Journal of Business Studies Quarterly
2011, Vol. 3, No. 2, pp. 10-24 ISSN 2152-1034

Journal of Business Studies Quarterly jbsq.org

Stock Trading and Capital Structure in Tunisian Stock Exchange

Karim Ben Khediri, CEROS, University Paris Ouest Nanterre La Défense & University of Carthage, FSEG Nabeul
Wissem Daadaa, University of Carthage, FSEG Nabeul

Abstract

This study examines the impact of stock trading on capital structure using a sample of Tunisian publicly traded firms over the period 2000-2009. The study uses pooling regressions as well as panel data methodology. We find that leverage is negatively related to stock trading measures. Furthermore, leverage is positively related to asset tangibility and size, and negatively related to non-debt tax shields and profitability. This is the first paper that examines the relation between stock trading and capital structure in Tunisia.

Keywords: Capital structure, Debt, Leverage, liquidity, Stock trading, Volume.

Introduction

Modigliani and Miller (1958) show that in the perfect financial market, the capital structure decision is irrelevant to the firm. This theory has since been extended to demonstrate the existence of an optimal capital structure. The main competitive models are the static trade-off theory and the pecking order theory. According to the static trade-off model, there is an optimal or target capital structure. However, the pecking order theory suggests that firms tend to prefer retained earnings, then debt and external equity financing. Many empirical studies tested these theories and identified several factors explaining capital structure decision, such as profitability, firm size, and growth opportunities. Although, the stock liquidity is been ignored for long time in previous researches, it has received attention recently as potential determinant of leverage. Stock market liquidity is a major concern to all those involved in equity trading and capital structure, and for that reason recent papers (Frieder and Martell, 2006; Lipson and Mortal, 2009) have examined this issue. However, these empirical studies are exclusively based on U.S. firms and hence we are not sure that their results can be generalized to other firms in other countries that are significantly different from the U.S. context.

Rajan and Zingales (1995) argue that the differences in capital structure among countries may exist partly due to differences in the tax code, bankruptcy laws, the state of development of bond markets and patterns of ownership. Demirgüç-kunt and Maksimovic (1999) find that institutional differences between developed and developing countries explain the debt level. Jong et al. (2008) find that firm-specific determinants of leverage differ across countries. They show that country-specific factors can influence leverage both directly and indirectly through their impact on the effect of firm-specific factors.

The Tunisian context provides an interesting setting for studying this relation because it is different from the U.S. context. First, in contrast to the U.S. that is a development country with a market-based financial system, Tunisia is a developing country with a bank-based system. Also, Tunisia stock market is smaller and less liquid compared to the U.S. stock market. The mean value of stock market capitalization to gross domestic product (GDP) in Tunisia (12.05%) is lower than that in the U.S. (138.37%) for the period 2000-2008. The mean value of stock market total value traded to GDP is also lower in Tunisia (1.61%) than that in the U.S. (253.87%) for the same period. Furthermore, the mean value of stock market turnover ratio from 2000 to 2008 is 12.65% in Tunisia while it is 184.45% in the U.S. there are also some difference between Tunisia and other countries as regard variables related to corporate governance such as the country's legal enforcement and shareholder/creditor right protection. These differences in institutional characteristics result in different level of leverage between Tunisian and U.S firms. In fact, Tunisian firms are more leveraged that their U.S. counterparts because they rely more on bank loans rather than financial market financing. This suggests that the stock liquidity may be less relevant in the equity-debt level decisions for Tunisian firms. Second, compared with to the U.S. firms that have low ownership concentration, Tunisian firms are closely held. This difference in ownership structure may have an effect on the stock liquidity and hence on capital structure. Hence, Tunisians firms with highly concentrated ownership prefer to issue debt rather than equity because shareholders do not want to risk losing control of their companies.
Furthermore, Tunisian law provides that dividend payment in respect of shares is not subject to withholding tax. The corporate tax rate varies between 30% and 35%. Thus, these rates are more important compared with other countries.

