www.cya.unam.mx/index.php/cya

Contaduría y Administración 64 (1), 2019, 1-29

Contaduría y Administración
Accounting & Management

Empirical evidence on the relationship of capital structure and market value among Mexican publicly listed companies

Evidencia empírica sobre la relación de estructura de capital y valor entre empresas mexicanas listadas en bolsa

María del Rocío Vega Zavala* and Roberto Joaquín Santillán Salgado

Instituto Tecnológico y de Estudios Superiores de Monterrey, México

Received: 13 January 2017; accepted: 16 October 2017.
Available online 5 November 2018.

Abstract

This paper estimates the impact of capital structure changes on the market value of a sample of 69 non-financial firms listed in the Mexican Stock Exchange, during the period 2004 to 2014. Using Pooled Ordinary Least Squares (OLS), Fixed Effects (FE) and Random Effects (RE) regressions, we confirm the extensively documented positive influence of leverage on firm value; i.e. there is a clearly positive and statistically significant relationship between changes in financial leverage (debt ratios and debt to invested capital) and changes in Tobin's Q (our proxy variable for firm value). When the sample is distributed in sub samples of firms with low and high leverage, small and big size, low and high profitability, or low and high risk, the financial leverage coefficients vary in magnitude and, in the case of debt ratios, remain highly significant. Our main contribution consists in the analysis of the estimated parameters, contributing to a better understanding of the impact of financial leverage changes on the value of different types of firms. These findings have important implications for corporate financial strategies, as well as for portfolio managers' investment choices.

JEL codes: G3, G31, G32
Keywords: Value of firms; Leverage; Size; Mexican Stock Market.

* Corresponding author.
E-mail address: rvega@itesm.mx (M.R. Vega Zavala)
Peer review under the responsibility of Universidad Nacional Autónoma de México.

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

Resumen

Este artículo estudia el impacto de cambios en la estructura de capital sobre el valor de mercado de una muestra de 69 corporaciones no financieras listadas en la Bolsa Mexicana de Valores durante el periodo 2004 a 2014. Utilizando regresiones con Mínimos Cuadrados Ordinarios (OLS) en "Pool", Efectos Fijos y Efectos Aleatorios, confirmamos la ampliamente documentada relación entre el apalancamiento financiero y el valor de la empresa; i.e., existe una relación claramente positiva y estadísticamente significativa entre cambios en la palanca financiera (razón de endeudamiento y razón de deuda a capital invertido) y cambios en la Q de Tobin. Cuando la muestra completa se divide en submuestras de empresas con bajo y alto apalancamiento, pequeño y gran tamaño, baja y alta rentabilidad, o bajo y alto riesgo, los coeficientes varían en magnitud y, en el caso de la razón de endeudamiento, todos conservan su elevada significancia. Nuestra principal contribución consiste en el análisis de los parámetros estimados, contribuyendo a una mejor comprensión del impacto de cambios en apalancamiento financiero sobre distintos tipos de empresas. Estos hallazgos tienen importantes implicaciones para la estrategia financiera de la corporación y para la decisión de qué tipo de activos incluir en los portafolios de inversión.

Códigos JEL: G3, G31, G32
Palabras clave: Valuación de empresas, Apalancamiento, Tamaño, Bolsa Mexicana de Valores

Introduction

The capital structure choice is one of the most important strategic decisions made by managers, because of its wide implications for corporate performance and firm value. The influence of financial leverage on the economic value of the firm has been extensively studied, since the path-breaking work of Modigliani & Miller (1958) on the Irrelevance of Capital Structure. Ever since, a large number of empirical studies have tested MM's Irrelevance of Capital Structure Theory in different social, economic and geographical settings, and in different time frames.

As a follow-up of their original contribution, Modigliani & Miller (1963) discuss a slightly different model in which they recognize the way corporate tax-shields may increase the value of a firm, as it increases its use of debt. The new model relaxes the original assumptions of a world with "no taxes", perfect information and free from other frictions, and recognizes that the fiscal benefit of using debt is significantly larger than what they had originally anticipated. The main implication is that arbitrage opportunities will make the market value of firms within the same class to be a function not only of their expected returns, but also of the prevailing corporate tax rate and the firm's debt level. MM clarify that their conclusion does not imply that firms should seek to use unlimited debt, and recommend managers to carefully ponder all other real-world costs associated to financial strategy. Later work proved that one of the most important of those real-world costs of using excessive debt is the risk of bankruptcy, reconciling the empirically observed use of debt, with the predictions of Modigliani & Miller's analysis (see, for example, Senbet, & Seward, 1995, for a detailed survey on the subject).

During the early 1970's there was relative consensus that an "optimal capital structure" must achieve a balance between the tax shield of debt, and the cost of financial distress. However, towards the end of that decade, Miller (1977) again raised the stakes by demonstrating that the fiscal advantage of corporate tax-shields could be completely offset by the effects of personal taxes.

A large number of studies have focused on the identification of the determinants of a firm's capital structure. Some of the possible influential variables include, for example, the tangibility of the firm's assets, the relative stability of cash flows, the intensity of competition, among others. Many of those studies have found confirmatory empirical evidence[1].

In contrast, research on the influence of capital structure on a firm's value shows only mixed results. Some works support Modigliani & Miller's (1958) "irrelevance" of capital structure argument, while others find a positive relationship between leverage and firm value, as suggested by Modigliani & Miller (1963), and, still others report a negative relation between capital structure and firm value (e.g., Zingales & Rajan 1995). Although market imperfections (such as taxes, agency costs and asymmetric information) have been frequently cited to explain why capital structure is an important determinant of firm value, the nature of the relationship has not yet been completely clarified, and remains a subject of active discussions (Myers 1993, 2001).

It is important to mention that most of the published studies on the subject have been produced using data from the more advanced countries, where financial markets are deeper and more liquid, making emerging countries a special case that deserves more attention. The intention of this study is to contribute to a better understanding of the relationship between leverage changes and firms' valuation in Mexico, an emerging economy.

By studying a sample of publicly traded Mexican non-financial firms, we find a positive and significant relationship between changes in different measures of leverage and changes in Tobin's Q, used as a proxy for firm value. This is an already extensively documented stylized phenomenon; however, the original contribution that we introduce is on the way different characteristics of the firm affect the response of firms' value to leverage, as discussed in more detail in the following sections.

The next section presents a brief literature review on the influence of debt utilization over firm value; the third section introduces the sample data, the econometric approach, and the results interpretation. The fourth section concludes, summarizes the findings, and suggests future research avenues.

Literature review

Modigliani & Miller (1958, 1963) established the theoretical framework that for decades has explained how does the use of debt impact a firm's value. Since that seminal work, many other authors have contributed to develop the theory and to the empirical testing of its conceptual proposals. For example, the works of Stiglitz (1969 and 1988) offer evidence that capital structure is relevant for the determination of firm value, argues that the assumptions of Modigliani & Miller (1958) are not realistic, and suggest that capital structure affects firm value because of the different tax-rates paid on debt and equity income. Or, Leland & Pyle (1977) and Ross (1977), who suggest that firms use the announcements of capital structure changes to signal the quality of their future projects and, when market participants interpret those signals, they buy/sell stock, affecting the value of the firm.

De Angelo & Masulis (1980) implicitly recognize the influence of leverage on the value of the firm when they propose that the optimal capital structure is determined at the point where the marginal tax advantages of debt is equal to the marginal costs of financial distress, thus maximizing the market value of the firm.

[1] See Grinblatt & Titman 2002, Chapter 17, for a detailed discussion on this topic.

Masulis (1983) was among the first to estimate the impact of a change in debt levels on firm value, and studies two forms of capital structure change: issuer exchange offers, and recapitalizations. The evidence reported confirms the existence of a positive relationship among firms' value and leverage changes, which is consistent with optimal capital structure models, as well as with the idea that changes in debt levels convey information on firms' value.

In one of the most influential works in the field Myers & Majluf (1984) show that if new investors are less informed than current investors about the quality of a firm, issuing new equity may cause an erosion in firm's value because the market will infer the stock price is overvalued. These authors argue that new equity issues are interpreted by the market as "bad news", so managers always prefer to fund new projects with debt, not with equity, implicitly imposing a positive relation between debt level and firm value.

Again, Fischer et al. (1989) refute Modigliani & Miller's irrelevance proposition suggesting that an optimal dynamic capital structure can be found by considering the tax benefits of debt, bankruptcy costs, asset variability, the riskless interest rate, and the costs of recapitalization. In contrast, Zingales & Rajan (1995) and Frank & Goyal (2002) report a negative relation between the firm's financial leverage and the market to book value ratio.

What can be learned from this rapid overview of the literature is that while some seminal authors associate greater financial leverage to higher firm value, others find an opposite relation between those variables, and still others find no relation at all. But, only in the "perfect" world of Modigliani and Miller (1958) is the value of the firm totally neutral to capital structure changes, so the latter case may be attributed to measurement bias or model definition issues.

In the context of emerging economies, there are again three different categories of empirical results. A number of studies find a negative relationship between debt utilization and firm value (e.g. Phung & Le 2013; Ivashkovskaya & Stepanova 2011; Ruan, Tian & Shiguang 2011; and, Tian & Zeitun 2007). Others find a positive relationship among emerging markets firms (e,g Mansourlakoraj 2015; Priya et al. 2015; Javeed & Azeem 2014; Olokoyo 2013; Chowdhury & Chowdhury 2010; and, Sarma & Rao 1969). And, still some others agree with the original Modigliani & Miller's (1958), reporting that leverage does not have a statistically significant relationship with firm value (e.g. Hasan, Ahsan, Rajhans & Kaur 2014; Naceur, Ben & Goaied 2002; and, Krishnan & Moyer 1997).

