FIRM LEVEL DETERMINANTS OF CAPITAL STRUCTURE IN ALGERIA

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ABSTRACT

This study analyzes the capital structure determinants in a sample of 207 non-financial Algerian enterprises (2013-2017).The Tobit-panel random effects model gives the following results: the firm-level determinants at the 1% level are : the profitability, the tangibility, the debt-tax shield DTS and the non-debt tax shield NDTS . A profitable company can easily take on debt at a low interest rate. The tangible assets are used as a collateral. The Algerian enterprises take on debt in order to benefit from the debt-tax deductibility. The positive impact of the DTS variable confirms the positive impact of the profitability variable. The debt-tax deductibility is useful when a company is profitable. The NDTS is an alternative funding source for the enterprises. For the state-owned subsample, the debt ratio decreases when the firm size increases. The small state-owned enterprises have a low self-financing. These enterprises are financed by the debt. For the services field subsample, the liquidity is used as a collateral.

KEY WORDS

Capital structure, firm level determinants, non-financial enterprises, panel data, Algeria.

CLASSIFICATION: C20, C23, G30, G32

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محددات هيكل رأس المال على مستوى المؤسسة في الجزائر

ملخص

هذا البحث يدرس محددات الهيكل المالي لعينة من معطيات البانل لـ 207 مؤسسة غير مالية جزائرية للفترة 2013-2017. يعطي نموذج توبت في ظل معطيات البانل للآثار العشوائية النتائج التالية: المحددات عند مستوى الدلالة 1% هي الربحية، الضمانات، الاقتصاد الضريبي الناجم عن المديونية والاقتصاد الضريبي الغير متعلق بالمديونية.

المؤسسات المربحة يمكن لها الحصول على الديون بسهولة وبنسب فائدة منخفضة. الأصول العينية بمثابة ضمانات من أجل الحصول على القروض. المؤسسات الجزائرية تستدين من أجل الاستفادة من الاقتصاد الضريبي الناجم عن المديونية. الأثر الموجب للاقتصاد الضريبي يدعم الأثر الموجب للربحية. الاقتصاد الضريبي الناجم عن المديونية ممكن لما تكون المؤسسة مربحة. من جهة أخرى الاقتصاد الضريبي الغير متعلق بالمديونية يعتبر مصدر تمويلي بديل للمؤسسات الجزائرية. بالنسبة للعينة الجزئية للمؤسسات العمومية، تنخفض المديونية لما يزيد حجم المؤسسة. المؤسسات العمومية صغيرة الحجم لها تمويل ذاتي محدود فبالتالي تمويلها يتم عبر الديون. بالنسبة للعينة الجزئية لمؤسسات القطاعات الخدماتية، السيولة تعوض الأصول العينية كضمانات للقروض.

كلمات المفتاحية

هيكل رأس المال، محددات على مستوى المؤسسة، مؤسسات غير مالية، معطيات بانل، الجزائر.

تصنيف جال: C20, C23, G30, G32

DÉTERMINANTS DE LA STRUCTURE DU CAPITAL AU NIVEAU DE L'ENTREPRISE EN ALGÉRIE

RÉSUMÉ

Cette étude analyse les déterminants de la structure du capital pour un panel de 207 entreprises algériennes non financières (2013-2017). Le modèle Tobit à effets aléatoires donne ceci : les déterminants (seuil 1%) sont la profitabilité, la tangibilité, l'économie d'impôt de la dette et l'économie d'impôt hors dette. Les entreprises profitables s'endettent facilement avec des taux inférieurs. Les actifs tangibles servent de garanties. Les entreprises s'endettent pour bénéficier de la déductibilité fiscale de la dette. L'impact positif de celle-ci confirme celui de la profitabilité. La déductibilité fiscale est possible lorsque l'entreprise est bénéficiaire. L'économie d'impôt hors endettement est une source de financement alternative. Pour les entreprises publiques, la dette diminue lorsque la taille augmente. Les petites tailles ont un autofinancement limité et s'endettent facilement. Pour les entreprises des services, la liquidité remplace les actifs tangibles comme garanties.