Previous researches that examine the relationship between capital structure and stock liquidity used friction measures as proxies for liquidity (for example, quoted, relative and effective spreads). Instead using these last measures that reflect the transaction cost in the market, we extend previous research by using trading activity measures that reflect the extent of trading activity (depth and trading volume). Barclay et al. (1998) consider that the trading activity measures, such as volume, are the best indicator of liquidity. Aitken and Comerton-Forde (2003) note that trading activity measures are simple to calculate and have widespread acceptance particularly among market professionals and decisions makers. We fill this gap in the literature by studying the effect of stock trading activity on capital structure in Tunisia.
The remainder of the paper is organized as follows. Section 2 presents a brief review of the literature. Section 3 describes the methodology and data. Section 4 presents and discusses the empirical results. Finally, section 5 concludes the paper.

Literature Review

Theoretical studies on capital structure have seen remarkable progress since the irrelevance proposition of Modigliani and Miller (1985). By relaxing the assumptions of perfect financial market, many studies show that capital structure is relevant for the firm. There are two

competitive theoretical models of capital structure: the static tradeoff theory and the pecking order theory. The first model suggests that firms fix a target debt ratio, based on the tradeoff of the effect of taxes, bankruptcy costs and agency costs. According to the second model, firms prefer first retained earnings, then less risky debt and last external equity financing. This order of preference is explained by the existence of the asymmetric information problem between insider and outside investors. Empirical studies have shown that growth opportunities, profitability, asset tangibility, non-debt tax shield, and firm size are the main determinants of capital structure.
Frieder and Martell (2006) as well as Lipson and Mortal (2009) note that the stock liquidity is absent in empirical work on capital structure. They justify the relation between liquidity and capital structure by the relation between the cost of equity and capital structure.

Butler and al. (2005) provide empirical evidence suggesting that liquidity is an important determinant of the cost of raising external capital. Using a sample of 2387 seasoned equity offerings over the period 1993-2000, they find that investment bank's fees are lower for firms with more liquid stock. Lipson and Mortal (2009) point out that capital structure decision depend on the arbitrage between the net tax benefit of debt and the net cost of equity. Since the cost of equity is negatively related to stock liquidity, they argue that firms with more liquid stock have more incentives to use more equity financing and therefore will have lower leverage.
Frieder and Martell (2006) use a two-stage least squares analysis to examine the interaction between liquidity and leverage on a sample of NYSE-listed firms over the period 1988-1998. They find that these variables are jointly determined. Leverage has a positive effect on liquidity, but more liquid firms are more likely to issue equity than debt. Using a sample of NASDAQ-listed firms over the period 1986-2006.

With a sample of 6000 Nasdaq IPOs over the1972–1998 period, Eckbo and Norli (2005) test the relation between leverage, turnover and liquidity after IPO, they calculate the average annual values of monthly turnover, computed as trading volume divided by the number of shares outstanding. These stocks have significantly greater turnover than either size-matched or size/BM-matched firms in each of the 5 years starting in year 1. These stocks exhibit significantly greater stock turnover and are less leveraged.
Kryzanowsk et al. (2010) examine the link between stock liquidity and equity issue. They examine the behavior of various liquidity proxies after equity issue. They find that spreads, dollar volume and depths follow an approximate V-shaped pattern through equity issuance cycle.

Data and Methodology

Market Description and Trading Volume in TSE

The Tunis stock exchange (TSE) was founded in 1969 and was privatized in 1994. Since 1996, the TSE has been an electronic pure order driven market. Orders are placed by investors through brokers. The TSE is a pure order driven market without market makers. The TSE operates as continuous market for the more actively traded stocks and a call auction (fixing) for the less liquid stocks.
Significant improvement is recorded in the TSE in the recent decade compared to the last decade, as expressed by market capitalization, value of stock trading, and number of listed shares reported in Table (1). Further, the stock market capitalisation represents 23% of country's GDP and the share of foreigners in stock market capitalisation represents 21.92% at the end of 2009.

Table I Statistics for the Tunis Stock Exchange

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Number of listed firms	44	45	46	45	44	45	48	51	50	52
Market capitalization in TMD*	3889	3239	2842	2976	3085	3840	5491	6527	8301	12227
Number of trading shares in Million	58	51	43	47	43	83	143	102	260	364
Value traded in TMD	1814	1204	1006	948	690	1661	4606	1744	4130	3325
TUNINDEX index	1192.5	1442.6	1119	1250	1331	1615	2331	2614	2892	4291,7

*TMD : Tunisian Million Dinar

Significant improvement is recorded in the TSE in the recent decade compared to the last decade, as expressed by market capitalization, trading volume, and number of listed shares as presented in Table 1.