Finally, some studies report mixed results. That seeming contradiction of terms may be explained either because of different measures of the value of the firm and/or its capital structure, or because there is a threshold on leverage's influence on firm value. Some interesting examples include Jawad et al. (2015), Cheng & Tzeng (2014), Sheikh & Wang (2013), Lin & Chang (2011) and Iturriaga & Crisostomo (2010). A more comprehensive overview of these works is included in Table A1 in the Appendix.

Data, methodology and econometric results

By the end of 2014, 149 firms were listed in the Mexican Stock Exchange Market. Financial sector firms are excluded from our sample due to the peculiarities of their capital structure[2], leaving only 88 non-financial public firms. The sample is further reduced because only those firms whose financial statements and stock price are complete for the 2004 to 2014 period

[2] In commercial banks and other financial institutions, capital structure decisions are guided by regulatory constrains and a different set of principles than in the rest of the economy.

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

are included, leaving a final sample of 69 firms. The financial statements of those firms are retrieved from Capital IQ, and their stock prices, from Bloomberg. Almost 90% of the firms in our sample are part of the sectorial indices of the Mexican Stock Exchange. A complete list of the firms and some of their characteristics is included in Table A2 in the Appendix.

The variable of interest is the value of the firm, as proxied with Tobin's Q. It is modeled using a set of explanatory variables that include financial leverage (extensively documented in the relevant literature as one of the main influences of firms' valuation) and three additional control variables: size, profitability and risk. Understanding the relationship of changes in the independent variables (leverage, size, profitability and risk) with changes on the dependent variable (value of the firm) reveals interesting stylized facts of interest to different economic agents.

The dependent variable, , Value of the firm for time is measured with Tobin's Q[3], as follows:

$$\text{Tobin's Q} = \frac{\text{Market value of equity + Book value of debt}}{\text{Book value of Assets}} \quad (1)$$

Financial leverage is measured using three different ratios: (i) the debt ratio[4]

$$\text{Leverage1} = \text{Debt} / \text{Assets}. \quad (2)$$

(ii) following Tian & Zeitun (2007) and others, Debt to invested capital:

$$\text{Leverage2} = \text{Debt} / (\text{Debt} + \text{Equity}) \quad (3)$$

(iii) according to Modigliani & Miller (1958), Stiglitz (1988) and many others, the third measure of leverage is Debt to equity:

$$\text{Leverage3} = \text{Debt} / \text{Equity} \quad (4)$$

As mentioned, the results reported by numerous studies on the relationship between leverage and firm value are not conclusive.

Working Hypotheses

We postulate that leverage may generate increases in firm value due to debt's relatively lower cost, but beyond a certain point, the cost of leverage increases as a result of potential bankruptcy costs, resulting in a negative impact on firm value. Our first working hypothesis is expressed as follows:

Hypothesis No. 1: Changes in Leverage have a positive relationship with changes in firm value for low leverage firms, and a negative relationship for high leverage firms.

[3] Tobin's Q ratio has been used to measure firms' value in numerous studies (e.g., Hasan, Ahsan, Rahaman, & Alam, 2014; Ivashkovskaya & Stepanova, 2011; Javeed & Azeem, 2014; Jawad, Shahzad, Ali, Ahmad & Ali, 2015.; Lin & Chang, 2011; Mansourlakoraj, 2015; Olokoyo, 2013; Phung & Le, 2013; Ruan, Tian & Shiguang, 2011; Kouki & Said, 2011; Tian & Zeitun, 2007). Tobin' Q mixes market values with accounting values, and reflects the market expectations about the future efficiency of strategic decisions.

[4] This measure of financial leverage has been used in many studies. Some of them are : Zingales & Rajan, 1995; DeAngelo & Roll, 2015; Sarma & Rao, 1969; Kouki & Said, 2011; Cuong, 2016; Carpentier, 2006, and in 16 out of the 18 studies in emerging markets mentioned in Table A1.

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

In this study, the size of a firm is measured as the Log of Total Assets. Mixed results have been found with respect to the relationship between this variable and a firm's value. According to some authors, there is a positive relationship as a result of the economies of scale enjoyed by large firms (e.g. Sheikh & Wang 2013; Tian & Zeitun 2007). Larger firms have more reputation, lower bankruptcy risk, lower information costs and less problems of information asymmetry; consequently, they also have higher value (Chen & Chen 2011).

Alternatively, a negative relationship may result due to the inefficiencies from the size of large firms, or diseconomies of scale (Jawad et al. 2015; Kouki & Said, 2011; Wippern, 1966). In the same way, Chaudhry & Sam (2014) found a negative relationship between firm size and stock returns. To test if that is the case in our sample firms, we postulate the following hypothesis:

Hypothesis No. 2: Changes in Size have a negative relationship with changes in firm value.

Profitability is measured in two ways: i) As in Friend & Lang (1988), Booth (2001) and Zingales & Rajan (1995), among others, the first measure of profitability is Return on Assets (ROA), calculated as EBIT/Assets. ii) According to Krishnan & Moyer (1997), the second measure of profitability is the return on invested capital, ROIC, defined as EBIT minus taxes divided by the sum of debt plus equity. A positive relationship between this variable and Firm Value is expected *a priori* (Kouki & Said, 2011). Likewise, Chen & Chen (2011) found the greater the profitability of a firm, the more the assignable profit, and the higher the value of the firm. Kurniasari & Warastuti (2015), Yang et al. (2010), Haugen & Baker (1996), Varaiya, Kerin & Weeks (1987) also found a positive relationship between profitability and firm value. In this study we test:

Hypothesis No. 3: Changes in Profitability have a positive relationship with changes in firm value.

According to Krishnan & Moyer (1997), risk is conceptualized as the variability of profits. In this study, it is operationalized as the Log of the standard deviation of EBITDA during the previous five years.

Different theories explain the relation between firm value and risk. For example, Modigliani & Miller (1958) postulate that, in perfect markets, the firm's value is independent from risk. Empirical evidence has shown that the perfect market hypothesis does not hold, and that risk can lead to deadweight costs (Nocco & Stulz 2006). The agency theory postulates there is a positive relationship that results from risk-averse behavior (Ross 1973). This theory is supported by several empirical works (e.g., Fletcher 2000; Maurer 2008) that find a positive relationship between beta (CAPM) as a measure of risk, and stock returns which, eventually, make stocks more valuable. Similarly, Abdel-azim (2015) found a positive relationship between risk, measured by beta (CAPM), and Tobin's Q, used as a proxy for firm value. By contrast, there are several empirical works that have found a negative relationship between risk and return. For example, Bowman's paradox states that decision makers are risk-seeking and assume higher risk for lower return (Bowman, 1982). Bowman's paradox was confirmed by other empirical works (e.g., Fama and French, 1992; Andersen et al., 2007). We test for risk's influence on firm value with Hypothesis No. 4:

Hypothesis No. 4: Changes in Risk have a negative effect on changes in firm value.

Methodological Design

Following Alonso *et al*. (2005) the median value of the distribution of each explanatory variable is utilized to subdivide the sample in two groups:

a) Low and high leverage: With median values of 47.4% for the debt ratio, 30.4% for debt to invested capital and 45.2% for the debt to equity ratio.
b) Small and big size: With a median of Log of Assets of 3.04.
c) Low and high profitability: ROA with median value of 4.7% and ROIC, with median of 6.51%.
d) Low and high risk: The median value for the log of the standard deviation of EBITDA is 1.44.

All firms with lower values than the corresponding median, conformed the samples of "low" levels, the rest of the firms were included in the samples of "high" levels. Low levels in all subsamples consisted of 34 firms and the high levels included 35 firms.

Given the characteristics of the sample (short period of observations and large number of entities), the recommended econometric approach is Panel Data Analysis, including Pooled Ordinary Least Squares (OLS), Fixed Effects (FE) and Random Effects (RE). Our interest lies in the measurement of changes in firms' value (as measured by first-differences in Tobin's Q), with respect to the explanatory variables (also in first-differences). The basic model is expressed as follows:

$$dV_{it} = \alpha + \beta_1 dLEVER + \beta_2 dSIZE + \beta_3 dPROFIT + \beta_4 dRISK + \varepsilon_{it} \qquad (5)$$

Where:
dV_{it}: Change in Value of the *i* firm for time *t*
α = Intercept or the firm-varying linear coefficient
dLEVER: Change in Leverage
dSIZE: Change in Size
dPROFIT: Change in Profitability
dRISK: Change in Risk
$\beta_1, \beta_2, \beta_3, \beta_4$ =Angular coefficients to be estimated
ε_{it} = Disturbance term or residual

With $i = 1, \ldots, N$, the number of firms; $t = 1, \ldots, T$, the time periods, *and* ε_{it}, the error term, expected to be normally distributed with zero mean and constant variance:

$$\varepsilon_{it} \cong iid\ N\ (0, \sigma^2 \varepsilon).$$

The model yields unbiased and efficient estimates of the parameters, since it minimizes the loss of degrees of freedom. The panel data approach allows for the control of the "unobservable constant heterogeneity" (Arellano & Bover 1990) to control for variables that cannot be measured or directly observed (like organizational culture factors or differences in business practices across firms) and for variables that change over time but not across firms (i.e. national policies, federal regulations, international agreements, etc.). Furthermore, the dynamic

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

dimension of panel data supports testing long time adjustment processes that determine the sensitivity of firm value to the explanatory variables changes (Alonso et al., 2005).

