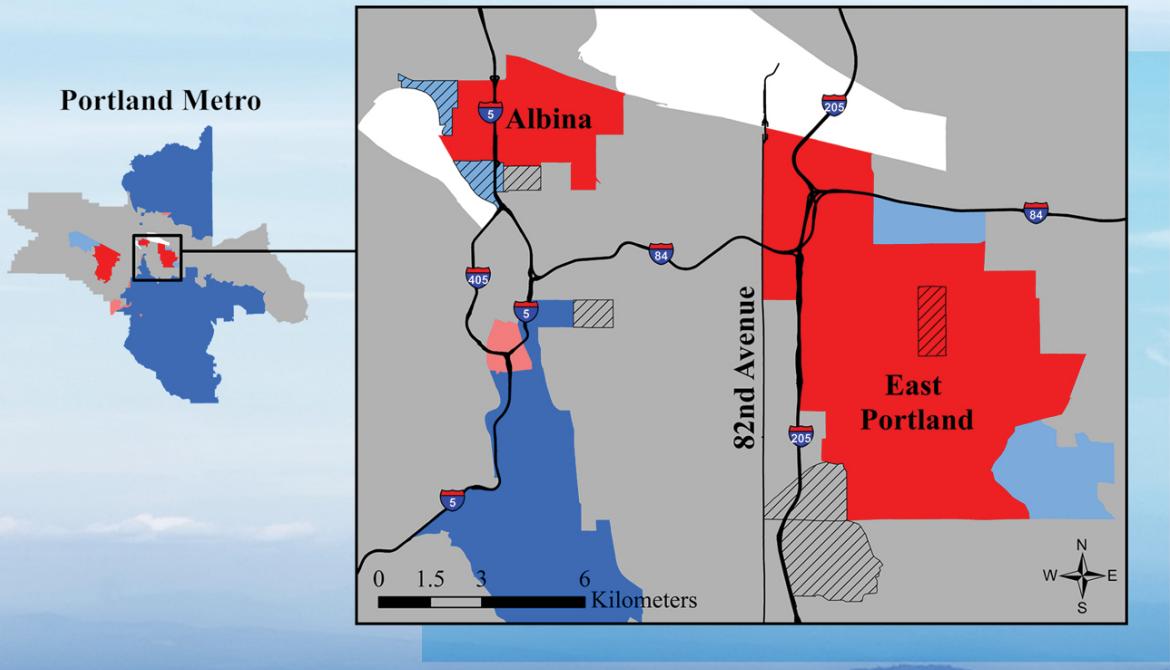




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Article

# Capital Structure across Italian Regions: The Role of Financial and Economic Differences

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**Abstract:** The objective of this article is to analyse how regional financial and economic differences influence the capital structure decisions of small and medium-sized enterprises (SMEs). Specifically, this paper considers the regional financial and economic differences in four ways: the development of the financial sector in the region, bank market concentration, the financial cost of obtaining funds, and regional economic development. For this purpose, we used unbalanced panel data from 26,504 SMEs across the 20 Italian regions and over the period from 2004 to 2010. This work is completed with an analysis of a no-crisis (2004–2007) and a crisis period (2008–2010). The results show that the regional differences in the degree of financial sector development, banking concentration, and local economic situations have a significant impact on the leverage level of SMEs, while the cost of obtaining funds is only relevant during a period of economic stability. These results suggest that insights can be derived from data disaggregation at the regional level inside the same country. These regional divergences in the capital structure of SMEs could influence regional economic resilience.

**Keywords:** capital structure; SMEs; regional financial sector; financial development; banking concentration; costs of funding; financial crisis; panel data; regional economic resilience

## 1. Introduction

There is a broad and thorough body of literature that has investigated capital structure decisions since the work of Modigliani–Miller [1]. Within this context, there is an extensive line of research that analyses the institutional framework in which businesses operate. It is important to highlight that the institutional environment is defined, among other aspects, by the degree of the development of financial systems and the level of efficiency of legal systems. In this way, La Porta et al. [2] and Rajan and Zingales [3] are the first to show the importance of institutional context in explaining firm leverage.

The studies that analyse the impact of institutional factors by carrying out cross-country samples of small and medium-sized enterprises (SMEs) have been conducted by Giannetti [4], Utrero-González [5], and Hernández-Cánovas and Koëter-Kant [6]. Giannetti [4] shows that favoured creditor rights ensure stricter enforcement, associated not only with higher leverage but also with a greater availability of long-term debt. Utrero-González [5] finds, for a sample of European countries, that prudent banking regulation is positively connected with industry indebtedness, indicating that prudent rules make it easier for firms to access credit markets. Finally, Hernández-Cánovas and Koëter-Kant [6] find that SMEs in countries that protect their creditors and enforce existing laws are more likely to obtain long-term bank debt.

There are a few studies that focus their research on a regionalised approach. These studies highlight differences in the level of debt across regions due to discrepancies between the regional institutional systems. These differences should be considered mainly in terms of the financial system and the level of economic development [7–9].

The aim of this paper is to analyse how regional differences in the financial and economic context influence the capital structure decisions of SMEs. Our hypothesis is that the connection between SMEs and the local system in which they operate is particularly intense, despite the high degree of openness towards foreign countries that usually exists today. Though most of the studies in the literature have not yet incorporated a regionalised approach into their analyses, we believe that this approach allows for a better identification of the relationship between the institutional factors and the capital structure of SMEs. This regional study contributes to this growing area of regional research and explores several aspects that could influence regional resilience.