Although creates since 1969, the TSE started its expansion only about the Nineties with a rise in range into 2003. We conclude a sustained high growth and continuous of all the indicators and an increase in the performance. We also detect the record of the TSE indices in 2009. The TSE was able to maintain a respectable level of performance and a growth in trading volume in 2009. The increase in stock exchange capitalization in the last few years can be explained by the rise in the total value of the equity new issues and the initial public offering. The shareholders and the investors finally agreeing to take the risk to participate in the market and the companies accept to finance their development strategies by the financial market. In fact, to encourage the company to access on the stock market, a law was promulgated and which envisages the reduce of the tax rate to 20% during 5 years for companies that issues more than 30% of their capital. The TSE has recorded into 2008 the third best world performance, makes for more than 7 years a remarkable growth.

Sample Construction

Our sample includes all Tunisian firms that are listed on the Tunis Stock Exchange for the period 2000-2009. We exclude corporations in the financial services industry since their balance sheets have a different structure from those of the non-financial firms and thus have distinctive capital structure. This produces a final sample of 23 non-financial firms. The financial and accounting data are manually collected from annual reports and the TSE statistics.

Variables

Trading Measures

Liquidity measures may be divided into two broad categories: trade-based measures and order-based measures. In this paper, we use the first category and measure the trading activity by four different variables: the number of shares traded (volume), the number of shares traded divided by the number of shares on issue (relative volume), the number of trades (frequency) and the value of shares traded (value). These measures have some advantages compared to the order-based measures. Aitken and Comerton-Forde (2003) note that they are simple to calculate and have widespread acceptance particularly among market professionals and decisions makers.

Furthermore, detailed transaction data (bid-ask speard, for example) for TSE are not widely available.

Leverage

Following previous studies, we use two alternative measures of leverage, namely book leverage and market leverage. Book leverage is defined as book value of total debt divided by book value of assets, while market leverage is defined as book value of total debt divided by market value of assets. We calculate the market value of assets as the sum of total liabilities and the market value of the common stocks. Following, Rajan and Zingales (1995), we use total debt to measure leverage. However, previous studies that use both long-term debt and total debt generally find similar results for both measures.

Control Variables

The control variables used are mainly those suggested by earlier studies on capital structure. They include measure of growth opportunities, profitability, asset tangibility, non-debt tax shield, and firm size.

Growth Opportunities

According to the trade-off model, firms with more growth opportunities are likely to use more equity in order to mitigate the underinvestment problem. Hence we expect a negative relationship between growth and leverage. However, according to the pecking order model, high-growth firms tend to prefer debt because they face more information asymmetry and hence higher cost of equity than low-growth firms. Hence we expect a positive relationship between growth and leverage. As in most empirical studies, we measure growth opportunities as the ratio of the market value of total assets divided by the book value of total assets (Tobin's Q).

Profitability

According to the pecking order theory, more profitable firms prefer internal financing to debt, and therefore will be less leveraged. Hence, a negative relationship is expected between profitability and leverage. However, according to the trade-off theory, more profitable firms have higher debt capacity and more incentives to prefer debt in order to benefit from tax shield. Hence, a positive relationship is expected between profitability and leverage. We measure profitability by the return on assets (ROA), defined as the ratio of earnings before interest and taxes divided by the book value of total assets.

Asset Tangibility

According to the agency theory, tangible assets can be used as collateral, reducing the risk de creditors and hence the agency costs of debt. Also tangible assets allow debtholders to recover more value in case of bankruptcy. Hence we expect a positive relationship between tangible assets and leverage. We measure asset tangibility (AT) by the ratio of fixed assets and inventory scaled by the book value of total assets.

Firm Size

According to the trade-off theory, larger firms tend to be more diversified and thus have less bankruptcy costs. Hence we expect a positive relationship between firm size and leverage. However, according to the pecking order theory, larger firms have less asymmetric information and thus tend to issue more equity and to be less leveraged. Hence we expect a negative relationship between firm size and leverage. Firm size is measured by the natural logarithm of book value of total assets.