From the basic model we test three specific variations for each of the nine samples (considering the different measures of leverage and profitability):

Model 1:

$$dV_{it} = \alpha + \beta_1 dLEVER1 + \beta_2 dSIZE + \beta_3 dPROFIT1 + \beta_4 dRISK + \varepsilon_{it}$$

Where:
*dLEVER*1: Change in Leverage defined as D/A
*dPROFIT*1: Change in Profitability defined as ROA

Model 2:

$$dV_{it} = \alpha + \beta_1 dLEVER2 + \beta_2 dSIZE + \beta_3 dPROFIT2 + \beta_4 dRISK + \varepsilon_{it}$$

Where:
dLEVER2: Change in Leverage defined as D/(D+E)
dPROFIT2: Change in Profitability defined as ROIC

Model 3:

$$dV_{it} = \alpha + \beta_1 dLEVER3 + \beta_2 dSIZE + \beta_3 dPROFIT2 + \beta_4 dRISK + \varepsilon_{it}$$

Where:
dLEVER3: Change in Leverage defined as D/E
dPROFIT2: Change in Profitability defined as ROIC

Table A3 in the Appendix contains the descriptive statistics of all the variables. It is interesting to notice that dV_{it} has a mean of around -0.12 in most sub-samples meaning that, on average, Mexican non-financial public firms value decreased 12 percentage points annually during 2004-2014.

The three measures of leverage indicate that the sample of Mexican Public firms did not have important changes in capital structure on average, during the period of observation, i.e., the average change in the three measures was very close to zero.

The Change in the Size of Firms suggests that the average firm in the sample increased in size by around 2% annually.

The two measures of Profitability reveal that, during the period of 2004-2014, sample firms reduced their profitability between 1% to almost 20% in the different sub-samples. The smallest reduction was for the low leverage sample and the largest was for the high leverage sample. Finally, Risk increased by an average of 1% annually during 2004-2014.

The Panel Analysis model is estimated using Pooled Ordinary Least Squares (OLS), Fixed effects (FE) and Random effects (RE) regressions.

The Pooled model is the most restrictive, since it specifies constant coefficients. If the model is correctly specified and the independent variables are not correlated with the regression error, then it can be consistently estimated using Ordinary Least Squares.

The Fixed Effects Model (FE) considers the unique characteristics of every unit (firm) from cross section data, and captures them with different intercepts for each entity; however, the angular coefficients are constant or fixed across entities. In the Fixed Effects Model, the unobserved variables do not change over time, so it can be assumed that any change in the dependent variable is due to influences other than the fixed characteristics.

The Random Effects Model (RE) assumes that the entity's error term is uncorrelated with the explanatory variables, which allows for time-invariant variables to play a role as independent variables. Using RE it is possible to generalize the inferences beyond the sample used in the model, something that cannot be done with FE.

To choose among the three models: Pooled Ordinary Least Squares, Fixed Effects or Random Effects, two tests are used: (i) the Redundant Fixed Effects Test, to decide between Pooled Ordinary Least Squares and Fixed Effects; and, (ii) the Hausman Test to decide which of the two, Fixed Effects or Random Effects, is more appropriate.

Results and Analysis

We first present the results of the panel regressions for the complete sample under the three models in Table 1, below. Only the best adjustment model is reported in the table; however, a complete report can be obtained upon request.

Table 1
Regression Results: Whole Sample

Dependent Variable:	*dV*		
Model	1	2	3
Leverage	D/A	D/(D+E)	D/E
Profitability	ROA	ROIC	ROIC
Preferred Estimation Method	FE	FE	FE
dLEVER	0.73919	0.2860	0.004488
	(5.815054)***	(2.677)***	(0.598405)
dSIZE	-2.991714	-3.344	-3.297504
	(-22.35449)***	(-20.563)***	(-20.28778)***
dPROFIT	0.008323	0.0013	0.001382
	(2.321158)**	(1.8703)*	(2.060812)**
dRISK	-0.171891	-0.1322	-0.120659
	(-2.714313)***	(-1.81432)*	(-1.65043)*
CONS	-0.026838	-0.0355	-0.035736
	(-2.63327)***	(0.0041)***	(-2.88835)***

Source: Own elaboration with data retrieved from Capital IQ and panel regressions in Eviews.
Note: *dV*: Change in firms' Value, measured with Tobin's Q. *dLEVER*: Change in Leverage (three measures). *dSIZE*: Change in the Size of the firm. *dPROFIT*: Change in Profitability (two measures). *dRISK*: Change in Risk. *** = Significant at a 1% level; ** = Significant at a 5% level and * = Significant at a 10% level. Numbers in parentheses are asymptotic t-values.

The relationship between changes in leverage and changes in firm value in the three models is positive and highly statistically significant in models 1 and 2, but loses significance at conventional levels for model 3. According to model 1, if financial leverage increases by 1%, the Firm Value will increase in 0.739%, consistent with the results reported in several works (e.g. Mansourlakoraj 2015; Priya 2015; Javeed & Azeem 2014; Olokoyo, 2013; Chowdhury & Chowdhury 2010; Masulis 1983; Ruland & Zhou 2005; Sarma & Rao 1969; and Wippern 1966). Changes in size also have a negative and statistically significant coefficient for the three models, confirming the theory that, as size increases, the firm experiences inefficiencies (diseconomies of scale) that will cause its value to diminish. The results also indicate that there is a very small positive, but significant relationship between changes in profitability and changes in the value of the firm. Likewise, there is a significant negative relationship between risk and firm value in all three models.

The results for the two sub-samples that are classified according to the level of financial leverage, i.e., low and high leverage firms, are presented in Table 2.

Table 2
Subsample Regression Results: Low Leverage vs High Leverage Firms

	Dependent Variable: *dVit*					
	Low Leverage Firms			High Leverage Firms		
Model	1	2	3	1	2	3
Leverage	D/A	D/(D+E)	D/E	D/A	D/(D+E)	D/E
Profitability	ROA	ROIC	ROIC	ROA	ROIC	ROIC
Pref. Estim. Method	FE	FE	FE	RE	FE	FE
dLEVER	0.8571	0.4771	0.2275	0.7362	0.2294	0.0033
	(5.9723)***	(4.0194)***	(3.6604)***	(3.6587)***	(1.4073)	(0.3442)
dSIZE	-3.3613	-3.4425	-3.4218	-2.8463	-3.3077	-3.2845
	(-23.8193)***	(-22.7593)***	(-22.9346)***	(-12.9793)***	(-12.2728)***	(-12.1046)***
dPROFIT	0.0052	0.0054	0.0050	0.0147	0.0012	0.0013
	(1.7187)*	(2.2977)**	(2.2191)**	(1.8557)*	(1.3497)	(1.5067)
dRISK	-0.1676	-0.1601	-0.1847	-0.1739	-0.1294	-0.0873
	(-2.5502)**	(-2.4594)**	(-2.8566)***	(-1.6557)*	(-1.0249)	(-0.6830)
CONS	-0.0165	-0.0261	-0.0252	-0.0305	-0.0434	-0.0432
	(-1.6463)	(-2.5636)**	(-2.4614)**	(-0.9428)	(0.0517)*	(-1.9420)*

Source: Own elaboration with data retrieved from Capital IQ and panel regressions in Eviews.
Note: *dV*: Change in firms' Value, measured with Tobin's Q. *dLEVER*: Change in Leverage (three measures). *dSIZE*: Change in the Size of the firm. *dPROFIT*: Change in Profitability (two measures). *dRISK*: Change in Risk. *** = Significant at a 1% level; ** = Significant at a 5% level and * = Significant at a 10% level. Numbers in parentheses are asymptotic t-values.

For the three models the relationship between change in leverage and change in firm value remains positive and highly statistically significant among low financial leverage firms; but for high leverage firms that relationship is only significant for model 1. In the case of the control

variables, the relationship with firm value are all statistically significant for low leverage firms, but not so for high leverage firms; only the first model's control variables are statistically significant in all cases.

In the case of models 2 and 3 for high leverage firms, not only does leverage lose statistical significance but, while the coefficients of all the control variables keep the same sign changes in profitability and in risk lose their statistical significance. The change in size shows a negative and statistically high significant relationship with firm value in all the models.

Table 3 reports the estimation results for the sub samples obtained using the size of the firm as the analytical variable:

Table 3
Subsample Regression Results: Small Size vs. Large Size Firms

	Dependent Variable: *dV*					
	Small Size Firms			Large Size Firms		
Model	1	2	3	1	2	3
Leverage	D/A	D/(D+E)	D/E	D/A	D/(D+E)	D/E
Profitability	ROA	ROIC	ROIC	ROA	ROIC	ROIC
Pref. Estim. Method	FE	FE	FE	RE	RE	RE
dLEVER	0.5970	0.3837	0.0144	1.0139	0.1657	0.0024
	(3.1609)***	(2.7758)***	-0.6021	(6.2806)***	(1.0153)	(0.2978)
dSIZE	-2.7233	-2.7747	-2.6903	-3.4289	-4.2985	-4.2782
	(-13.5376)***	(-13.3109)***	(-12.9076)***	(-20.3983)***	(-17.6897)***	(-17.6693)***
dPROFIT	0.0070	0.0044	0.0030	0.0062	0.0010	0.0011
	(1.4366)	(1.2720)	(0.8683)	(1.1173)	(1.4292)	(1.5875)
dRISK	-0.2517	-0.2640	-0.2295	-0.0546	0.0388	0.0393
	(-2.4308)**	(-2.5753)**	(-2.2291)**	(-0.7354)	(0.7013)	(0.3883)
CONS	-0.0361	-0.0462	-0.0476	-0.0102	-0.0073	-0.0071
	(-2.2240)**	(0.0052)***	(-2.8707)***	(-0.5630)	(-0.3051)	(-0.3012)

Source: Own elaboration with data retrieved from Capital IQ and panel regressions in Eviews.
Note: *dV*: Change in firms' Value , measured with Tobin's Q. *dLEVER*: Change in Leverage (three measures). *dSIZE*: Change in the Size of the firm. *dPROFIT*: Change in Profitability (two measures). *dRISK*: Change in Risk. *** = Significant at a 1% level; ** = Significant at a 5% level and * = Significant at a 10% level. Numbers in parentheses are asymptotic t-values.