MOTS CLÉS

Structure du capital, déterminants au niveau de l'entreprise, entreprises non financières, données de panel, Algérie.

JEL CLASSIFICATION : C20, C23, G30, G32

INTRODUCTION

This study sheds light on the firm-level determinants of the capital structure in a set of panel data of 207 non-financial Algerian enterprises over the period 2013-2017 (1035 observation).

The research tests the significance of some of the main firm-level determinants in the literature: the firm size, the profitability, the tangibility, the liquidity, the debt tax shield and the non-debt tax shield (Toumi & Dadene, 2014).

The regression model is based on a Tobit model for the panel data, since our dependent variable (debt ratio) is a limited variable, included in [0,1] interval (Gujarati, 2003).

The study covers a large representative sample. To the best of our knowledge, our sample is the largest compared to Algerian empirical studies (appendix, table 1). It covers a recent period and contains both large companies and SMEs, state-owned and private companies, manufacturing and services fields.

This research contributes to the empirical literature. It aims to improve the understanding of the financial behavior of companies in a developing economy as Algeria. The originality of this study is that it uses data of a developing economy. The paper attempts to fill the gap in empirical literature. The paper aims to produce a new empirical knowledge.

1- THE EMPIRICAL LITERATURE REVIEW

The main usual firm-level determinants of the capital structure are: the firm size, the profitability, the tangibility, the liquidity, the debt-tax shield and the non-debt tax shield (El-Diftar, 2020 ; Kaźmierska& al, 2015 ; Leary & Roberts 2014 ; Toumi & Dadene 2014 ; Chakraborty, 2010 ; Frank& Goyal, 2003, p. 240).

1.1- The firm size variable

In a big company, the information costs are low and the financial statements are generally transparent. As a result, the debt access becomes easier. The debt ratio is high in a big company. The bank

credit rationing is negatively related to the size of the company (Cenni& al, 2015).

A big company has a low asymmetric information level. Generally, a large company has more tangible assets and more earnings. The bankruptcy costs are lower. The size variable is generally computed by: the natural log of sales, the natural log of total assets (Toumi & Dadene, 2014). Many studies expect a positive impact of the size variable (Fama & French, 2002 ; Ilyukhin, 2017 ; Amraoui& al, 2018). However, other studies expect a negative impact (Frank & Goyal, 2003).

1.2- The profitability variable

According to the Pecking Order Theory, a profitable company uses its high earning as the main financial source. The debt ratio decreases when the profitability variable increases (Leary & Roberts, 2010; Dufour & Molay, 2010).

However, the Trade Off Theory suggests that a profitable company has a higher debt ratio. The debt is easier for a profitable company. The debt ratio increases when the profitability ratio increases. The profitability variable is generally computed by following ratios: the ROA ratio (Return On Assets), the operating incomes to sales ratio, the operating incomes to total assets ratio (Kaźmierska-Jóźwiak& al, 2015 ; Chakraborty, 2010; Amraoui& al, 2018; Ilyukhin, 2017).

1.3- The tangibility variable

The tangible assets may have a positive effect on the debt ratio. These assets are used as collateral for a loan (Abdul Hadi& al, 2016; Dufour & Molay, 2010). The tangibility level reduces the adverse selection and the moral hazard costs (Cassar & Holmes, 2003).

The debt level is greater in the real estate companies comparing with the technological research companies (Saarani & Shahadan, 2013). The tangibility variable is generally computed by the following ratio: the fixed assets to total assets ratio (Bayrakdaroglu& al, 2013; Citak& Ersoy, 2012; Faulkender and al., 2012).