Non-Debt Tax Shields

Firms have incentives to use more debt in order to benefit from tax shield due to interest deductibility. DeAngelo and Masulis (1980) argue that the non-debt tax shields, such as deductions for depreciation, are substitutes for the tax benefits of debt, and a firm with larger non-debt tax shields is more likely to use less debt. Hence we expect a negative relationship between non-debt tax shields and leverage. We measure the non-debt tax shields by the ratio of depreciation expenses divided by the book value of total assets (Dep). Table 2 presents a description of variables.

Table II Description of variables

Variable	Definition	Predicted sign
Leverage measures		
Book leverage (BLev)	book debt / book value of assets	
Market leverage (MLev)	book debt / market value of assets	
Stock trading measures		
Volume (Vol)	Natural logarithm of the number of shares traded	-
Relative Volume (RVol)	Number of shares traded / number of shares on issue	-
Frequency (Freq)	Natural logarithm of number trades	-
Value	Natural logarithm of value of shares traded	-
Firm characteristics		
Tobin's Q (TQ)	Market value of assets / the book value of assets	
Return On Assets (ROA)	Earnings before interest and taxes / book value of assets	+/-
Asset tangibility (AT)	Tangible fixed assets and inventory / book value of assets	+/-
Depreciation (Dep)	Depreciation expenses / book value of assets	+
Size	Natural logarithm of book value of assets	+/-

Table 3 presents descriptive statistics (Mean, first quartile (Q1), Median, third quartile (Q3) and Standard deviation (SD)). The average book leverage is 50.06%, with standard deviation equal to 26.24%, while the mean of market leverage is 41.88%, with almost the same standard deviation. The mean (median) value of relative volume is 19.31% (14.86%). The average (median) of the value of shares traded is 11000 (5521) thousand TND. The mean (median) value of volume is 924689 (403670). The average (median) frequency is 3965 (2529).

Table III Descriptive statistics

	Mean	Q1	Median	Q3	S.D.
Book leverage (%)	50.06	35.42	49.62	62.21	26.24
Market leverage (%)	41.88	19.64	40.99	61.75	24.86
Volume	924689	74194	403670	850780	1864709
Relative volume (%)	19.31	4.68	14.86	28.12	18.81
Value in TMD	11.000	1.226	5.521	14.680	14.989
Frequency	3965	557	2529	4988	4750
Tobin's Q	1.34	0.91	1.15	1.5	0.63
ROA (%)	5.22	2.27	6.53	9.54	6.51
Asset tangibility (%)	48.00	35.77	47.71	59.41	15.19
Depreciaition (%)	4.72	2.30	4.49	6.39	3.55
Size in TMD	120.568	144.93	52.575	76.916	261.667

Table 4 presents the Pearson's correlations coefficients for dependent and independent variables. We find that all measures of trading activities are negatively correlated with leverage measures (based on book value or market value), as expected. The results also show a high positive correlation between the four measures of stock trading activity, with correlation coefficients range from 0.56 to 0.86. The correlations among the others explanatory variables are generally less than 0.48, suggesting that collinearity is not a serious problem.

Table IV Pearson's correlation coefficients

This table presents correlation coefficients for dependent variables, trading activity measures, and other explanatory variables. We lag liquidity measures and other explanatory variables.

	BLev	MLev	RVol	Vol	Value	Freq	TQ	ROA	AT	Size
MLev	0.82***									
RVol	-0.12	-0.09								
Vol	-0.09	-0.00	0.57***							
Value	-0.25***	-0.26***	0.57***	0.81***						
Freq	-0.14*	-0.08	0.56***	0.86****	0.84***					
TQ	-0.14*	-0.50***	-0.06	-0.08	0.26***	0.05				
ROA	-0.58***	-0.59***	0.16**	0.03	0.26***	0.09	0.35***			
AT	0.35***	0.35***	-0.10	-0.14*	-0.30***	-0.17**	-0.13	-0.28***		
Size	0.43***	0.42***	-0.23***	0.21***	0.25***	0.23*	0.08	-0.23***	-0.01	
Dep	0.27***	0.17**	-0.09	0.14**	-0.01	0.06	-0.07	-0.48***	0.26***	0.29***

* Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

Methodology

To study the link between stock trading and capital structure, we use univariate analysis as well as multivariate analysis. First, we group sample firms by median according to the book value of assets, and within each subsample, we compare book leverage and Market leverage for

more liquid firms and less liquid firms and test the difference between the two groups of firms. Second, we estimate the following equation to examine the impact of stock trading on leverage. The specification is similar to Lipson and Mortal (2009) but extended to a panel setting.