The relationship between leverage and firm value continues to be positive for small and large firms under the three models, but among the latter it is significant in model 1 only. Change in size and change in firm value have a negative and high statistically significant relationship in the three models, although it is weaker for small firms and stronger for large firms, relative to the complete sample. For both, small and large firms, and for the three models, the relationship between the change in profitability and firm value continues to be positive, but not significant. Regarding the relationship between risk and firm value, it is negative for both, small and large firms, under the three models, but completely loses statistical significance for large firms.

For smaller firms, that relationship is stronger relative to the complete sample, and remains statistically significant for the three models. This means that the negative effect of size on firm value is more intense in smaller firms. Table 4 reports the Low and High Risk sub samples' estimates.

Table 4
Subsample Regression Results: Low Risk vs. High Risk Firms

Dependent Variable: *dV*						
	Low Risk Firms			High Risk Firms		
Model	1	2	3	1	2	3
Leverage	D/A	D/(D+E)	D/E	D/A	D/(D+E)	D/E
Profitability	ROA	ROIC	ROIC	ROA	ROIC	ROIC
Pref. Estim. Method	FE	FE	FE	RE	RE	RE
dLEVER	0.5685	0.3595	0.0115	1.0498	0.2076	0.0029
	(2.9089)***	(2.6290)***	(0.4882)	(6.5431)***	(1.2444)	(0.3594)
dSIZE	-2.8032	-2.8258	-2.7522	-3.2908	-4.1537	-4.1208
	(-13.7703)***	(-13.6589)***	(-13.2981)***	(-20.0433)***	(-17.0356)***	(-16.9704)***
dPROFIT	0.0066	0.0027	0.0007	0.0068	0.0011	0.0012
	(0.8959)	(0.5603)	(0.1499)	(1.8711)*	(1.5697)	(1.7529)*
dRISK	-0.2584	-0.2588	-0.2263	-0.0720	0.0147	0.0132
	(-2.4719)**	(-2.5670)**	(-2.2375)**	(-0.9866)	(0.1424)	(0.1274)
CONS	-0.0337	-0.0430	-0.0445	-0.0156	-0.0157	-0.0156
	(-2.0616)**	(-2.669)***	(-2.7389)***	(-0.8570)	(-0.6498)	(-0.6470)

Source: Own elaboration with data retrieved from Capital IQ and panel regressions in Eviews.
Note: *dV*: Change in firms' Value , measured with Tobin's Q. *dLEVER*: Change in Leverage (three measures). *dSIZE*: Change in the Size of the firm. *dPROFIT*: Change in Profitability (two measures). *dRISK*: Change in Risk. *** = Significant at a 1% level; ** = Significant at a 5% level and * = Significant at a 10% level. Numbers in parentheses are asymptotic t-values.

The relationship between Leverage and Firm Value remains positive but is not statistically significant three of the six models (model 3 of the Low Risk sub sample, and models 2 and 3 of the High Risk sub sample). The negative and highly statistically significant relationship between size and firm value in all six models is less intense among Low Risk firms and stronger among High Risk firms, in comparison to the whole sample. The positive and small size of the coefficients for the relationship between profitability and firm value remains, but loses statistical significance in most cases. A negative sign is preserved in the relationship between risk and firm value, but loses statistical significance for the High Risk sub sample. Finally, Table 5 presents the Low and High Profitability sub samples' results.

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

Table 5
Subsample Regression Results: Low Profitability vs. High Profitability Firms

	Dependent Variable: *dV*					
	Low Profitability			High Profitability		
Model	1	2	3	1	2	3
Leverage	D/A	D/(D+E)	D/E	D/A	D/(D+E)	D/E
Profitability	ROA	ROIC	ROIC	ROA	ROIC	ROIC
Pref. Estim. Method	RE	RE	RE	RE	FE	FE
dLEVER	0.7752	0.4367	0.0054	0.8963	0.2064	0.0140
	(8.0049)***	(5.4371)***	-1.1987	(3.6372)***	(0.9955)	(0.3147)
dSIZE	-2.1776	-2.3734	-2.3277	-4.2078	-4.7005	-4.6476
	(-21.6267)***	(-19.9095)***	(-18.8589)***	(-16.8112)***	(-14.9584)***	(-14.9907)***
dPROFIT	0.0101	0.0026	0.0001	0.0073	0.0010	0.0012
	(2.4999)**	(0.8950)	(0.0295)	(1.4095)	(1.2302)	(1.4112)
dRISK	-0.0571	-0.1324	-0.0905	-0.2429	-0.0976	-0.1026
	(-1.1520)	(-2.2883)**	(-1.5193)	(-2.1200)**	(-0.7564)	(-0.7945)
CONS	-0.0033	-0.0088	-0.0094	-0.0195	-0.0329	-0.0336
	(-0.2368)	(-0.6035)	(-0.6420)	(-0.6418)	(-1.4243)	(-1.4497)

Source: Own elaboration with data retrieved from Capital IQ and panel regressions in Eviews.
Note: *dV*: Change in firms' Value , measured with Tobin's Q. *dLEVER*: Change in Leverage (three measures). *dSIZE*: Change in the Size of the firm. *dPROFIT*: Change in Profitability (two measures). *dRISK*: Change in Risk. *** = Significant at a 1% level; ** = Significant at a 5% level and * = Significant at a 10% level. Numbers in parentheses are asymptotic t-values.

In this case, the sign of the coefficient for change in Leverage is positive in all six models, but only significant in Low Profitability firms' models 1 and 2, and in model 1 of the High Profitability sub sample. Changes in Size are highly statistically significant and have a negative sign in all six models, but the magnitude of the Low Profitability models is about half the size of the High Profitability models, i.e., as High Profitability firms grow in size, the market penalizes possible diseconomies of scale twice as much than in the case of Low Profitability firms. The relation between changes in Profit and changes in Risk, versus Firm Value is not significant in most of the regressions, but in all cases preserves the signs of the whole sample.

Our results are fully consistent with the Trade-Off Theory, and imply that managers can find an optimal capital structure (one that maximizes firm value), as long as the advantages of using debt (greater tax shield and lower agency costs) are more than the costs of debt (cost of issuing, bankruptcy costs, and agency costs of debt). Accordingly, firm value may be augmented by increasing leverage until the marginal benefits from additional debt are equal to the marginal costs of the firm's bankruptcy costs.

All the models suggest the presence of a significant positive relationship between changes in leverage and changes in value. However, the only model that is highly statistically significant in all cases is model 1, which uses the debt ratio to measure leverage. Model 2, with the ratio of debt to invested capital as a measure of leverage, loses statistical significance for all low-debt subsamples. In the case of model 3, using the debt to equity ratio as a proxy for leverage, most of the explanatory variables lose their statistical significance except for Size, which was the variable with the highest and most consistent statistical significance in all of the models and samples. Since in model 1 (which uses D/A as a measure for Leverage) the Leverage coefficient has a positive sign and a high statistical significance for the whole sample, for all the sub samples, and, at the same time, shows statistical significance for the coefficients for most other explanatory variables, our conclusions in the following section refer to it.

Conclusions

This paper tests the effects of changes in leverage on the market value of Mexican publicly traded firms using three econometric estimation methods on the whole sample and eight different sub samples. Our results reject the "Irrelevance Theory" of Modigliani & Miller (1958) and indicate that capital structure changes certainly affect the market value of our sample firms; however, they are fully consistent with Modigliani & Miller (1963). They are also congruent with DeAngelo & Masulis (1980), who suggest there is an "optimal capital structure" since in our estimation's positive relation between leverage and firm value proves to be stronger among firms with low levels of leverage, while the positive effect of leverage is weaker for firms that show high levels of financial leverage; i.e., there seems to be a threshold beyond which leverage no longer increases firm value, suggesting the existence of an optimal capital structure.

Our empirical evidence also supports Myers & Majluf (1984) who postulate that, due to information asymmetries, seasoned equity offers (SEOs) tend to be underpriced, as the market perceives new issues of equity as a proxy indicator of "bad news", so the use of more equity as a proportion of total funds depresses the stock price. In an emerging market environment, the asymmetry of information between managers and new investors is even more serious than in more developed markets, so one should see an even more unfavorable valuation of firms that prefer equity to debt financing. That seems to be the case for our Mexican firms sample.

Segmenting by size, estimation results indicate the relationship between changes in Leverage and Firm Value is weaker among Small Size firms, and stronger among Large Size firms. Segmenting by Profitability yields similar results, the value (proxied by Tobin's Q) of Low Profitability firms is less affected by Leverage than is the case for High Profitability firms.

The main findings of this work are summarized as follows:

1) In general, changes in leverage have a positive effect on firm value for both, low and high leverage firms, although the benefits are greater for low leveraged firms, confirming *Hypothesis No. 1*. We find no evidence that suggests that the use of leverage decreases the value of firms. These results are consistent with the findings of: Sarma & Rao (1969), Javeed & Azeem (2014), and Priya & Protheepan (2015). At the same time, they contradict the findings reported for emerging markets in: Tian & Zeitun (2007), Phung & Le (2013) and Ruan, et al. (2011), and may be attributed to the tax shield associated with leverage, as well as the lower cost of capital from debt.