1.4- The Liquidity variable

The impact of the liquidity variable can be in both directions (positive, negative). According to the Pecking Order Theory, a company with a high liquidity level has a less debt level. This company prefers to use the internal resources instead of the debt. The liquidity variable has a negative effect on the debt level (Ozkan, 2001; Kaźmierska-Jóźwiak& al, 2015). However, a company with a high liquidity level can easily support higher debt costs. The liquidity variable has a positive effect on the debt ratio.

The liquidity variable is generally computed by the following ratio: the current assets to current liabilities ratio (Ozkan, 2001; Saarani & Shahadan, 2013; Toumi & Dadene, 2014).

1.5- The debt-tax shield variable

The debt-tax shield variable refers to the debt-tax advantage (the interest payments are deductible from the corporate income tax). The company takes on debt in order to benefit from the deductibility of loan interest (Amraoui& al, 2018; Bayrakdaroglu & al, 2013). The debt-tax shield variable is generally computed by the following ratios: the tax payment to profit before tax ratio, the tax payment to EBITDA ratio (Napompech, 2013; Saarani & Shahadan, 2013).

1.6- The non-debt tax shield variable

The non-debt tax shield variable refers to the tax advantage of the amortization and depreciation. The tax deductibility of the amortization and depreciation can be a substitute for the debt-tax deductibility (Ilyukhin, 2017; Abdul Hadi & al, 2016; Bayrakdaroglu, Ege, Yacizi, 2013; Colot& Croquet, 2007; Citak& Ersoy, 2012). The non-debt tax shield variable is computed by: the amortization and depreciation to EBITDA ratio.

Regarding with the empirical validations for the Algerian enterprises, it appears that main determinants are: the profitability, the tangibility and the firm size variables (appendix, table 1).

2- METHODS

This study uses a panel data of 207 non-financial Algerian enterprises (period 2013-2017), in order to analyze the determinants of the long-term debt ratio. The data is collected online from the website of the NCCR National Center of Commercial Register (sidjilcom.cnrc.dz). The dependent variable (DEBT) is computed by the following ratio: the long-term liabilities to total assets ratio (Fama & French, 2002, p. 8).The panel data model specification is as follows:

$$DEBT_{jt} = a_0 + a_1 SIZE_{jt} + a_2 ROA_{jt} + a_3 TANG_{jt} + a_4 DTS_{jt} + a_5 NDTS_{jt} + a_6 LIQ_{jt} + u_j + u_t + v_{jt}$$

j = {1, 2, …, 207} (207 enterprises).
t = {2013, 2014, …, 2017} (5 years)

Table 1. The regression variables

Var	Measures	Expected sign
DEBT	Long-term liabilities to total assets	-
SIZE	Size = log of total assets	Positive
ROA	Profitability = return to total assets	Positive
TANG	Tangibility = fixed assets to total assets	Positive
DTS	Debt tax shield = corporate tax payment to EBITDA	Positive
NDTS	Non-DTS = amortization and depreciation to EBITDA	Negative
LIQ	Liquidity = current assets to current liabilities	Negative

Source: author

3- RESULTS

The regressions and tests are performed with STATA 15.1. The sample contains 207 non-financial Algerian enterprises (table 2).

Table 2. The number of enterprises sorted by category

	Manufacturing	Others	∑
State owned	24	14	38
Private	29	140	169
∑	53	154	207

Source: author

The sample mainly consists of the private companies outside the manufacturing activities (services). The sample is representative of the Algerian companies. The state-owned enterprises represent 18.35% of the sample. The manufacturing enterprises represent 25.6%.

Table 3. Descriptive statistics

Variable	Mean	Standard deviation	Min	Max
DEBT	0.418724	8.451456	0	271.5663
SIZE	19.03824	3.184093	13.09673	29.98905
ROA	0.0600252	0.2202816	-4.88076	2.29544
TANG	0.2451905	0.2524366	0	1
DTS	0.1817834	2.602625	-4.625642	82.30074
NDTS	-0.3347131	15.44647	-438.9637	89.33621
LIQ	49.69102	595.1352	0	16317.64

Source: author

Except a few cases, the dependent variable is included in [0,1] interval. There are only 24 observations (total of 1035 observations) appear with a debt ratio greater than 1. These enterprises appear with a negative equity (losses). We keep these enterprises into the sample.