$$leverage_{i,t} = \alpha_0 + \alpha_1 Stock \quad trading_{i,t-1} + \alpha_2 TQ_{i,t-1} + \alpha_3 ROA_{i,t-1}$$

$$+ \alpha_4 AT_{i,t-1} + \alpha_5 Dep_{i,t-1} + \alpha_5 Size_{i,t-1} + \mu_i + \varepsilon_{i,t}$$

Where leverage is the debt ratio of firm *i* at time *t* ; Stock trading$_{i,t-1}$ is lagged measures of stock trading; TQ $_{i,t-1}$ is lagged Tobin's Q; ROA $_{i,t-1}$ is lagged return on assets; AT $_{i,t-1}$ is lagged tangible assets; Dep $_{i,t-1}$ is lagged depreciation expenses; Size $_{i,t-1}$ is lagged size; α_1 is a constant; μ_i is the individual effect of firm *i*; and $\varepsilon_{i,t}$ is the error term.
We construct regressions where the regressors (including liquidity measures) are lagged one year in relation to the dependent variables (leverage).

Results

Univariate Analysis

Table 5 provides a univariate analysis of leverage and trading activity after controlling for size. The results show that both book and market leverage is higher for firms having low trading activity as proxied by the four measures. This result corroborates the finding of Lipson and Mortal (2009), suggesting that more liquid firms have more incentives to prefer equity financing and, thus will be less leveraged. Furthermore, we find that leverage is greater for larger firms. This positive relation between leverage and size in Tunisian context is consistent with prior studies. This result may be explained by the fact that larger firms have increased debt capacity since they are less likely to be bankrupt because they are more diversified and have more stable cash flow.

Table V Univariate Results

	Smallest firms		Largest firms	
	Book leverage	Market leverage	Book leverage	Market leverage
Volume				
Low	0.473	0.439	0.653	0.497
High	0.337	0.271	0.538	0.468
P-value (t-test)	0.758	0.053*	0.007***	0.853
Relative volume				
Low	0.426	0.381	0.618	0.463
High	0.384	0.329	0.575	0.503
P-value (t-test)	0.249	0.250	0.004***	0.001***
Value				
Low	0.458	0.439	0.653	0.552
High	0.353	0.271	0.538	0.411
P-value (t-test)	0.317	0.069*	0.043**	0.591
Frequency				
Low	0.461	0.411	0.627	0.483
High	0.350	0.299	0.564	0.482
P-value (t-test)	0.786	0.251	0.241	0.074*

* Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

Multivariate Analysis

Tables 6-9 report the regression results for the capital structure equation using the two alternative measures of leverage and three different methodologies: pooling regression, random effect model, and fixed effect model. To identify which empirical methodology is most suitable, we perform two statistical tests: the first is the Lagrangian Multiplier (LM) test (Breusch and Pagan, 1980) of the random effect model; the second is the Hausman specification test (Hausman, 1978) to compare the fixed effect and the random effect models. If the model is correctly specified and if individual effects are uncorrelated with the independent variables, the fixed effect and random effect estimators should not be statistically different.

Since the Lagrangian Multiplier (LM) test of the random effect model rejects the null hypothesis of zero unobservable individual effect at 1% significance level, the pooling regression is not suitable in this case. Panel regression results show that the all proxies of stock trading activity (volume, relative volume, frequency and value) have a negative impact on leverage. This negative relationship is robust for different leverage measures and empirical models. Our results are consistent with the finding of Lipson and Mortal (2009), suggesting that more liquid firms prefer equity financing when raising capital and therefore will have lower leverage.