To accomplish the purpose of the paper, we use unbalanced panel data from 26,504 SMEs across the 20 Italian regions and over the period from 2004 to 2010. It is essential to discover why the capital structure of SMEs varies from region to region and identify which factors influence the financial choices of these companies. This research is especially relevant in all countries that have regional differences, since the policymakers might seek to eliminate the asymmetries between regions and strengthen regional resilience.

We utilise the Italian case for a variety of reasons. First, according to Charron et al. [10], Italy is the country with broad institutional differences across regions and a huge regional discrepancy in its level of economic activity. As outlined by Sarno [11], the companies located in the south of Italy use more internal resources to finance growth than firms in the northern Italian regions due to the more-strongly binding financial constraints in the south of Italy. This result is reinforced by La Rocca et al. [7], who highlight that a significant difference exists in the capital structure of SMEs between the north and south macro areas of Italy and that this difference is explained by institutional factors.

This article contributes to the literature in different forms. Notably, this work complements previous research (such as La Rocca et al. [7] and Palacín-Sánchez, di Pietro [9]) by considering together four factors to appreciate regional financial and economic differences: the development of the financial sector in the region, bank market concentration, the financial cost of obtaining funds, and regional economic development. One of the principal contributions of this paper is the introduction of the variable of the financial cost of obtaining funds, which, as far as we know, is used here for the first time as an explanatory variable in a regional capital structure study. In our opinion, this variable is especially important in cases such as Italy that present large differences across regions. Because the recent financial crisis has had an impact on capital structure decisions, the crisis effect on the explanatory variables is studied. Thus, the factors are analysed during both the no-crisis period (2004–2007) and the crisis period. This research allows us to focus more on regional economic resilience in the recent crisis [12], since the common view is that SMEs suffered from strong credit restriction during the crisis. This is consistent with the observations from the Bank Lending Survey of the Central European Bank stating that banks have, during the crisis, adopted a more severe policy for their loans to SMEs [13]. The remainder of the paper is organised as follows: Section 2 presents the literature and our testable hypotheses. Section 3 illustrates the dataset, the variables, and the descriptive statistics. Section 4 presents the econometric model. Section 5 discusses the results and concludes the study.

## 2. Literature Review and Testable Hypotheses

We present a review of the financial and economic institutional factor literature and its relationship to the capital structure of firms. We focus on four main aspects: the development of the financial sector in the region, bank market concentration, the financial cost of obtaining funds, and regional economic development.

## 2.1. Development of the Financial Sector

In recent years, many studies have considered the financial sector as one of the institutional factors that can affect financial decisions. According to Beck et al. [14], financial sector development and economic development are the most important institutional factors to explain cross-country variations in financing obstacles. Through a survey of responses from over 4000 firms in 54 countries, they found that, on average, firms located in countries with a more developed financial system have fewer obstacles in obtaining external funds. Like Beck et al. [14], Nivorozhkin [15] finds a positive relation between leverage and the proxy used for financial development. This relation was one of the arguments that Cornelli et al. [16] advanced to explain the lower leverage of eastern companies compared to western companies in Europe. According to these authors, the eastern countries use less debt due to the lack of financial supply caused by the underdeveloped financial system.

A majority of the previous studies that take into account the development of the financial sector usually carry out international comparisons [4,5,17–21]. However, recent studies such as La Rocca et al. [7] and Palacín-Sánchez and di Pietro [9]. use the development of the financial sector to explain regional differences inside one country since, theoretically, the same relation should exist in less developed regions within a country characterised by large regional differences. Both studies highlight the positive role of a developed financial sector on the use of debt, especially long-term debt.

In the specific case of Italy, the banking system is organised with national banks that have branches throughout the country and with small independent local banks that operate in a restricted area. Historically, Italy has been characterised by restrictive regulations in the geographical mobility of their banks and, coupled with the peculiarities of their industrial structure based largely on a network of small and medium-sized enterprises, local banks have been a primary agent in the development of local economies.

Considering previous studies, our primary hypothesis is as follows:

**H1.** *A developed financial sector has a positive effect on SME leverage.*

## 2.2. Banking Market Concentration

The effect of the banking market's concentration on capital structure has been widely studied. Considerable research suggests that a concentrated banking sector should facilitate credit access. In this regard, Petersen and Rajan [22] affirm that more concentrated banking makes it easier for lenders to internalise the benefits of dealing with financially constrained firms. Corvoisier and Groppe [23] show that a concentrated bank market is the result of efficient banks better exploiting growth opportunities. However, they also find that, in this case, banks apply higher interest margins for loans and, consequently, offer more-expensive financing.

Alternatively, there is a group of studies that conclude that a greater banking market concentration may be linked to less credit availability. Beck et al. [14] determine that this linkage may create difficulties for SMEs to obtain financing. Boot and Thakor [24] find that a more competitive bank system encourages lenders to build up stronger relations with clients to mitigate asymmetry information problems.

Studies from a regional perspective evidence that differences between regional financial sectors can help explain divergences in their capital structures, particularly concerning SMEs. Palacín-Sánchez and di Pietro [9] show that a more concentrated regional banking sector has a negative influence on a firm's leverage, based on a sample of Spanish SMEs, and Coccores [25] concludes that a bank's market power is quite different across different regions in Italy due to the structure of the local banking markets. There are few branches and, in general, less competition between banks that exist in more-concentrated markets.