Table 4. Correlation matrix

	DEBT	SIZE	ROA	TANG	DTS	NDTS	LIQ
DEBT	1						
SIZE	0.0418	1					
ROA	0.3131	-0.0745	1				
TANG	0.0686	0.4184	-0.0374	1			
DTS	0.0276	0.0254	0.0105	-0.0010	1		
NDTS	0.0028	0.0200	0.6658	0.0310	0.1816	1	
LIQ	0.0032	-0.0088	-0.0195	-0.0679	-0.0062	0.0019	1

Source: author

The Fisher test (pooled OLS model vs panel model) gives F(206,822) = 1.77 > 5% (Prob>F = 0.0000). According to the test, the null hypothesis (H_0: all $u_j = 0$) is rejected. The alternative hypothesis H_1 is accepted. The panel model (fixed, random effects) is selected.

The Hausman specification test (random vs fixed effects models) gives Chi2 (6) = 90.03 (Prob>Chi(2) = 0.0000 < 5%).

This result indicates that the fixed effects model is better. But, the Hausman specification test ignores that the dependent variable is a limited variable [0,1]. The Tobit- random effects model is consistent with the limited dependent variable (Gujarati, 2003).

The fixed effects regression is based on the LSDV method (Least Square Dummy variable), but the random effects regression is based on the GLS method (Generalized Least Square). The latest one is appropriate for the limited dependent variable. With the Tobit model (the censored dependent variable), we can estimate both the fixed and the random effects models (Maddala, 1987). The most significant determinants are: ROA, TANG, DTS and NDTS (table 5).

Table 5. Regressions

	Panel GLS	Panel fixed effect	Panel random effect	Tobit panel random effect
SIZE	0.1550264	-1.37455	0.1230169	
	(1.89)	(-4.11)***	(1.35)	
ROA	22.88387	31.45736	24.42091	24.90908
	(15.67)***	(17.63)***	(16.34)***	(15.55)***
TANG	2.712036	9.311715	3.18021	3.886643
	(2.63)***	(3.93)***	(2.82)***	(3.60)***
DTS	0.3099961	0.3758603	0.3221612	0.3278035
	(3.33)***	(3.85)***	(3.48)***	(3.56)***
NDTS	-0.2272354	-0.2955252	-0.2402329	-0.2439955
	(-10.75)***	(-12.64)***	(-11.34)***	(-11.28)***
LIQ	0.0003153	-0.0000235	0.0002922	
	(0.79)	(-0.04)	(0.70)	
Const	-4.719359	22.25029	-4.322422	-2.170673
	(-3.14)***	(3.47)***	(-2.58)***	(-5.32)***

+/- 0.00000: regression coefficient. (+/-0.00): Student statistic
***: significant at 1% level

Source: author

The Breusch-Pagan Lagrangian multiplier test for the random effects gives Chibar2(01) = 12.40 (Prob > Chibar2 = 0.0002 < 5%). The null hypothesis (H_0: $\sigma_u^2 = 0$) is rejected. The alternative hypothesis (H_1: $\sigma_u^2 \neq 0$) is accepted.The random effects model is selected.

The Harris-Tzavalis test for the unit root is appropriate when the T (number of periods) is limited. The Harris-Tzavalis test gives P-value = 0.0000 < 5% for all variables. The null hypothesis (panels contain unit roots) is rejected. The alternative hypothesis (stationary) is accepted.

The VIF (Variance Inflation Factor) test for the multi collinearity gives all the VIF < 10 (1/VIF > 0.1). There is no collinearity.