For the control variables, we find results consistent with prior studies. Tobin's Q is positively related to book leverage, but negatively related in market leverage regressions. Profitability has a negative and significant effect on leverage. This result is consistent with the pecking order theory, suggesting that firms use retained earnings first to finance investment, and therefore more profitable firms will be less leveraged. This finding corroborates the results of Titman and Wessels (1988), Rajan and Zingales (1995) and Booth et al. (2001). Asset tangibility is positively and significantly linked to leverage, suggesting that more collaterized assets reduce the agency problem, as shown by Jensen and Meckling (1976). Furthermore, the value of tangible assets is less sensitive in the case of bankruptcy. This result is consistent with Rajan and Zingales (1995). Size is positively and significantly related to leverage. This result corroborates the argument that larger firms are less likely to be bankrupt and therefore will be more leveraged. Finally, the relationship between depreciation and leverage is negative and statistically significant. This result corroborates the argument of DeAngelo and Masulis (1980) that firms with larger non-debt tax shields, as proxied by depreciation, tend to be less leveraged. This finding is also consistent with the empirical result of Wald (1999).

Table VI Effect of Volume on Capital Structure

This table provides the regression results of relative volume on capital structure using alternative models (pooling regression, random effect model, and fixed effect model) and two measures of leverage (book and market). The Lagrangian Multiplier test (LM test) is used to test the random effect model versus the pooling regression. The Hausman specification test is used to test the fixed-effect model versus the random effect model. Regression standard errors are adjusted for heteroscedasticity. P-values are provided in parenthesis below the coefficient estimates. * Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

	Book leverage			Market leverage		
	Pooled	Random Effect	Fixed Effect	Pooled	Random Effect	Fixed Effect
Intercept	-0.745***	-0.164	0.901	-0.745***	-0.116	1.582***
	(0.000)	(0.586)	(0.224)	(0.000)	(0.681)	(0.009)
Volume	-0.015*	-0.029***	-0.034***	-0.002	-0.019**	-0.024**
	(0.072)	(0.004)	(0.004)	(0.707)	(0.019)	(0.020)
Tobin's Q	0.006	0.055*	0.098**	-0.147***	-0.083***	-0.031
	(0.806)	(0.093)	(0.013)	(0.000)	(0.000)	(0.168)
ROA	-1.970***	-0.814***	-0.636***	-1.496***	-0.997***	-0.853***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.002)
AT	0.407***	0.122	-0.040	0.430***	0.324***	0.209*
	(0.000)	(0.280)	(0.731)	(0.000)	(0.008)	(0.096)
Size	0.110***	0.084***	-0.004	0.121***	0.076***	-0.072
	(0.000)	(0.002)	(0.947)	(0.000)	(0.005)	(0.226)
Dep	-0.841	0.073	0.062	-1.638***	-1.292***	-1.432***
	(0.124)	(0.885)	(0.907)	(0.000)	(0.006)	(0.006)
LM test	χ^2 (1) = 154.15***			χ^2 (1) = 122.72***		
Hausman test	χ^2 (6) = 1.39			χ^2 (6) = 25.00***		
F / Wald χ^2	9.29***	40.92***	4.23***	59.13***	70.02***	4.73***
R^2	0.516	0.373	0.037	0.682	0.612	0.020
Observations	147	147	147	147	147	147

* Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

Table VII Effect of Relative Volume on Capital Structure

This table provides the regression results of relative volume on capital structure using alternative models (pooling regression, random effect model, and fixed effect model) and two measures of leverage (book and market). The Lagrangian Multiplier test (LM test) is used to test the random effect model versus the pooling regression. The Hausman specification test is used to test the fixed-effect model versus the random effect model. Regression standard errors are adjusted for heteroscedasticity. P-values are provided in parenthesis below the coefficient estimates. * Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

	Book leverage			Market leverage		
	Pooled	Random Effect	Fixed Effect	Pooled	Random Effect	Fixed Effect
Intercept	-0.754***	-0.366	0.885	-0.786***	-0.179	1.699***
	(0.001)	(0.218)	(0.249)	(0.000)	(0.537)	(0.004)
RVol	0.116	-0.709	-0.118**	0.131*	-0.144***	-0.212***
	(0.167)	(0.179)	(0.026)	(0.071)	(0.010)	(0.001)
Tobin's Q	0.022	0.050	0.096**	-0.139***	-0.076***	-0.013
	(0.424)	(0.162)	(0.027)	(0.000)	(0.001)	(0.557)
ROA	-2.142***	-0.832***	-0.598***	-1.581***	-0.945***	-0.736***
	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)	(0.001)
AT	0.454***	0.203*	0.064	0.452***	0.368***	0.275***
	(0.000)	(0.077)	(0.539)	(0.000)	(0.002)	(0.010)
Size	0.108***	0.067**	-0.045	0.125***	0.059**	-0.113**
	(0.000)	(0.015)	(0.525)	(0.000)	(0.023)	(0.035)
Dep	-1.071**	0.193	0.267	-1.707***	-1.216***	-1.306***
	(0.043)	(0.706)	(0.620)	(0.000)	(0.007)	(0.006)
LM test	χ^2 (1) = 138.04***			χ^2 (1) = 104.51***		
Hausman test	χ^2 (6) = 0.48			χ^2 (6) = 5.12		
F / Wald χ^2	9.30***	37.95***	3.40***	53.17***	71.68***	5.72***
R^2	0.512	0.400	0.004	0.690	0.591	0.000
Observations	147	147	147	147	147	147