According to previous studies, the relation between banking market concentration and SME leverage is unclear. Thus, we divide the second of our hypotheses in two:

**H2a.** *A concentrated banking market has a negative impact on SME leverage.*

**H2b.** *A concentrated banking market has a positive impact on SME leverage.*

### 2.3. Cost of Debt

The cost of debt directly affects capital structure. This effect depends on three components: the general level of the interest rate, the default risk premium, and the firm's tax rate. In this sense, Leland [26] and Goldstein et al. [27] demonstrate that a firm's optimal capital structure is extremely sensitive to changes in interest rates. More recently, Deesomsak et al. [28] show that changes in interest rates can affect capital structure, since firms are more likely to use debt when the cost of borrowing is low. Bas et al. [29] and Bartholdy and Mateus [30] conclude that when the interest rate increases, firms are less willing to use leverage to finance new investments because of the increase in the cost of borrowing. Nevertheless, according to Deesomsak et al. [28], interest rates also incorporate inflation expectations. Thus, firms could be expected to shift from equity to debt financing when interest rates are increasing. In this case, the level of interest rates is expected to be positively related to leverage. There is an extensive line of more specific research that studies the effect of the stochastic interest rate on capital structure ([31,32]).

The cost of debt is especially relevant in Italy since the interest rates applied by the bank sector vary significantly according to the region. In general, Italy is divided into two areas, the Centre-North and the Centre-South. In the Centre-North, the interest rate applied is on average lower than is the interest rate applied in the Centre-South. The difference in interest rates is explained, at least in part, by a different credit risk, which is higher in the south. According to the Bank of Italy [33], the irrecoverable debts on bank loans ratio in all south regions is higher than the corresponding national average.

Taking into account that Italy does not experience high inflation in the periods of study, we formulate our third hypothesis as follows:

**H3.** *The cost of debt has a negative impact on SME leverage.*

### 2.4. Development of Economy

The relation between the development of the economy and the capital structure has been widely analysed ([17–19,28], among others). There is a group of works that analyse, within a single country, differences in the capital structures between regional economies [7,9,22].

In Italy, where national economic growth slowed significantly in the 2004–2010 period, regional economic growth was significantly different among regions.

According to the research referred to above, economic growth could influence the investment opportunities for SMEs and, therefore, SMEs could need new funds to take advantage of these opportunities. Hence, our fourth hypothesis is as follows:

**H4.** *Regional economic growth has a positive effect on SME leverage.*

## 3. Data and Empirical Methodology

### 3.1. Data

Firm data are obtained from the Company Accounts Data Service (CADS) database, which includes information on more than 135,000 Italian businesses operating in all industry sectors and has been available since 1982 (CADS is provided by Centrale dei Bilanci—a company set up jointly by the Bank of Italy, the ABI—Italian Banking Association—and other leading Italian banks. The company collects highly disaggregated balance sheets, income statements and cash-flow statements, and detailed information on the characteristics of Italian companies. CADS is highly representative of the population of Italian firms, covering over 50% of the value added by those companies included in the Italian Central Statistical Office's Census). The firms selected conform to the European Commission's definition of SMEs (European Union Recommendation, 2003/361/CE) for every year under consideration in the 2004–2010 period (several employees in the [10, 250] range and total sales in the [2, 50] million euros

range). The final dataset is an unbalanced panel of 26,504 firms for a total number of observations equal to 159,026.

### 3.2. Variables

In our empirical analysis, the dependent variable is leverage, while the independent variables are divided between regional variables and firm variables. The definitions of these variables are presented below.

#### 3.2.1. Dependent Variable

The dependent variable, leverage, is calculated as the ratio of total financial debt to total debt plus equity (TDR) (trade credit is excluded). This variable has been widely used in previous studies, such as Van der Wijst and Thurik [34], Michaelas et al. [35], Giannetti [4], Sogorb-Mira [36], Utrero-González [5], La Rocca et al. [7], Degryse et al. [37], and Palacín-Sánchez and di Pietro [9].

#### 3.2.2. Regional Variables

Our paper uses four regional variables (bank branches, banking market concentration, cost of debt, and real economy), of which three are financial variables. The first variable is related to the development of the financial sector and measures the degree of development of the Italian regional banking sector by using as a proxy the number of regional bank branches per 10,000 inhabitants (Nº Branches). This indicator has been taken from the Bank of Italy. Following Petersen and Rajan [38], La Rocca et al. [7], and Palacín-Sánchez and di Pietro [9], the number of branches is linked to the degree of the relationship between banks and SMEs. Therefore, the greater the number of branches, the better the relationship and the less asymmetric the banking system information. Consequently, it is easier for SMEs to be financed. Therefore, we anticipate a positive relationship with leverage.

The second financial variable is a proxy of the regional banking market concentration (Lerner). The index was established by Coccorese and Pellechia [39] and is equivalent to a Lerner index on a regional basis. This index is an appropriate indicator of market competition [9,40]. Carbó et al. [40] highlight that the Lerner index is a superior measure of market power. This index varies between 0 and 1, with a zero value meaning high competition in the banking sector, while a value equal to 1 signifies the existence of market power. As stated above, due to the reduced negotiation power and lower geographical mobility capacity of SMEs, especially in Italy, we expect a negative association between the two variables.

The third financial variable is related to the regional cost of debt. This variable is measured as the interest rate spread paid on cash loans, taking as a benchmark the average interest rate paid in the Centre-North part of the country (Int\_diff). The data source is the Bank of Italy. As we have previously mentioned, we expect a negative relation with leverage.

Finally, the fourth regional variable is related to the real economy. We use the average annual growth rate in GDP per capita by region (gdpg\_regio). Regional GDP growth is commonly used as a control variable for the economic situation. This variable comes from the Italian Statistics Office (ISTAT).

#### 3.2.3. Firm-Level Variables

Our paper uses six firm-level variables as proxies for size, asset structure, profitability, growth, risk, and age. All of these variables have been used in previous capital structure studies.

