the sustainability of the company. In summary, the results of this study provide insights into the factors that influence the probability of survival of SMEs benefiting from government -guaranteed bank loans. These findings emphasize how profitability, maturity of decision making, firm size, and management involvement are crucial in enhancing credit guarantee schemes in the objective to maximize the survival rate of those SMEs.

## AUTHOR CONTRIBUTIONS

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