Table VIII Effect of Frequency on Capital Structure

This table provides the regression results of relative volume on capital structure using alternative models (pooling regression, random effect model, and fixed effect model) and two measures of leverage (book and market). The Lagrangian Multiplier test (LM test) is used to test the random effect model versus the pooling regression. The Hausman specification test is used to test the fixed-effect model versus the random effect model. Regression standard errors are adjusted for heteroscedasticity. P-values are provided in parenthesis below the coefficient estimates. * Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

	Book leverage			Market leverage		
	Pooled	Random Effect	Fixed Effect	Pooled	Random Effect	Fixed Effect
Intercept	-0.606***	-0.196	0.768	-0.673***	-0.168	1.315**
	(0.004)	(0.505)	(0.239)	(0.000)	(0.553)	(0.030)
Frequency	-0.024**	-0.049***	-0.056***	-0.008	-0.027***	-0.025***
	(0.030)	(0.002)	(0.003)	(0.354)	(0.005)	(0.007)
Tobin's Q	0.012	0.068**	0.107***	-0.146***	-0.078***	-0.014
	(0.621)	(0.041)	(0.005)	(0.000)	(0.001)	(0.474)
ROA	-1.960***	-0.774***	-0.609***	-1.473***	-0.985***	-0.782***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.004)
AT	0.399***	0.107	-0.036	0.422***	0.327***	0.217*
	(0.000)	(0.310)	(0.741)	(0.000)	(0.005)	(0.055)
Size	0.113***	0.087***	0.003	0.123***	0.077***	-0.060
	(0.000)	(0.001)	(0.948)	(0.000)	(0.003)	(0.303)
Dep	-0.889	0.223	0.277	-1.620***	-1.204***	-1.261***
	(0.107)	(0.646)	(0.571)	(0.000)	(0.009)	(0.010)
LM test	χ^2 (1) = 160.33***			χ^2 (1) = 124.87***		
Hausman test	χ^2 (6) = 0.49			χ^2 (6) = 5.34		
F / Wald χ^2	9.27***	45.95***	5.03***	60.31***	74.01***	4.07***
R^2	0.524	0.356	0.068	0.684	0.613	0.057
Observations	147	147	147	147	147	147

* Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

Table IX Effect of Value on Capital Structure

This table provides the regression results of relative volume on capital structure using alternative models (pooling regression, random effect model, and fixed effect model) and two measures of leverage (book and market). The Lagrangian Multiplier test (LM test) is used to test the random effect model versus the pooling regression. The Hausman specification test is used to test the fixed-effect model versus the random effect model. Regression standard errors are adjusted for heteroscedasticity. P-values are provided in parenthesis below the coefficient estimates. * Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

	Book leverage			Market leverage		
	Pooled	Random Effect	Fixed Effect	Pooled	Random Effect	Fixed Effect
Intercept	-0.642***	-0.367	0.494	-0.719***	-0.262	1.487***
	(0.002)	(0.218)	(0.451)	(0.000)	(0.342)	(0.009)
Value	-0.032**	-0.039***	-0.041***	-0.017**	-0.026***	-0.032***
	(0.012)	(0.007)	(0.007)	(0.032)	(0.001)	(0.004)
Tobin's Q	0.023	0.087**	0.126***	-0.142***	-0.063***	-0.028
	(0.360)	(0.035)	(0.006)	(0.000)	(0.008)	(0.196)
ROA	-1.827***	-0.688***	-0.517**	-1.376***	-0.921***	-0.843***
	(0.000)	(0.000)	(0.011)	(0.000)	(0.000)	(0.004)
AT	0.353***	0.091	-0.042	0.389***	0.306***	0.226**
	(0.000)	(0.388)	(0.713)	(0.000)	(0.009)	(0.046)
Size	0.121***	0.096***	0.019	0.129***	0.085***	-0.072
	(0.000)	(0.001)	(0.750)	(0.000)	(0.001)	(0.183)
Dep	-0.857	0.234	0.304	-1.573***	-1.194***	-1.278***
	(0.127)	(0.637)	(0.550)	(0.000)	(0.008)	(0.010)
LM test	χ^2 (1) = 156.14***			χ^2 (1) = 123.37***		
Hausman test	χ^2 (6) = 0.29			χ^2 (6) = 2.54		
F / Wald χ^2	10.04***	39.73***	4.08***	59.92***	77.62***	5.09***
R^2	0.537	0.398	0.128	0.691	0.641	0.032
Observations	147	147	147	147	147	147