The Size of firm (SIZE) is measured as the logarithm of total assets [7,37]. The Asset structure (AS) is net fixed assets divided by the total assets of the firm [3,4,7,18,19]. The Profitability (PROF) is defined as the ratio between the earnings before interest, taxes, amortization, and the depreciation and total assets [3,7,19,36]. Growth (GROWTH) is measured as growth of the assets, calculated as the annual percentage change of the total assets of the firm [37]. Business risk (RISK) is defined as the within standard deviation of earnings before interest and taxes for each firm divided by its book

value of total assets ([18,19,41]). Finally, the age of the firm (AGE) is measured as the logarithm of the number of years that the firm has been operating [7]. According to previous studies on capital structure in SMEs (e.g., [9]), the leverage of firms has a positive relationship with firm size, asset structure, and growth, and a negative relationship with profitability, business risk, and age. Moreover, to control for variation across business sectors, sectoral dummies are also added. Table 1 summarises the explanatory variables considered in the current study and their expected signs.

**Table 1.** Explanatory variable signs.

Classification	Explanatory Variable	Notation	Hypotheses and Expected Signs	Data Source
Regional variables				
Financial variable	Bank branches	No.Branches	H1 (+)	Bank of Italy [33]
Financial variable	Lerner index	Lerner	H2a (-) H2b (+)	Coccorese and Pellechia [39]
Financial variables	Regional cost of debt	Int_diff	H3 (-)	Bank of Italy [33]
Economy variable	Real economy	gdpg_regio	H4 (+)	Italian Statistics Office (ISTAT)
Firm-level variables	Size of firm	SIZE	+	CADS
	Asset structure	AS	+	CADS
	Profitability	PROF	-	CADS
	Growth	GROWTH	+	CADS
	Business risk	RISK	-	CADS
	Age of firm	AGE	-	CADS
Control variable	Sectoral dummy			

### 3.3. Descriptive Statistics

Table 2 presents the average ratio of the total debt for each of the 20 regions of Italy and the average regional variables across regions. All variables are estimated by region as the temporal average over the period from 2004 to 2010. The average total debt ratio of Italy is 30.2% for the total sample of Italian SMEs. On the other hand, by comparing, region by region, the level of debt for firms in the sample, geographical differences can first be assessed. Campania has the lowest total debt ratio (26%), whereas Umbria has the highest (32%). Moreover, these differences are also statistically significant according to the analysis of variance (ANOVA) carried out (Bartlett's test for equal variances:  $\chi^2(19) = 302.3125$ ;  $\text{Prob} > \chi^2 = 0.000$ ). A Wilks' lambda test of means for each variable is also displayed, and the null hypothesis of no difference is rejected with a probability of 0%. In other words, all variables are statistically different from the mean at the region basis. Overall, SMEs in southern Italy use fewer external funds than do SMEs in northern Italy. This result is consistent with Coccorese [25]. It is also worth mentioning the marked difference across regions for all the indicators. The number of bank branches varies from the 2.63 for Calabria to 9.13 for Trentino Alto Adige. As far as the Lerner index is concerned, the regions in the south of Italy present the highest values, denoting a more concentrated banking market. Basilicata presents the greatest value (0.27), compared to Lombardy, which has the lowest (0.13). With respect to the interest rate spread, SMEs located in Calabria pay an interest rate 1.34% higher than the Centre-North average. On the other hand, in Trentino Alto Adige, SMEs pay an interest rate 0.35 lower than the Centre-North average. With regard to the real economy (gdpg\_regio), Lazio and Veneto are the regions with the highest growth, while Campania has the lowest growth. Overall, differences are noted between financial and economic factors across regions. It remains to be ascertained whether these regional differences impose any statistically significant effect on the financing decisions of SMEs.

**Table 2.** Average regional variables across regions. TDR, total debt plus equity.

Region	TDR	No.Branches	Lerner	Int_diff%	gdpg_regio
Abruzzo	0.302	5.114	0.217	0.6000	0.00191
Basilicata	0.281	4.200	0.274	0.8048	-0.0030
Calabria	0.267	2.634	0.269	1.341	-0.0035
Campania	0.267	2.788	0.216	0.952	-0.0044
Emilia Romagna	0.266	8.086	0.149	-0.162	0.007
Friuli VG	0.294	7.688	0.152	-0.059	0.004
Lazio	0.312	4.884	0.149	0.252	0.008
Liguria	0.287	6.188	0.189	0.164	0.004
Lombardia	0.269	6.635	0.132	-0.055	0.000
Marche	0.298	7.558	0.158	0.0741	0.003
Molise	0.288	4.460	0.271	1.0411	-0.001
Piemonte	0.309	6.026	0.150	0.209	-0.001
Puglia	0.271	3.435	0.213	0.756	-0.002
Sardegna	0.287	4.095	0.219	0.577	0.001
Sicilia	0.267	3.495	0.217	0.770	0.000
Tuscany	0.276	6.605	0.158	0.181	0.004
TrentinoAA	0.312	9.136	0.170	-0.356	0.007
Umbria	0.317	6.338	0.203	0.2637	-0.000
ValleDAosta	0.324	7.773	0.249	0.2535	0.008
Veneto	0.282	7.264	0.168	-0.0316	0.009
Wilks' lambda test of means (F statistic)	193.39	$2.5 \times 10^5$	9274.50	24024	149.86
Italy	0.302	6.398	0.1963	0.1209	0.003

Figure 1 shows a map of Italy in which the regions whose average ratio of total debt is under the national average (in red). This map highlights the marked difference in the use of debt between the north and the south of Italy.