Table 6. VIF test for multicollinearity

Variable	VIF	1/VIF
NDTS	1.92	0.520664
ROA	1.87	0.535648
SIZE	1.22	0.817144
TANG	1.22	0.818891
DTS	1.06	0.944505
LIQ	1.01	0.993777

Source: author

The likelihood ratio test for the heteroskedasticity gives the statistic LRchi2(206) = -27208.58 with Prob > Chi2 = 1.0000 > 0.05. The null hypothesis (H_0: homoskedasticity) is accepted. The alternative hypothesis (H_1: heteroskedasticity) is rejected.

The Wooldridge test for the autocorrelation in the panel data gives the statistic F(1,206) = 3.69 with Prob > F = 0.0561 > 5%. The null hypothesis (H_0: no first-order autocorrelation) is accepted. There is no serial correlation.

The Wilcoxon rank-sum test (the Mann-Whitney test) checks if the debt ratio is significantly different between the manufacturing subsample and the other subsample. A dummy variable INDUS is introduced (1 for the manufacturing activities, 0 others). The test gives Z statistic = -9.947 with Prob >|*Z*| = 0.000 < 5%. The null hypothesis (H_0: DEBT [INDUS=0] = DEBT [INDUS=1]) is rejected. The debt ratio is different between the manufacturing activities and the other activities (services field). The same test is performed with another dummy variable STATE (1 for the state-owned enterprises, 0 others). The test gives Z statistic = -14.991 with Prob >|*Z*| = 0.000 < 5%. The null hypothesis is rejected. The debt ratio is different between state-owned enterprises and private enterprises.

Table 7 shows regressions for the subsamples (state owned enterprises, private enterprises, manufacturing enterprises, others). The variables ROA and TANG are significant at the 1% level, with a positive sign for all subsamples. The firm's size variable is significant only for the state-owned enterprises. The DTS variable is significant only for the manufacturing enterprises.

Table 7. Regressions- subsamples

	State owned N=38	**Private N=169**	**Manufacturing N=53**	**Other N=154**
SIZE	-1.368617			
	(-3.64)***			
ROA	101.5893	0.2326071	53.21683	0.2603578
	(36.61)***	(2.32)**	(14.61)***	(2.87)***
TANG	9.057116	0.3443869	8.70391	0.3896481
	(2.99)***	(4.52)***	(2.75)***	(5.57)***
DTS			0.6272171	
			(4.02)***	
NDTS		-0.0023375	-0.5280299	
		(-1.76)*	(-12.07)***	
LIQ				0.000352
				(5.98)***

Tobit panel random effects.
+/- 0.00000: regression coefficient. (+/-0.00): Student statistic
***: significant at 1% level. **: significant at 5%. *: significant at 10%.

Source: author

4- DISCUSSION

This paper studies the firm-level determinants of the capital structure in a panel data of 207 non-financial Algerian enterprises over the period 2013-2017. The main determinants are (at the 1% level): the profitability variable, the tangibility variable, the debt-tax shield variable and the non-debt tax shield variable.

The variables ROA, TANG and DTS appear with the expected positive sign. The variable NDTS appears with the negative expected sign. All signs are consistent with the Trade-Off Theory (Colot & Croquet, 2007, p.184-185; Cwynar & al., 2015). Our results are consistent with the international empirical studies (table 8).

The profitability and the tangibility variables are the main determinants among countries.

Table 8. International comparisons

Study	Countries	Determinants
Our study	Algeria	Profitability, tangibility, DTS, NDTS
Zerriaa & al 2015	Tunisia	Profitability, Size
Amraoui & al 2018	Morocco	Profitability, tangibility, size, liquidity
Abdul Hadi & al 2016	Egypt Palestine	Profitability, NDTS, liquidity, size, growth
El-Diftar 2020	9 MENA countries except Algeria	Profitability, tangibility, liquidity, market value
Chakraborty 2010	India	Profitability, tangibility, NDTS, growth, Size, R&D
Dufour & Molay 2010	France	Profitability, tangibility, growth, size
Kaźmierska-Jóźwiak & al 2015	Poland	Profitability, tangibility, size, growth prospects, growth Rate
Citak & Ersoy 2012	Turkey	Profitability, tangibility, Size, dividend, CEO duality
Napompech 2013	Thailand	Profitability, tangibility, size
Saarani & Shahadan 2013	Malaysia	Profitability, tangibility, liquidity, size
Cassar & al. 2003	Australia	Profitability, tangibility, growth