2) For all nine samples our results indicate that size has a negative impact on relative firm value (as measured by Tobin's Q), confirming *Hypothesis 2*. This negative relationship is stronger for big firms. These findings are similar to those reported in Jawad et al (2015), but contradict the findings of Sheik & Wang (2013) and Tian & Zeitun (2007). We interpret this finding as an expression of diseconomies of scale reflected on market valuation.
3) Changes in profitability have a positive effect on firm value. However, the profitability coefficient was the lowest among all the estimated coefficients in all nine sub samples. Therefore, we conclude that, in the case of Mexican Public firms, the effect of profitability on firm value is positive but not strong, i.e., *Hypothesis 3* cannot be rejected. Loncan & Caldeira (2014) similarly report a positive effect of profitability on firm value among Brazilian firms. It could be argued that the accounting measure of profitability is not the preferred measure of value creation of a firm among Latin American investors.
4) Changes in risk have a negative influence on changes in the firm value of Mexican non-financial public firms, confirming our *Hypothesis 4*. Lin & Cheng (2011) had the same results in a study on Taiwanese firms.

Accordingly, our reported evidence suggests that leverage positively influences firm value, and the "decreasing improvements" in value as debt levels increase could suggest an optimal capital structure, providing evidence that supports the models of Cheng & Tzeng (2014), Kim (1978) and Stiglitz (1972).

These finding have relevant implications for policymakers, academicians and practitioners. For policymakers, it shows the importance of promoting the development of an efficient capital market, and of the transparency of corporate financial laws that make the cost of bankruptcy an important issue to consider when making capital structure decisions. For academicians, this study's results shed light on the different effects of leverage for different types of firms, and also on the importance of capital structure decisions in emerging markets. For practitioners, our results may be of help to make better capital structure decisions considering the fundamental characteristics of their firms and, finally, for investors, the relationship between leverage and other characteristics of firms can help portfolio managers optimize their selection of investment assets.

References

Abdel-azim, M. H. (2015). Risk Management and Disclosure and Their Impact on Firm Value : the Case of Egypt, *9*(1), 30–44.

Alonso, P., Iturriaga, F.J. & Sanz, J.A. (2005). Financial decisions and growth opportunities: A Spanish firm's panel data analysis. *Applied Financial Economics, 15*(6), 391-407. https://doi.org/10.1080/09603100500039201

Andersen, T.J., Denrell, J. & Bettis, R.A. (2007), Strategic responsiveness and Bowman's risk return paradox. Strategic Management Journal, 28, 407-429. https://doi.org/10.1002/smj.596

Arellano, M. & Bover, O. (1990). La econometría de datos panel. *Investigaciones económicas (Segunda Epoca)*, 14(1), 3-45.

Booth, L., Aivazian, V., Demirguc-Kunt, A. & Maksimovic, V. (2001). Capital structure in developing countries, *Journal of Finance*, 56, pp. 87-130.Bowman, E.H. (1980). A risk–return paradox for strategic management. *Sloan Management Review, 21*, 17–31. https://doi.org/10.1111/0022-1082.00320

Bowman, E.H. (1982), Risk seeking by troubled firms. *Sloan Management Review, 23*, 33– 43.

Carpentier, C. (2006). The valuation effects of long-term changes in capital structure. *International Journal of Managerial Finance*, *2*(1), 4-18. https://doi.org/10.1108/17439130610646144

Cuong, N. T. (2016). Threshold effect of capital structure on firm value: Evidence from seafood processing enterprises in the South Central region of Vietnam. *International Journal of Finance & Banking Studies (2147-4486)*, *3*(3), 14-29. https://doi.org/10.20525/.v3i3.186

Chaudhry, M. I., & Sam, A. G. (2014). The information content of accounting earnings, book values, losses and firm size *vis-à-vis* stocks: empirical evidence from an emerging stock market. *Applied Financial Economics*, *24*(23), 1515–1527. https://doi.org/10.1080/09603107.2014.925074

Chen, L. J., & Chen, S. Y. (2011). The influence of profitability on firm value with capital structure as the mediator and firm size and industry as moderators. *Investment Management and Financial Innovations*, *8*(3), 121–129.

Cheng, M.-C., & Tzeng, Z.-C. (2014). Effect of leverage on firm market value and how contextual variables influence this relationship. *Review of Pacific Basin Financial Markets and Policies*, *17*(1), 1450004. https://doi.org/10.1142/s0219091514500040

Chowdhury, A., & Chowdhury, S. (2010). Impact of capital structure on firm's value: Evidence from Bangladesh. *Business and Economic Horizons*, *3*(3), 111–122. https://doi.org/10.15208/beh.2010.32

De Angelo, H. & Masulis, R. (1980). Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics*. *8*(1), 3-29. https://doi.org/10.1016/0304-405x(80)90019-7

DeAngelo, H., & Roll, R. (2015). How stable are corporate capital structures?. *The Journal of Finance*, *70*(1), 373-418. https://doi.org/10.1111/jofi.12163

Fama E.F., & French, K.R. (1992). The cross-section of expected stock returns. *The Journal of Finance, 47*(2), 427–465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x

Fletcher, J. (2000). On the conditional relationship between beta and return in international stock returns. *International Review of Financial Analysis, 9*(3), 235–245. https://doi.org/10.1016/s1057-5219(00)00030-2

Fischer, E., Heinkel, R. & Zechner, J. (1989). Dynamic capital structure choices: Theory and Tests. *Journal of Finance*, *44*(1), 19–40. https://doi.org/10.2307/2328273

Frank, M. & Goyal, V. (2002). Testing the pecking order of capital structure. *Journal of Financial Economics*. *67*(2), 217-248. ttps://doi.org/10.2139/ssrn.243138

Friend, I. & Lang, A. (1988). An Empirical Test of the Impact of Managerial Self-interest on Corporate Capital Structure, *Journal of Finance*, 43 (2), pp. 271-281. https://doi.org/10.2307/2328459

Grinblatt, M. & Titman, S. (2002). Financial Markets and Corporate Strategy. McGraw-Hill, Second Edition.

Hasan, M. B., Ahsan, A. F. M. M., Rahaman, M. A., & Alam, M. N. (2014). Influence of Capital Structure on Firm Performance: Evidence from Bangladesh. *International Journal of Business and Management*, *9*(5), 184–194. https://doi.org/10.5539/ijbm.v9n5p184

Haugen, R.A. & Baker, N.L. (1996). Commonality in the determinants of expected stock returns. *Journal of Financial Economics, 41*,401-439. https://doi.org/10.1016/0304-405x(95)00868-f

Iturriaga, F. J. L., & Crisóstomo, V. L. (2010). Do Leverage, Dividend Payout, and Ownership Concentration Influence Firms' Value Creation? An Analysis of Brazilian Firms. *Emerging Markets Finance and Trade*, *46*(3), 80–94. https://doi.org/10.2753/ree1540-496x460306

Ivashkovskaya, I., & Stepanova, A. (2011). Does strategic corporate performance depend on corporate financial architecture? Empirical study of European, Russian and other emerging market's firms. *Journal of Management and Governance*, *15*(4), 603–616. https://doi.org/10.1007/s10997-010-9132-7

Javeed, A., & Azeem, M. (2014). Interrelationship among capital structure, corporate governance measures and firm value : Panel study from Pakistan. *Pakistan Journal of Commerce and Social Science*, *8*(3), 572–589.

Jawad, S., Shahzad, H., Ali, P., Ahmad, T., & Ali, S. (2015). Financial leverage and corporate performance : Does financial crisis owe an explanation? *Pakistan Journal of Statistics and Operation Research, 11*(1),67-90. https://doi.org/10.18187/pjsor.v11i1.781

Kim, E.H. (1978). A mean-variance theory of optimal capital structure and corporate debt capacity. *Journal of Finance, 33*, 45–64. https://doi.org/10.2307/2326349

Kouki, M. & Said, H. B. (2011). Does management ownership explain the effect of leverage on firm value? An analysis of French listed firms.*Journal of Business Studies Quarterly*, *3*(1), 169–186.

Krishnan, V. & Moyer, R. (1997). Performance, capital structure and home country: An analysis of Asian corporations. *Global Finance Journal, 8*(1), 129-143. https://doi.org/10.1016/s1044-0283(97)90010-7

Kurniasari, W., & Warastuti, Y. (2015). The relationship between CSR and profitability to firm value in Sri-Kehati Index. *Journal of Economic Behaviour*, *5*, 3–14.

Leland, H., & D. Pyle. (1977). Information asymmetries, financial structure, and financial intermediation. *Journal of Finance, 32*, 371-388. https://doi.org/10.2307/2326770

Lin, F.-L., & Chang, T. (2011). Does debt affect firm value in Taiwan? A panel threshold regression analysis. *Applied Economics*, *43*(1), 117–128. https://doi.org/10.1080/00036840802360310

Loncan, T. R., & Caldeira, J. F. (2014). Capital structure, cash holdings and firm value: a study of brazilian listed firms. *Revista Contabilidade & Finanças*, *25*(64), 46-59. https://doi.org/10.2139/ssrn.2329346

Mansourlakoraj, R. (2015). Free cash flow, capital structure and the value of listed firms in Tehran Stock Exchange. *International Journal of Management, Accounting and Economics, 2*(2), 144–149.