**Figure 1.** Total debt ratio under and above the national average.

Finally, Table 3 displays the correlations between all study variables. Despite the statistical significance due to the high number of observations, the absolute values of correlation coefficients are quite low—well below the benchmark of 30%. The only exceptions are the correlations between No.Branches, Lerner, and Int\_diff. These regional financial variables are those that do not have firm-level variability. The variance inflation factor (VIF), which is estimated to test possible problems of collinearity, presents 7.41 as the highest value, a result that is below the limit denoting multicollinearity problems (10).

**Table 3.** Correlation Matrix.

Variables	TDR	SIZE	AS	Profit	Risk	Growth	AGE	No.Branches	lerner	Int_dif	gdpg_regio
TDR	1										
SIZE	0.1332***	1									
AS	0.1091***	0.1159***	1								
Profit	-0.1659***	-0.0190***	0.0196***	1							
Risk	-0.0316***	-0.0486***	-0.0087***	-0.0288***	1						
Growth	-0.0093**	0.1056***	-0.0251***	0.0765***	-0.0164***	1					
AGE	-0.0264**	0.1385***	0.1142***	-0.0040**	-0.0195***	-0.0530***	1				
No.Branches	0.0487***	0.0109**	-0.0390***	0.0370***	-0.0024	-0.0230***	0.0957***	1			
Lerner	-0.0022***	-0.0124**	0.0778***	-0.0351***	-0.0155***	-0.0032	-0.0722***	-0.5230***	1		
Int_dif	-0.0341***	-0.0117**	0.0656***	-0.0490***	-0.0055*	0.0151**	-0.1022***	-0.6587***	0.5845***	1	
gdpg_regio	0.0009	-0.0523***	-0.0933***	0.0579***	0.0104***	0.0808***	-0.0630**	0.0343**	-0.0853**	-0.0975***	1

Note: \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

### 3.4. Econometric Model

The empirical model is specified as follows:

$$TDR_{it} = \beta_0 + \beta_1 No.Branches_{rt} + \beta_2 Lerner_{rt} + \beta_3 Int_{diff,rt} + \beta_4 gdpg_{rt} + \beta_5 SIZE_{it} + \beta_6 AS_{it} + \beta_7 PROF_{it} + \beta_8 GROWTH_{it} + \beta_9 RISK_{it} + \beta_{10} AGE + \mu_i + \varepsilon_{it} \quad (1)$$

where  $i$  is the firm,  $r$  is the region, and  $t$  is the time period. The term  $\mu_i$  represents the unobservable individual effects, while  $\varepsilon_{it}$  is the possible heteroscedastic random error.

This paper exploits many advantages of using panel data to test the hypotheses stated in Section 2. We are able to consider individual unobservable firm heterogeneity (such as managerial ability and other nonmeasurable specificities of companies—possibly correlated with some explanatory variables) and the changes in the model's variables over time. Hence, as we mentioned above, we base our inference on data that are more informative about the financial behaviour of SMEs. This approach leads to an estimation that is less affected by collinearity problems and is more efficient.

The empirical model is first estimated by using fixed effects (within data transformation) and random effect estimators to take the individual effects into account. We believe that the hypothesis of the random effect estimator that firm-level variables are not correlated with the unobservable individual effects is quite a strong assumption. The Hausman test is carried out to ascertain whether the individual effects are fixed or random. In our analysis, this test confirms that the fixed effects model is appropriate, while the random effect model runs the risk of not being consistent. Therefore, we will present only the results of estimations with a fixed effect model. The Breusch–Pagan test rejects the null hypothesis of the constant variance of the errors. For this reason, clustered standard errors are used to address the problem.

Second, to handle the potential endogeneity problems of some explanatory variables, we use the two-stage least squares within estimator (2SLS-IVwithin). We test for the possibility that the firm-level variables (except age of firm) are endogenous, i.e., simultaneously correlated with the error term. This new regression uses the first lag of asset structure, size of firm, profitability, risk and growth as instrumental variables.

Finally, as a third estimator, we apply the Hausman–Taylor method to have an estimator that can explicitly control for sectors and regional dummies (the within transformation of the other two estimators does not allow the introduction of time invariant variables). This also allows us to take into consideration in our specification sector and regional dummies (i.e., measurable individual effects

that cannot be estimated by the fixed effect method based on the within transformation), and, at the same time, to also handle the potential endogeneity problems described above. Nevertheless, a second Hausman test that compares the estimation of IV2SLS and the Hausman–Taylor estimator highlights that only the former is a consistent estimator in this case.

## 4. Results and Discussion

### 4.1. Baseline Model Results

Table 4 presents the estimates of our empirical specification. In commenting on the results, special attention will be devoted to the regional variables. Overall, the results obtained by the three estimators are similar, and, more importantly, almost all the regional variables are significant.

The proxy of regional financial development (Nº Branches) is significant and has a positive sign. Therefore, the positive relation between financial development and debt is confirmed, fulfilling our first hypothesis. This result is consistent with that of La Rocca et al. [7] and Palacín-Sánchez and di Pietro [9]. Unlike La Rocca et al. [7], we use panel data instead of a one-year cross section, enabling us to control for change in the Nº Branches across years.

The Lerner variable is significant for the three estimators, and the sign of the coefficient is negative, indicating that less competition in the banking sector has the effect of a lower use of debt by SMEs. Thus, we confirm our second hypothesis H2a. This result is consistent with Boot and Thakor [24], Beck et al. [14], and Palacín-Sánchez and di Pietro [9].

The interest rate spread paid on cash loans with the Centre-North (Int\_diff) has a negative, but not significant, sign in all the regressions. The disincentive of a high interest rate for SMEs to apply for external funding is perhaps difficult to capture at the regional level. It is more probable that different SMEs inside the same region can obtain heterogeneous borrowing conditions depending on their own default risk, the availability of collateral, and the degree of asymmetric information. Another possibility is that credit rationing during the 2008–2010 crisis made it difficult to obtain loans on any terms. This possibility is why it is interesting to divide what is shown by the estimates before and after the crisis.