Source: author

The positive sign of the profitability variable in our results is consistent with the Trade-Off Theory (Colot & Croquet, 2007The profitability variable is the main firm-level determinant of the capital structure in Algeria. The profitability variable is significant for the different specifications of our model (with the positive expected sign). A 1% increase in the profitability variable leads to 24.9% increase in the debt ratio (table 5 column 5). A profitable company is less risky. It can take on debt at low interest rates. The debt is easier for a profitable company. The banks like the high earnings companies. In addition, the debt can be used as a tax saving.

The positive sign of the profitability variable is consistent with Zerriaa & Noubbigh (2015) for Tunisia, Flannery & Rangan (2006) for North America, Chhapra & Asim (2012) for weaving-textile sector in Pakistan, Adair & Adaskou (2017) for France.

The tangibility variable is a strong firm-level determinant of the capital structure in Algeria. The tangibility variable is significant for the different specifications of our model. A 1% increase in the tangibility variable leads to 3.88% increase in the debt ratio (table 5). The tangible assets (the buildings, the machinery, the tools and furniture) are used as collateral.

The positive sign of the tangibility variable in our results is consistent with both the Trade-Off Theory and the Pecking-Order Theory (Colot & Croquet, 2007). This positive sign is consistent with Citak & Ersoy (2012) for Turkey, Hergli & Toulon (2013) for Tunisia, Delcoure (2007) for transitional European economies, Ali (2011) for India, M'ng & al (2017) for Malaysia, Singapore and Thailand, Dejong & al (2008) for a sample of 42 countries (developed and developing economies).

The debt-tax shield variable appears as a firm-level determinant of the capital structure in Algeria. This result is consistent with the Modigliani & Miller (1963) theory. A 1% increase in the DTS variable leads to 0.327% increase in the debt ratio (table 4). This positive relationship matches with the Trade-Off Theory (Colot & Croquet, 2007). The Algerian companies take on debt in order to benefit from the debt-tax deductibility. The positive sign of the DTS variable confirms the positive sign of the profitability variable. The debt-tax deductibility works when a company is profitable. This positive sign is consistent with Bayrakdaroglu & al (2013) for Turkey.

The non-debt tax shield variable appears as a firm-level determinant in our sample. A 1% increase in the NDTS variable leads to 0.243% decrease in the debt ratio. This expected negative sign matches with the capital structure model of DeAngelo & Masulis (1980). The negative sign is consistent with both the Trade-Off Theory and the Pecking-Order Theory (Cwynar & al., 2015).

The non-debt tax shield reduces the debt-tax advantage. The tax deductibility of amortization and depreciation is a substitute of the debt-tax deductibility (DeAngelo & Masulis, 1980; Titman & Wessels, 1988). A company with a high NDTS has a low debt level. This negative sign is consistent with Abdul Hadi & al (2016) for Egypt and Palestine, Ozkan (2001) for UK, Ilyukhin (2017) for Russia, M'ng & al (2017) for Malaysia, Singapore and Thailand and Deesomsak & al (2004) for Asia Pacific region. The NDTS is an alternative funding source for the Algerian enterprises.

For the state-owned subsample (38 enterprises), the firm's size variable appears as a significant determinant with a negative sign. The debt ratio decreases when the firm size increases. Many studies found the same negative sign (Abdul Hadi & al, 2016; Amraoui & al, 2018). This negative sign can be explained as follows: (1) a big company has a structural high self-financing. (2) Generally, a manager in a small company does not like to open up capital. He prefers to take on debt (Bourdieu& Colin-Sédillot, 1993). (3) In Algeria, a small company can benefit from several financing facilities (Zirek & Zghib, 2016). These reasons explain the negative impact of the size variable on the debt ratio.