* Significant at the 10% level, ** significant at the 5% level and *** significant at the 1% level.

Conclusion

In this paper, we analyze the relation between stock trading and capital structure on a sample of TSE-listed firms from 2000 to 2009. Using four measures of trading activity (volume, relative volume, frequency and value), we provide evidence that firms with more liquid stocks have a less leverage. Our finding is consistent with the results documented in Frieder and Martell (2006) and Lipson and Mortal (2009). This suggests that enhanced market trading activity reduces the required return on equity and thus the cost of issuing equity. Therefore, more liquid firms have more incentives to use equity financing when raising capital than debt.

References

Aitken, M. and Comerton-Forde, C. (2003) "How should liquidity be measured?" *Pacific-Basin Finance Journal*, Vol. 11, pp. 45-59.

Eckbo, E. and Norli, O. (2005) "Liquidity risk, leverage and long-run IPO returns" *Journal of Corporate Finance*, Vol. 11, pp. 1 – 35.

Barclay, kandel and Marx (1998), « The effects of transaction costs on stock prices and trading volume », Journal of Financial Economics, 34, 281-305.

Booth, L., Aivazian, V., Demirguc-Kunt, V., and Maksimovic, V. (2001) "Capital structures in developing countries" *Journal of Finance*, Vol. 56, pp. 87-130.

Breusch, T. and Pagan, A., (1980) "The Lagrange multiplier test and its applications to model specification in econometrics" *Review of Economic Studies,* Vol. 47, pp. 239–253.

Butler, A.W., Grullon, G. and Weston, J.P. (2005) "Stock market liquidity and the cost of issuing equity" *Journal of Financial and Quantitative Analysis*, Vol. 40, pp. 331–348.

De Angelo, H. and Masulis, R. (1980) "Optimal capital structure under corporate and personal taxation" *Journal of Financial Economics*, Vol. 8, pp. 3-29.

Demirgüçç-Kunt, A., Maksimovic, V. (1999) "Institutions, financial markets and firm debt maturity". *Journal of Financial Economics*, Vol. 54, pp. 295–336.

Eckbo and Norli (2005) "Liquidity risk, leverage and long-run IPO" *Journal of Corporate Finance*, Vol.11, pp. 1 – 35.

Céspedes Jacelly, Maximiliano González , Carlos A.(2010)," Ownership and capital structure in Latin America", Journal of Business Research 63, 248–254.

Jensen, M. and Meckling, W. H. (1976) "Theory of the firms: Managerial behavior, agency costs and ownership structure" *Journal of Financial Economics*, Vol. 3, pp. 305–360.

Lipson, M. L. and Mortal, S. (2009) "Liquidity and capital structure", *Journal of Financial Markets*, Vol. 12, pp. 611-644.

Modigliani, F. and Miller, M.H. (1958) "The cost of capital, corporation finance and the theory of investment" *The American Economic Review*, Vol. 48, pp. 261-297.

Rajan, G. R. and Zingales, L. (1995) "What do we know about capital structure? Some evidence from international data" *Journal of Finance*, Vol. 50, pp. 1421- 1460.

Titman, S., and Wessels, R. (1988), "The determinants of capital structure choice" *Journal of Finance*, Vol. 43, pp. 1-19.

Wald, J. K. (1999) "How firm characteristics affect capital structure: An international comparison" *Journal of Financial Research*, vol. 22, pp. 161-187.