Finally, as the regional GDP growth (gdpg\_regio) is always significantly positive, we validate our fourth hypothesis—in regions with relatively higher economic growth, firms use bank debt more intensively to finance their investments. This result is consistent with Demirguc-Kunt and Maksimovic [17], Booth et al. [18], De Jong et al. [19], and Palacín-Sánchez and di Pietro [9].

**Table 4.** Estimation results.

Variables	Fixed Effects Clustered St. error	IV2SLS	Hausman-Taylor
Constant	−0.083 *** (−2.44)	−0.036 *** (−2.14)	−0.099 *** (−2.56)
No.Branches	0.002 ** (4.47)	0.002 *** (3.89)	0.004 *** (4.15)
Lerner	−0.36 ** (−2.47)	−0.21 ** (2.33)	−0.111 *** (−3.84)
Int_diff	−0.007 (−0.59)	−0.005 (−0.69)	−0.019 (−0.33)
gdpg_regio	0.085 *** (8.24) (−4.01)	0.030 *** (6.46) (3.81)	0.054 *** (9.11) (−10.82)
SIZE	0.049 *** (39.56)	0.035 *** (22.71)	0.049 *** (42.44)
AS	0.018 *** (5.15)	0.191 *** (6.36)	0.012 *** (3.85)

**Table 4.** Cont.

Variables	Fixed Effects Clustered St. error	IV2SLS	Hausman-Taylor
PROF	-0.219 *** (-60.87)	-0.221 *** (-53.57)	-0.215 *** (-64.35)
GROWTH	-0.016 *** (-19.82)	-0.012 *** (-11.57)	-0.015 *** (-19.93)
RISK	0.012 *** (6.23)	0.012 *** (5.87)	0.013 *** (6.67)
AGE	-0.0006 ** (-0.66)	-0.0009 *** (-3.23)	-0.0009 *** (-6.53)
Sector dummies	No	No	Yes
Regional dummies	No	No	Yes
F-statistic	511.75 ***		
Wald test		163000 ***	6738.90 ***
First Hausman Test (Fe vs RE)	265 ***		
Second Hausman Test (FE vs HT)			640.75 ***
Number of Observations	157,625	115,410	157,625

Note: \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

With respect to the firm variables, asset structure, size, profitability, and age are significant and have the expected sign. These results are consistent with those of authors such as Michaelas et al. [35], Sogorb-Mira [36], and Degryse et al. [37]. On the other hand, the variable growth and business risk have an opposite sign to the one we expected. The sign of growth suggests that companies use different resources to finance debt to finance their growth, as also shown by Sarno [11]. The mixed sign of business risk was also discussed in earlier empirical evidence [18,19,41]. However, we cannot draw conclusions from this result due to the elementary measurement made from the operational risk, as also happened to Michaelas et al. [37].

#### 4.2. A Comparative Analysis between the No-Crisis and the Crisis Period

During the financial crisis (2008–2010), the Italian banking sector experienced several problems, such as credit rationing, the capitalisation of various entities (including two of the five major banks in the country), and a huge increase in the insolvency ratio.

To examine the possible differences in our regression due to the impact of the economic situation, especially in the regional financial variables, we split the sample into no-crisis (2004–2007) and crisis (2008–2010) periods. The results of this analysis are presented in Table 5.

Table 5 shows certain differences between the two periods with respect to some explanatory variables. The first result to highlight is the significantly negative relation between the cost of debt (int\_diff) and the level of debt before the crisis. In other words, as expected, in normal conditions of the debt markets, a higher cost of debt implies less use of debt, which has an important implication, because in Italy, large differences exist among regions. This variable is not significant in the crisis period, perhaps because with the new conditions, access to credit is difficult regardless of price [13]. For the same reason, the No.Branches variable also ceases to be significant in the crisis period, showing that the development of the financial sector loses its influence in the capital structure of SMEs in the context of financial crisis. In contrast, we observe that the regional GDP growth (gdpg-regio) only maintains its statistical significance during the crisis period, suggesting that the regional economy is particularly relevant to explain the level of indebtedness of SMEs in times of crisis. Overall, hypotheses H1 and H3 are not confirmed in the crisis period, hypothesis H2a is confirmed in both periods (no-crisis and crisis), and hypothesis H4 is only confirmed in the crisis period. Firm variables keep their signs

and statistical significance. However, the risk variable only maintains its statistical significance in the pre-crisis period.

**Table 5.** Comparative analysis between the pre-crisis and crisis periods.

Variables	Fixed Effects Clustered St. Error (2004–2007)	Fixed Effects Clustered St. Error (2008–2010)
Constant	−0.369 *** (−8.27)	−0.238 *** (−3.31)
No.Branches	0.011 *** (3.50)	0.0009 (0.811)
Lerner	−0.344 ** (−2.01)	−0.404 ** (−2.39)
Int_diff	−0.045 *** (−3.04)	−0.023 (−1.57)
gdpg_regio	0.024 (0.79)	0.070 *** (6.49)
SIZE	0.078 *** (43.92)	0.065 *** (19.13)
AS	0.194 *** (33.31)	0.154 *** (19.72)
PROF	−0.203 *** (−44.68)	−0.229 *** (−36.72)
GROWTH	−0.010 *** (−10.67)	−0.022 *** (−13.27)
RISK	0.015 *** (4.8)	0.029 (0.89)
AGE	−0.0026 ** (−7.57)	−0.005 *** (−12.49)
Sector dummies	No	No
Regional dummies	No	No
F-statistic	373.5 ***	172.19 ***
First Hausman Test (Fe vs RE)	178 ***	158 ***
Number of Observations	98,278	59,455

Note: \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## 5. Conclusions

This study aims to offset the lack of a regionalised approach in the identification of the relationship between financial and economic factors in the capital structure of SMEs. Nevertheless, at least in southern Europe, intracountry differences are large. The regional analysis enables better identification of the relationship between institutional factors and the capital structure of SMEs.