Masulis, R. W. (1983). The impact of capital structure change on firm value: Some estimates. *Journal of Finance*, *38*(1), 107–126. https://doi.org/10.2307/2327641

Maurer, F. (2011). Risk and return: New insights for theory, measurement and management. *Journal of Applied Business Research, 24*(4), 51-64. https://doi.org/10.19030/jabr.v24i4.1330

Miller, M. (1977). Debt and taxes. *Journal of Finance, 32*, 261-276. https://doi.org/10.2307/2326758

Modigliani, F. & M. Miller. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, *53*(3), 433–443.

Myers, S.C. (1993). Still searching for optimal capital structure. *Journal of Applied Corporate Finance, 6* (1), 4-14. https://doi.org/10.1111/j.1745-6622.1993.tb00369.x

Myers, S.C. (2001). Capital structure. *Journal of Economic Perspectives, 15* (2), 81-102.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405x(84)90023-0

Naceur, S. B., & Goaied, M. (2002). The relationship between dividend policy, financial structure, profitability and firm value. *Applied Financial Economics*, *12*, 843–849. https://doi.org/10.1080/09603100110049457

Nocco, B., & Stulz, R. (2006). Enterprise risk management: Theory and practice. *Journal of Applied Corporate Finance, 18*(4), 8-20. https://doi.org/10.2139/ssrn.921402

Olokoyo, F.O. (2013). Capital structure and corporate performance of Nigerian quoted firms: A panel data approach. *African Development Review,. 25*(3), 358-369. https://doi.org/10.1111/j.1467-8268.2013.12034.x

Phung, D. N., & Le, T. P. V. (2013). Foreign ownership, capital structure and firm performance: Empirical evidence from Vietnamese listed firms. *IUP Journal of Corporate Governance, 12*(2), 40–59. https://doi.org/10.2139/ssrn.2196228

Priya, K., Balasundaram, N., & Pratheepan, T. (2015). Impact of capital structure on the firm value: Case study of listed manufacturing firms in Sri Lanka. *Scholars World-IRMJCR, 3*(1), 47–53.

Rajhans, R. K., & Kaur, K. (2013). Financial determinants of firm's value: Evidence from Indian Firms. *International Journal of Business Economics and Management Research*,*3*(5), 70–76.

Ross, S. A. (1973). The economic theory of agency: The principal's problem. *American Economic Review, 2*(63),134-139.

Ross, S. A. (1977). The determination of financial structure: The incentive -signalling approach. *The Bell Journal of Economics, 8*(1), 23-40. https://doi.org/10.2307/3003485

Ruan, W., Tian, G., & Shiguang, M. (2011). Managerial ownership, capital structure and firm value: Evidence from China's civilian-run firms. *Australasian Accounting Business and Finance Journal*, *5*(3), 73–92.

Ruland, W., & Zhou, P. (2005). Debt, diversification, and valuation. *Review of Quantitative Finance & Accounting*, *25*(3), 277–291. https://doi.org/10.1007/s11156-005-4768-0

Sarma, L. V. L. N., & Rao, K. S. H. (1969). Leverage and the value of the firm. *Journal of Finance*, *24*(4), 673–677. https://doi.org/10.2307/2326224

Senbet, L.W. & Seward, J.K. (1995). Financial Distress, Bankruptcy and Reorganization, Chapter 28 in *Handbooks in Operations Research and Management Science*, 921-961. https://doi.org/10.1016/s0927-0507(05)80072-6

Sheikh, N. A., & Wang, Z. (2013). The impact of capital structure on performance. *International Journal of Commerce and Management*, *23*(4), 354–368. https://doi.org/10.1108/IJCoMA-11-2011-0034

Stiglitz, J. E. (1969). A re-examination of the Modigliani-Miller Theorem. *The American Economic* Review, 59 (5), 784-793. http://www.bidi.uam.mx:8331/login?url=https://bidi.uam.mx:8889/docview/871095757?accountid=37347

Stiglitz, J. E. (1972). Some aspects of the pure theory of corporate finance: Bankruptcies and takeovers. *The Bell Journal of Economics and Management Science, 3*(2), 458–482. https://doi.org/10.2307/3003033

Stiglitz, J. E. (1988). Why financial structure matters. *Journal of Economic Perspectives*, *2*(4), 121–126. https://doi.org/10.1257/jep.2.4.121

Tian, G. G. and R. Zeitun (2007), Capital structure and corporate performance: Evidence from Jordan. *Australasian Accounting Business and Finance Journal, 1* (4), 40–61. https://doi.org/10.2139/ssrn.2496174

Varaiya, N., Kerin, R. A., & Weeks, D. (1987). The relationship between growth, profitability and firm value. *Strategic Management Journal*, *8*(5), 487–497. https://doi.org/10.1002/smj.4250080507

Wippern, R. F. (1966). Financial structure and the value of the Firm. *Journal of Finance*, *21*(4), 615–633. https://doi.org/10.2307/2977522

Yang, C.C., Lee, C.F., Gu, Y.X. & Lee, Y.W. (2010). Co-determination of capital structure and stock returns – A LISREL approach: An empirical test of Taiwan stock market. *The Quarterly Review of Economics and Finance, 50*(2), 222-233. https://doi.org/10.1016/j.qref.2009.12.001

Zingales, L., Rajan, R. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance, 50*(5), 1421–1460. https://doi.org/10.2307/2329322

Annexes

Table A1. Literature review on studies about the relationship between Leverage and Firm Value in emerging markets.

Authors and Title	Markets, period and methodology	Dependent Variable(s)	Main independent variables	Results: Relationship of leverage and value
Cheng & Tzeng (2014)	645 companies listed in the Taiwan Stock Exchange 2000-2009 Panel data	Value of the firm (Market value of equity + book value of debt) /A	Leverage : D/A. Agency costs: Free cash flow per share. Firm quality: Z score. EPS: Earnings per share. Corporate tax rate: Tax expense/ Net income. Growth opportunities: Market to book value. Inflation. Non debt tax shield: Depreciation/A	Leverage (+) on firm value until it reaches its optimal structure. Positive effect is greater in good quality firms, big growth opportunities and big tax rate. Negative effect of leverage is bigger if big free cash flow, big non debt tax rate and big inflation
Chowdhury & Chowdhury (2010)	77 companies included in the Dhaka Stock Exchange and Chtitagong Stock Exchange. (Bangladesh) 1994-2003 Panel data	Share price	Leverage: LTD/A. Profitability: EPS. Public ownership: % of total shares. Size: Share capital. Dividend payout. Efficiency: Fixed asset turnover. Growth: Growth in sales. Liquidity: Current ratio. Business risk: Operating leverage	Leverage (+) on firm value
Hasan, Ahsan, Rajhans & Kaur (2013)	36 firms listed in the Dhaka Stock Exchange (Bangladesh) 2007-2012 Panel data	Tobin Q, ROA, ROE, EPS	Leverage: D/A, STD/A, LTD/A Size: Log Assets	All measures of leverage not significant with Tobin Q and ROE All measures of leverage (-) with ROA STD/A (+) with EPS, LTD/A (-) with EPS
Iturriaga & Crisóstomo (2010)	213 Brazilian public firms 1995-2004 Panel data	Market to book asset ratio adjusted with the sector	Leverage: D/A. Dividends: Dividends/ Equity. Ownership concentration: % biggest owner. Ownership cuadratic: non linear effect. Size=Log Assets. Profitability: ROA	Leverage (-) for firms with growth opportunities. Leverage (+) for firms without growth opportunities.

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

Ivashkovskaya & Stepanova (2011)	178 companies listed in 8 markets: Poland, Romania, Hungary, Czech Republic, Russia, Spain, Germany and Italy. 2004-2007. Panel data	Tobin Q	Leverage: D/A; Ownership: % owned by different investors; Ownership: dummy, 1 if % bigger than 25%; Size of the board. Size: Log Assets Growth: Asset growth in 4 years Industry: Dummy variables	Leverage (-) with Tobin Q
Javeed & Azeem (2014)	155 non financial firms listed at Karachi Stock Exchange (Pakistan) 2008-2012 Panel data	Tobin Q	Leverage: D/A. Board size: No. of directors on the board. Board independence: No. outside directors/ Total directors. CEO duality: Dummy 1 if CEO is also the chair man of the board, 0 otherwise. Managerial ownership: Shares owned by CEO, directors or their familites /Total shares. Ownership concentration: Owned by the five largest/ Total.	Leverage (+) with Tobin Q
Jawad, Shahzad, Ali, Ahmad & Ali (2015)	112 public firms from the textil sector of Pakistan 1999-2012. Panel data	Tobin Q, ROA	Leverage: D/A, STD/A, LTD/A, D/E. Size: Log Assets. Efficiency: Turnover Sales/Assets.	D/A and STD/A (+) with Tobin Q. LTD/A (-) with Tobin Q. D/E (-) with Tobin Q. All measures of leverage (-) with ROA.
Krishnan & Moyer (1997)	81 corporations from 4 Assian countries: Hong Kong, Malaysia, Singapore and Korea. Average of the last 5 years ending in 1992 Linear regression	Market return on Stocks, ROE, ROIC, Pre-Tax Operating profit margin.	Leverage: D/Market value of Equity, LTD/Market value of Equity. Size: Log Assets. Growth : Growth in sales Risk: Std. Dev. Operating income. Tax rate: Taxes / Income before taxes. Country: Dummy variable	Leverage does not affect any of the performance measures in this study