For the services field subsample (154 enterprises), the liquidity variable is a significant determinant (a positive sign). A company with a high liquidity can easily take on debt. The enterprises in services field have a limited asset-tangibility. The liquidity is used as collateral.

Finally, our results match with the major studies: the debt ratio is positively correlated to the tangibility variable (Rajan & Zingales, 1995), the profitability variable positively impacts the debt ratio (Fama & French, 2002), the debt tax shield variable positively impacts the debt ratio (Modigliani & Miller, 1963).

CONCLUSION

This paper studies the determinants of capital structure using a panel data of 207 non-financial Algerian enterprises (2013-2017). The main determinants are: the profitability, the tangibility, the debt-tax shield and the non-debt tax shield variables.

All results are consistent with the international empirical studies. The profitability and the tangibility variables are the main determinants (with the positive expected effect). A profitable company is less risky. It can easily take on debt at low interest rates. Furthermore, the Algerian enterprises use the tangible assets as collateral.

The Debt-tax shield variable appears with the expected positive sign. The Algerian companies take on debt in order to benefit from the debt-tax deductibility. The positive impact of the debt-tax shield variable confirms the positive impact of the profitability variable. The debt-tax deductibility is useful when the company is profitable.

The Non-debt tax shield variable negatively impacts the debt ratio. The tax deductibility of amortization and depreciation is a substitute for the debt-tax deductibility. The non-debt tax shield is an alternative funding source for the Algerian companies.

For the state-owned subsample, the debt ratio decreases when the firm size increases. The small state-owned enterprises have low self-financing. These companies are financed by the debt. For the services field subsample, the liquidity is used as collateral.

This research comes with some limitations. First, the dependent variable includes the data about the bank debts and the leasing (detailed data not available). Under the bank credit rationing hypothesis, the leasing can be an alternative to a bank loan. Second, some important determinants (the risk variable, the dividend policy variable) are not used because of the lack of data.

For the practical implication, we can say that our results enhance the knowledge about the capital structure determinants of the non-financial enterprises in Algeria. The results can help the decision makers to manage the capital structure in a proficient way. Further researches can give more understanding about the financial behavior of companies by considering the country-level and industry-level determinants (financial intermediaries development, bank concentration, financial market development, financial freedom, macroeconomic variables). Testing these different factors offers a promising research direction.

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Appendix

Table 1. Previous Algerian empirical studies

Study	Sample	Variables
Toumi Dadene 2014	165 SMEs 83 large companies Period: 2008-2010	Dependent variable: Banking and financial debt to equities Independents variables: Profitability (+ impact) for SMEs Firm growth (+ impact) both large SMEs Debt lagged (+ impact) both large SMEs
Admane Mehar 2013	100 enterprises Period: 2007-2008	Dependents variables: Total debt to total asset Long term debt to total asset Short term debt to total asset Independents variables: For long term debt ratio: Size (+ impact), activity area (+ impact) Tangibility (+), Profitability (-)
Chadlia 2017	197 enterprises Period: 2009-2012	Dependent variable: Total debt to equities Independents variables: Operational income (+), investment (+) Profitability (-), age (-)
Guerrache 2015	118 private non-financial enterprises Period: 2005-2008	Dependents variables: Total debt to total asset Long term debt to total asset Independents variables: For long term debt ratio: Tangibility (+), profitability (-) Self-financing capacity (-) Tax reform (-), activity area (-)
Belkacemi 2019	55 private enterprises Period: 2010-2015	Dependents variables: Total debt to total asset Long term debt to total asset Short term debt to total asset Independents variables: For long term debt ratio: Size (+), tangibility (+), profitability (-) Growth (+), activity area (-)
Noui, Ben Trad & Kaddouri 2018	219 SMEs Period: 2013-2016	Dependents variables: Total debt to total asset Independents variables: Size (-), profitability (-), liquidity (-)

Source: author