Our article empirically analyses the regional financial and economic differences in Italian SME leverage from 2004 to 2010, using an unbalanced panel dataset of 159,026 observations. Our results suggest that differences in the degree of financial sector development, banking concentration, and the local economic situation have a significant impact on the level of leverage for SMEs. These findings are consistent with studies on capital structure that use the regional level and, more generally, with authors who claim that institutional factors influence how firms are financed [4,6,7,9,17,20,42,43]. Three of the four hypotheses formulated have been verified. The estimation results show that a more developed financial system favours the use of debt as a financial source and that a more concentrated banking market reduces the use of debt by SMEs. Moreover, regional economic development has a positive

effect on SME debt. However, the hypothesis of the influence of debt costs on leverage has been only partially verified.

Moreover, when we analysed the influence of regional variables, distinguishing between the pre-crisis and the crisis periods, the results show that the cost of debt and the N° branches have only been verified in the pre-crisis period, and the regional GDP growth maintains only its statistical significance during the crisis period. These differences in the significance of the regional variables support the fact that, currently, the new conditions of access to credit have become more difficult. Therefore, the relationship between these variables and the level of leverage of SMEs depends on the economic situation.

Overall, our research shows that in a country with large regional differences, such as Italy, the decision of how to finance investments involves not only business criteria but also institutional factors, creating a diversity of opportunities depending on where the enterprise is located. Moreover, these regional differences could influence regional economic resilience because the more financial resources available, the greater the capacity to adapt and thrive under adverse environmental conditions. According to our results, it is important to take into account the regional financial system, especially in the case of SMEs, which are more affected by difficulties in accessing financing compared to large companies. This effect is especially important in times of economic instability. Moreover, our findings should be used by policymakers to reduce these differences, since government actions and decision-making are the main factors affecting social resilience, which can be considered a guarantee of regional resilience [12].

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## References

1. Modigliani, F.; Miller, M. The Cost of Capital, Corporation Finance and the Theory of Investment. *Am. Econ. Rev.* **1958**, *48*, 61–297.
2. La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A.; Vishny, R.W. Law and Finance. *J. Polit. Econ.* **1998**, *106*, 1113–1155. [[CrossRef](#)]
3. Rajan, R.G.; Zingales, L. What Do We Know about Capital Structure? Some Evidence from International Data. *J. Financ.* **1995**, *50*, 1421–1460. [[CrossRef](#)]
4. Giannetti, M. Do Better Institutions Mitigate Agency Problems? Evidence from Corporate Finance Choices. *J. Financ. Quant. Anal.* **2003**, *38*, 185–212. [[CrossRef](#)]
5. Utrero-González, N. Banking regulation, institutional framework and capital structure: International evidence from industry data. *Q. Rev. Econ. Financ.* **2007**, *47*, 481–506. [[CrossRef](#)]
6. Hernández-Cánovas, G.; Koëter-Kant, J. SME financing in Europe: Cross-country determinants of bank loan maturity. *Int. Small Bus. J.* **2011**, *29*, 489–507. [[CrossRef](#)]
7. La Rocca, M.; la Rocca, T.; Cariola, A. The influence of local institutional differences on the capital structure of SMEs: Evidence from Italy. *Int. Small Bus. J. Res. Entrep.* **2010**, *28*, 234–257. [[CrossRef](#)]
8. Palacín-Sánchez, M.J.; Ramírez-Herrera, L.M.; di Pietro, F. Capital structure of SMEs in Spanish regions. *Small Bus. Econ.* **2013**, *41*, 403–519. [[CrossRef](#)]
9. Palacín-Sánchez, M.J.; di Pietro, F. The Role of the Regional Financial Sector in the Capital Structure of Small and Medium-Sized Enterprises (SMEs). *Reg. Stud.* **2016**, *50*, 1232–1247. [[CrossRef](#)]
10. Charron, N.; Dijkstra, L.; Lapuente, V. Regional Governance Matters: Quality of Government within European Union Member States. *Reg. Stud.* **2014**, *48*, 68–90. [[CrossRef](#)]