Lin & Chang (2011)	196 Taiwanese listed companies. 1993-2005. Panel threshold regression model.	Tobin Q	Leverage as the threshold variable: D/A. Size: Log Assets. Growth: Annual change in sales. Age: In years. Risk: Market value of equity/Book value of equity. Industry q: Use of average industry q.	If D/A is lower than 9.86%, Tobin Q increases 0.05% for every 1% increase in D/A. This increase lowers to 0.005% if D/A is between 9.86% and 33.33%. If D/A is bigger than 33.33%, Tobin Q stops increasing.
Mansourlakoraj (2015)	80 listed companies in Tehran Stock Exchange. 2009-2013. Panel data	Ln Tobin Q	FCF Free cash flow: Operating income + depreciation - tax - interest - dividends)/A. Leverage: Natural log of D/A. Size: Log Assets	Leverage (+) with Tobin Q
Naceur, Ben, & Goaied (2002)	28 listed companies in the Tunisia Stock Exchange. 1990-1997. Random probit model, panel data.	Market value of equity / Book value of equity.	Leverage: D/A. Dividends: Payout ratio of dividends. Profitability: ROE. Size: Log Asset. Industry: Dummy variable. Nature property: Dummy Private Vs. Public.	Leverage and dividends are not significant for firm value
Olokoyo (2013)	101 quoted firms in Nigeria. 2003-2007. Panel data.	Tobin Q, ROA, ROE	Leverage: D/A, STD/A, LTD/A. Size: Log Turnover.	Leverage (+) with Tobin Q. Leverage (-) with ROA and ROE.
Phung & Le (2013)	Non financial firms listed on Ho. Chi Min Stock Exchange. 2008-2011. Panel data.	Tobin Q	Foreign ownership (%). Size: Ln Assets. Investing opportunities: Capex/A. Liquidity: (Cash + equivalentes)/A. Profitability: ROA. Tangibility: Fixed A/A. Leverage: D/A.	Leverage (-) with Tobin Q
Priya, Balasundaram & Pratheepan (2015)	Listed manufacturing companies in Sri Lanka. 2007-2011. Panel data.	P/E, EPS	Leverage: D/A, E/A	Two measres of leverage (+) with P/E. D/A (+) with EPS. E/A (-) with EPS.

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

Ruan, Tian & Shiguang (2011)	197 China's civilian-run firms listed in the Chinese stock market. 2002-2007. Simult. OLS regres. and panel data.	Tobin Q	Managerial ownership: Shares owned by the board / Total shares. Leverage: D/A. Size: Log Total Assets.	Leverage (-) with Tobin Q
Sarma & Rao (1969)	30 Engineering companies from the Bombay Stock Exchange (India). 1962-1964-1965. Regression eq. for 3 cross-section.	Value of the firm / A	Expected tax adjusted earnings/A. Growth rate of tax adjusted earnings/A. Debt = D/A.	Leverage (+) for firm value. Leverage brings additional benefits than just the tax advantage.
Sheik & Wang (2013)	240 non financial firms listed in the Karachi Stock Exchange (Pakistan). 2004-2009. Panel data.	Market to book ratio, ROA	Leverage: D/A, LTD/A, STD/A. Tangibility: (Net fixed assets + Inventory)/A. Firm size: Ln Sales. Growth: Capital expenditure/A.	D/A and LTD/A (-) to Market to book ratio using OLS, but (+) when using Fixed Effects. STD/A was not signficant for maket to book. All the measures of leverage were (-) for ROA.
Tian & Zeitun (2007)	167 Traded companies in the Amman Stock Exchange (Jordan). 1989-2003. Panel data .	Tobin Q, P/E, Market to Book. Value ratio, ROA, ROE.	Leverage: D/A, STD/A, LTD/A, D/E, D/(D+E). Growth: Growth in sales 3 years. Size: LogAssets and LogSales. Risk: Std. Dev. Cash flow (Net inc + deprec). Tax: Taxes/Income before interes and taxes. Tangibility: Fixed Assets / Assets. Industry: Dummy variable 1-16. Crisis: Dummy variable 1 or 0.	All measures of leverage (-) with Tobin Q, P/E and Market to Book value ratio. Exception: STD/A (+) with Tobin Q.

Source: Own elaboration

Table A2. 69 companies included in the study: ticker, name, industry sector and bursatility level

No.	Ticker	Company name	Industry sector	Primary industry	Market liquidity
1	AC *	Arca Continental, S.A.B. de C.V.	Consumer Staples	Soft Drinks	High
2	ACCELSA B	Accel SAB de CV	Consumer Staples	Packaged Foods and Meats	Minimal
3	ALFA A	Alfa S.A.B de C.V	Industrials	Industrial Conglomerates	High
4	ALSEA *	Alsea, S.A.B. De C.V.	Consumer Discretionary	Restaurants	High
5	AMX L	America Movil S.A.B. de C.V.	Telecommunication Services	Wireless Telecommunication Services	High
6	ARA *	Consorcio ARA, S. A. B. de C. V.	Consumer Discretionary	Homebuilding	Medium
7	ASUR B	Grupo Aeroportuario del Sureste, SAB de C.V.	Industrials	Airport Services	High
8	AUTLAN B	Compañía Minera Autlán S.A.B. of C.V.	Materials	Steel	Medium
9	AXTEL CPO	Axtel S. A. B. De CV	Telecommunication Services	Integrated Telecommunication Services	Medium
10	AZTECA CPO	TV Azteca SAB de CV	Consumer Discretionary	Broadcasting	Medium
11	BAFAR B	Grupo Bafar S.A.B. de C.V.	Consumer Staples	Packaged Foods and Meats	Minimal
12	BEVIDES B	Farmacias Benavides, S.A.B. de C.V.	Consumer Staples	Drug Retail	Minimal
13	BIMBO A	Grupo Bimbo, S.A.B. de C.V.	Consumer Staples	Packaged Foods and Meats	High
14	CABLE CPO	Empresas Cablevisión, S.A.B. de C.V.	Consumer Discretionary	Cable and Satellite	Minimal
15	CEMEX CPO	CEMEX, S.A.B. de C.V.	Materials	Construction Materials	High
16	CERAMIC B	Internacional de Cerámica, S.A.B. de C.V.	Industrials	Building Products	Minimal
17	CIDMEGA *	Grupe, S.A.B. de C.V.	Consumer Discretionary	Hotels, Resorts and Cruise Lines	Low
18	CIE B	Corporación Interamericana de Entretenimiento, SAB de CV	Consumer Discretionary	Movies and Entertainment	Low
19	CMOCTEZ *	Corporación Moctezuma, SAB de CV	Materials	Construction Materials	Medium
20	CMR B	CMR, S.A.B. de C.V.	Consumer Discretionary	Restaurants	Minimal

21	COMERCI UBC	Controladora Comercial Mexicana SAB DE CV	Consumer Staples	Hypermarkets and Super Centers	N.A.
22	CONVER A	Convertidora Industrial, S.A.B. de C.V.	Materials	Paper Packaging	Minimal
23	CULTIBA B	Organización Cultiba, S.A.B. de C.V.	Consumer Staples	Soft Drinks	Medium
24	CYDSASA A	Cydsa SAB de CV	Materials	Commodity Chemicals	Low
25	DINE B	DINE, S.A.B. de C.V.	Financials	Real Estate Development	Low
26	FEMSA UBD	Fomento Económico Mexicano, S.A.B de C.V	Consumer Staples	Soft Drinks	High
27	FRAGUA B	Corporativo Fragua, S.A.B. De C.V.	Consumer Staples	Drug Retail	Low
28	GAP B	Grupo Aeroportuario del Pacífico, S.A.B. de C.V.	Industrials	Airport Services	High
29	GCARSO A1	Grupo Carso, S.A.B. de C.V.	Industrials	Industrial Conglomerates	High
30	GCC *	Grupo Cementos de Chihuahua SAB de CV	Materials	Construction Materials	Medium
31	GFAMSA A	Grupo Famsa S.A.B. de C.V.	Consumer Discretionary	Department Stores	Medium
32	GICSA B	Grupo Gicsa, S.A. de C.V.	Financials	Diversified Real Estate Activities	Medium
33	GIGANTE *	Grupo Gigante SAB de CV	Consumer Staples	Hypermarkets and Super Centers	Minimal
34	GISSA A	Grupo Industrial Saltillo, SAB de CV	Industrials	Industrial Conglomerates	Medium
35	GMD *	Grupo Mexicano de Desarrollo, S.A.B.	Industrials	Construction and Engineering	Low
36	GMEXICO B	Grupo México S.A.B. de C.V.	Materials	Diversified Metals and Mining	High
37	GPH 1	Grupo Palacio de Hierro SAB de CV	Consumer Discretionary	Department Stores	Minimal
38	GRUMA B	Gruma S.A.B. de CV	Consumer Staples	Packaged Foods and Meats	High
39	GSANBOR B-1	Grupo Sanborns, S.A.B. de C.V.	Consumer Discretionary	Department Stores	Medium
40	HERDEZ *	Grupo Herdez, S.A.B. de C.V.	Consumer Staples	Packaged Foods and Meats	Medium
41	HILASAL A	Hilasal Mexicana, S.A.B. de C.V.	Consumer Discretionary	Textiles	Minimal
42	HOGAR B	Consorcio Hogar, S.A.B. de C.V.	Consumer Discretionary	Homebuilding	N.A.

43	ICA *	Empresas ICA, S.A.B. de C.V.	Industrials	Construction and Engineering	Medium
44	ICH B	Industrias CH, SAB de CV	Materials	Steel	High
45	IDEAL B-1	Impulsora del Desarrollo y el Empleo en América Latina, S.A.B. de C.V.	Industrials	Construction and Engineering	Medium
46	KIMBER A	Kimberly - Clark de Mexico S.A.B. de C.V.	Consumer Staples	Household Products	High
47	KUO B	Grupo Kuo, S.A.B. de C.V.	Industrials	Industrial Conglomerates	Low
48	LAMOSA *	Grupo Lamosa, SAB de CV	Industrials	Building Products	Low
49	LIVEPOL C-1	El Puerto de Liverpool, SAB de CV	Consumer Discretionary	Department Stores	High
50	MASECA B	Grupo Industrial Maseca, SAB de CV	Consumer Staples	Packaged Foods and Meats	Low
51	MEDICA B	Médica Sur, SAB de CV	Healthcare	Healthcare Facilities	Low
52	MEXCHEM *	Mexichem, S.A.B. de C.V.	Materials	Commodity Chemicals	High
53	MINSA B	Grupo Minsa S.A.B. de C.V.	Consumer Staples	Packaged Foods and Meats	Minimal
54	NEMAK A	Tenedora Nemak, S.A. de C.V.	Consumer Discretionary	Auto Parts and Equipment	High
55	OMA B	Grupo Aeroportuario del Centro Norte, S.A.B. de C.V.	Industrials	Airport Services	High
56	PAPPEL *	Bio-PAPPEL SAB de CV	Materials	Paper Packaging	Medium
57	PASA B	Promotora Ambiental SAB de CV	Industrials	Environmental and Facilities Services	Minimal
58	PE&OLES *	Industrias Penoles S.A.B. DE CV	Materials	Precious Metals and Minerals	High
59	PINFRA *	Promotora y Operadora de Infraestructura SAB de CV	Industrials	Construction and Engineering	High
60	POCHTEC B	Grupo Pochteca S.A.B. de C.V.	Industrials	Trading Companies and Distributors	Low
61	POSADAS A	Grupo Posadas, S.A.B. de C.V.	Consumer Discretionary	Hotels, Resorts and Cruise Lines	Minimal
62	RASSINI A	Rassini, S.A.B. de C.V.	Consumer Discretionary	Auto Parts and Equipment	Medium
63	RCENTRO A	Grupo Radio Centro, S.A.B. de C.V. (BMV:RCENTRO A)	Consumer Discretionary	Broadcasting	Minimal
64	SARE B	Sare Holding SAB de CV	Consumer Discretionary	Homebuilding	Low
65	SORIANA B	Organizacion Soriana SAB de CV	Consumer Staples	Hypermarkets and Super Centers	Medium
66	TLEVISA CPO	Grupo Televisa, S.A.B.	Consumer Discretionary	Broadcasting	High

67	VASCONI *	Grupo Vasconia, S.A.B.	Consumer Discretionary	Housewares and Specialties	Minimal
68	VITRO A	Vitro, S.A.B. de C.V.	Materials	Metal and Glass Containers	Medium
69	WALMEX *	Wal-Mart de Mexico SAB De CV	Consumer Staples	Hypermarkets and Super Centers	High

Source: Own elaboration using data from Capital IQ and Infosel.

Table A3
Descriptive statistics of the variables (2004-2014)

COMPLETE SAMPLE								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.124564	0.001817	0.004151	0.016172	0.026381	-0.108309	-0.085635	0.016018
Median	-0.045975	0.000511	0	0	0.024548	-0.00735	-0.0419	0.005785
Maximum	1.103347	0.541023	0.872627	24.75863	0.5989	24.0886	359.8925	0.730245
Minimum	-5.845772	-0.3837	-0.756913	-28.05965	-0.255627	-31.6807	-281.4303	-0.627349
Std. Dev.	0.45676	0.078709	0.111796	1.559299	0.078517	2.796055	17.32166	0.168699
Observ.	753	753	753	753	753	690	759	757
LOW LEVERAGE								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.113863	0.001056	0.004268	0.005162	0.025248	-0.019309	0.029119	0.018751
Median	-0.073029	0.000687	0	0	0.027919	0.0556	0.0577	0.008592
Maximum	0.978095	0.302392	0.487891	0.952709	0.5989	24.0886	36.2147	0.612561
Minimum	-2.680963	-0.355924	-0.382573	-0.965483	-0.255627	-31.6807	-46.2535	-0.627349
Std. Dev.	0.324958	0.068338	0.084925	0.170034	0.069747	3.048601	4.292258	0.158892
Observ.	373	373	373	373	373	340	374	373
HIGH LEVERAGE								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.135067	0.002564	0.004036	0.02698	0.027494	-0.194767	-0.19711	0.013364
Median	-0.03016	-0.001426	0.000082	0.000424	0.018926	-0.10835	-0.1364	0.002084
Maximum	1.103347	0.541023	0.872627	24.75863	0.412405	10.0095	359.8925	0.730245
Minimum	-5.845772	-0.3837	-0.756913	-28.05965	-0.251485	-20.6695	-281.4303	-0.615431
Std. Dev.	0.556853	0.08779	0.133117	2.189914	0.086342	2.528114	23.9655	0.177876
Observ.	380	380	380	380	380	350	385	384

http://dx.doi.org/10.22201/fca.24488410e.2018.1377

SMALL SIZE								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.107758	0.003186	0.00251	0.000994	0.02116	-0.115857	-0.113079	0.012514
Median	-0.033154	0.000687	0	0	0.020136	0.0001	-0.0636	0.004792
Maximum	0.978095	0.541023	0.798399	6.04081	0.5989	24.0886	36.2147	0.543169
Minimum	-5.171503	-0.3837	-0.756913	-5.178201	-0.246353	-31.6807	-46.2535	-0.627349
Std. Dev.	0.452964	0.085229	0.119622	0.678029	0.082801	3.33579	4.764638	0.162226
Observ.	373	373	373	373	373	340	374	373
BIG SIZE								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.14106	0.000473	0.005761	0.031071	0.031506	-0.100977	-0.058975	0.019422
Median	-0.063706	0.000192	0	0	0.027962	-0.01575	-0.0419	0.007747
Maximum	1.103347	0.338946	0.872627	24.75863	0.400502	7.5626	359.8925	0.730245
Minimum	-5.845772	-0.355685	-0.42075	-28.05965	-0.255627	-17.0602	-281.4303	-0.615431
Std. Dev.	0.460455	0.071823	0.103675	2.091089	0.073822	2.150691	23.87914	0.174902
Observ.	380	380	380	380	380	350	385	384
LOW PROFITABILITY								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	dPROFIT2	dRISK
Mean	-0.050713	0.004464	0.001775	0.015455	0.017554	-0.134951	-0.088617	0.005557
Median	-0.02171	0.003788	0.001487	0.002224	0.015327	0.0032	0.0517	0.000135
Maximum	0.911511	0.541023	0.798399	24.75863	0.5989	10.0095	14.957	0.558981
Minimum	-2.680963	-0.3837	-0.756913	-28.05965	-0.255627	-20.6695	-32.6169	-0.58857
Std. Dev.	0.279703	0.086032	0.118865	2.138636	0.082015	2.257696	3.220926	0.164683
Observ.	383	383	383	383	383	350	385	383

HIGH PROFITABILITY								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.201009	-0.000923	0.00661	0.016915	0.035519	-0.080884	-0.082564	0.026731
Median	-0.113101	-0.00468	0	0	0.037142	-0.0246	-0.12145	0.013612
Maximum	1.103347	0.338946	0.872627	6.850967	0.412405	24.0886	359.8925	0.730245
Minimum	-5.845772	-0.355924	-0.382573	-1.948292	-0.251485	-31.6807	-281.4303	-0.627349
Std. Dev.	0.57677	0.070342	0.104079	0.469229	0.073727	3.261976	24.47554	0.172278
Observ.	370	370	370	370	370	340	374	374
LOW RISK								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	*dSIZE*	*dPROFIT1*	*dPROFIT2*	*dRISK*
Mean	-0.110247	0.00306	0.002359	0.000365	0.022758	-0.097218	-0.124672	0.01343
Median	-0.041876	0.000926	0	0	0.021469	-0.03275	-0.12	0.005288
Maximum	0.978095	0.541023	0.798399	6.04081	0.5989	10.0095	14.957	0.543169
Minimum	-5.171503	-0.3837	-0.756913	-5.178201	-0.246353	-20.6695	-32.6169	-0.627349
Std. Dev.	0.448486	0.083532	0.117817	0.667939	0.080712	2.294508	3.300889	0.160374
Observ.	384	384	384	384	384	350	385	384
HIGH RISK								
	dVit	*dLEVER1*	*dLEVER2*	*dLEVER3*	dSIZE	dPROFIT1	dPROFIT2	dRISK
Mean	-0.139462	0.000523	0.006015	0.032622	0.030152	-0.119726	-0.045449	0.018683
Median	-0.052129	-0.000105	0	0	0.0277	0	-0.01415	0.007716
Maximum	1.103347	0.338946	0.872627	24.75863	0.400502	24.0886	359.8925	0.730245
Minimum	-5.845772	-0.355685	-0.42075	-28.05965	-0.255627	-31.6807	-281.4303	-0.615431
Std. Dev.	0.465355	0.073445	0.105294	2.122188	0.076092	3.235614	24.46451	0.177039
Observ.	369	369	369	369	369	340	374	373

Source: Own elaboration using data from Capital IQ

Note: : Change in the Value of the firm for time measured with first differences on Tobin's Q = (Market value of equity + Book value of debt) / Book value of Assets. Change in Leverage measured with first differences on the debt ratio = Debt /Assets. Change in Leverage measured with first differences on the debt to invested capital = Debt /(Debt + Equity). Change in Leverage measured with first differences on the debt to equity ratio = Debt /Equity. : Change in the Size of the firm measured with first differences on Log (Assets). : Change in Profitability measured with first differences on ROA = EBIT/Assets.: Change in Profitability measured with first differences on ROIC = (EBIT – Taxes)/(Debt + Equity).: Change in Risk measured with fist differences on the Log of the standard deviation of EBITDA from the last 5 years.