11. Sarno, D. Capital structure and growth of the firms in the backward regions of the south Italy. *Appl. Financ. Econ.* **2008**, *18*, 821–833. [[CrossRef](#)]
12. Peng, C.; Yuan, M.; Gu, C.; Peng, Z.; Ming, T. A review of the theory and practice of regional resilience. *Sustain. Cities Soc.* **2017**, *29*, 86–96. [[CrossRef](#)]
13. Kremp, E.; Sevestre, P. Did the crisis induce credit rationing for French SMEs? *J. Bank. Financ.* **2013**, *37*, 3757–3772. [[CrossRef](#)]
14. Beck, T.; Demirguc-Kunt, A.; Maksimovic, V. Financial and legal constraints to growth: Does firm size matter? *J. Financ.* **2005**, *60*, 137–177. [[CrossRef](#)]
15. Nivorozhkin, E. Financing choices of firms in EU accession countries. *Emerg. Mark. Rev.* **2005**, *6*, 138–169. [[CrossRef](#)]
16. Cornelli, F.; Portes, R.; Schaffer, M.E. The Capital Structure of Firms in Central and Eastern Europe. *Delta* **1996**.
17. Demirguc-Kunt, A.; Maksimovic, V. Institutions, financial markets, and firm debt maturity. *J. Financ. Econ.* **1999**, *54*, 293–336. [[CrossRef](#)]
18. Booth, L.; Aivazian, V.; Demirguc-Kunt, A.; Maksimovic, V. Capital structures in developing countries. *J. Financ.* **2001**, *56*, 87–130. [[CrossRef](#)]
19. De Jong, A.; Kabir, R.; Nguyen, T.T. Capital structure around the world: The roles of firm- and country-specific determinants. *J. Bank. Financ.* **2008**, *32*, 1954–1969. [[CrossRef](#)]
20. González, V.M.; González, F. Influence of bank concentration and institutions on capital structure: New international evidence. *J. Corp. Financ.* **2008**, *14*, 363–375. [[CrossRef](#)]
21. Kirch, G.; Terra, P.R.S. Determinants of corporate debt maturity in South America: Do institutional quality and financial development matter? *J. Corp. Financ.* **2012**, *18*, 980–999. [[CrossRef](#)]
22. Petersen, M.A.; Rajan, R.G. The Effect of Credit Market Competition on Lending Relationships. *Q. J. Econ.* **1995**, *110*, 407–443. [[CrossRef](#)]
23. Corvoisier, S.; Gropp, R. Bank concentration and retail interest rates. *J. Bank. Financ.* **2002**, *26*, 2155–2189. [[CrossRef](#)]
24. Boot, A.W.A.; Thakor, A.V. Can relationship banking survive competition? *J. Financ.* **2000**, *55*, 679–713. [[CrossRef](#)]
25. Cocco, P. Bank competition and regional differences. *Econ. Lett.* **2008**, *101*, 13–16. [[CrossRef](#)]
26. Leland, H.E. Corporate Debt Value, Bond Covenants, and Optimal Capital Structure. *J. Financ.* **1994**, *49*, 1213–1252. [[CrossRef](#)]
27. Goldstein, R.S.; Ju, N.; Leland, H.E. An Ebit-Based Model of Dynamic Capital Structure. *J. Bus.* **1998**, *74*, 483–512. [[CrossRef](#)]
28. Deesomsak, R.; Paudyal, K.; Pescetto, G. The determinants of capital structure: Evidence from the Asia Pacific region. *J. Multinatl. Financ. Manag.* **2004**, *14*, 387–405. [[CrossRef](#)]
29. Bas, T.; Muradoglu, G.; Phylaktis, K. *Determinants of Capital Structure in Developing Countries*; Cass Business School: London, UK, 2009.
30. Bartholdy, J.; Mateus, C. *Financing of SME's: An Asset Side Story*. 2008. Available online: <https://ssrn.com/abstract=1098347> (accessed on 18 August 2019). [[CrossRef](#)]
31. Ju, N.; Ou-Yang, H. Capital Structure, Debt Maturity, and Stochastic Interest Rates. *J. Bus.* **2006**, *79*, 2469–2505. [[CrossRef](#)]
32. Chang, C.C.; Lin, J.B.; Yang, C.C. The effect of stochastic interest rates on a firm's capital structure under a generalized model. *Rev. Quant. Financ. Account.* **2015**, *45*, 695–719. [[CrossRef](#)]
33. D'Italia, B. *Annual Report 2013*; Printing and Publishing Division of the Bank: Rome, Italy, 2014.
34. Van der Wijst, N.; Thurik, R. Determinants of small firm debt ratios: An analysis of retail panel data. *Small Bus. Econ.* **1993**, *5*, 55–65. [[CrossRef](#)]
35. Michaelas, N.; Chittenden, F.; Poutziouris, P. Financial Policy and Capital Structure Choice in U.K. SMEs: Empirical Evidence from Company Panel Data. *Small Bus. Econ.* **1999**, *12*, 113–130. [[CrossRef](#)]
36. Sogorb-Mira, F. How SME uniqueness affects capital structure: Evidence from a 1994–1998 Spanish data panel. *Small Bus. Econ.* **2005**, *25*, 447–457. [[CrossRef](#)]
37. Degryse, H.; de Goeij, P.; Kappert, P. The impact of firm and industry characteristics on small firms' capital structure. *Small Bus. Econ.* **2012**, *38*, 431–437. [[CrossRef](#)]

38. Petersen, M.A.; Rajan, R.G. Does distance still matter? The information revolution in small business lending. *J. Financ.* **2002**, *57*, 2533–2570. [[CrossRef](#)]
39. Coccores, P.; Pellecchia, A. Multimarket contact, competition and pricing inbanking. *J. Int. Money Financ.* **2013**, *37*, 187–214. [[CrossRef](#)]
40. Carbó-Valverde, S.; Rodrguez-Fernndez, F.; Udell, G.F. Bank market power and SME financing constraints. *Rev. Financ.* **2009**, *13*, 309–340. [[CrossRef](#)]
41. Psillaki, M.; Daskalakis, N. Are the determinants of capital structure country or firm specific? *Small Bus. Econ.* **2009**, *33*, 319–333. [[CrossRef](#)]
42. Fan, J.P.H.; Twite, G.J.; Titman, S. An International Comparison of Capital Structure and Debt Maturity Choices. *J. Financ. Quant. Anal.* **2012**, *47*, 23–56. [[CrossRef](#)]
43. Bontempi, M.E. The Dynamic Specification of the Modified Pecking Order Theory: Its Relevance to Italy. *Empir. Econ.* **2002**, *27*, 1–22. [[CrossRef](#)]



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