# OWNERSHIP CONCENTRATION, EQUITY LIQUIDITY, AND CAPITAL STRUCTURE: A CASE STUDY ON NON-FINANCIAL FIRMS LISTED IN THE STOCK EXCHANGE OF THAILAND DURING YEARS 2001 - 2011

**Charnsid Leelakasemsant**
Martin de Tours School of Management and Economics, Assumption University

**Abstract**

Impacts of ownership concentration and equity liquidity on capital structure has received much attention in the literature. However, the combined effect of ownership concentration and equity liquidity on capital structure has been unexplored while the significant relationship between them has been documented in the literature. This study seeks to explore the combined effect of ownership concentration and equity liquidity on capital structure in the Thai context where, generally, ownership structure is highly concentrated and equity of firm is less liquid. The results show that the combined effect of ownership concentration and trading volume has a significant and negative effect on firm's leverage (in both non-crisis and crisis period). This implies that firms with relatively low concentrating in ownership and relatively high trading volume would use relatively low debt in their capital structure.

**Keywords:** Ownership Concentration, Equity Liquidity, Capital Structure, Thailand

**บทคัดย่อ**

การศึกษาเรื่อง ผลกระทบของอัตราส่วนของผู้ถือหุ้นรายใหญ่และสภาพคล่องของหุ้นต่อโครงสร้างทุน ได้รับความสนใจมากขึ้นในปัจจุบัน อย่างไรก็ตาม การศึกษาที่ผ่านไม่ได้คำนึงถึงผลกระทบร่วมของปัจจัยดังกล่าวต่อโครงสร้างทุนของบริษัท ดังนั้น งานศึกษานี้จึงศึกษาผลกระทบร่วมของความอัตราส่วนของผู้ถือหุ้นรายใหญ่และสภาพคล่องของหุ้นต่อโครงสร้างทุนของบริษัทในประเทศไทย ซึ่งมีโครงสร้างผู้ถือหุ้นและสภาพคล่องของหุ้นที่แตกต่างจากประเทศที่พัฒนาแล้ว ผลการศึกษาแสดงให้เห็นว่าผลกระทบร่วมของอัตราส่วนของผู้ถือหุ้นรายใหญ่และสภาพคล่องของหุ้นมีผลกระทบต่อโครงสร้างทุนอย่างมีนัยสำคัญ และมีผลในเชิงลบต่อสัดส่วนของหนี้ต่อทุนของบริษัท (ทั้งในภาวะปรกติและภาวะวิกฤต ทั้งนี้สรุปได้ว่า บริษัทที่มีอัตราส่วนของผู้ถือหุ้นรายใหญ่ที่ค่อนข้างต่ำและมีสภาพคล่องของหุ้นที่ค่อนข้างสูงจะมีสัดส่วนของการถือครองหนี้ ที่ค่อนข้างต่ำในโครงสร้างทุนของบริษัท

**คำสำคัญ:** อัตราส่วนของผู้ถือหุ้นรายใหญ่, สภาพคล่องของหุ้น, โครงสร้างทุน, ประเทศไทย

## INTRODUCTION

Since the seminal study of Modigliani and Miller in 1958, a number of empirical studies have attempted to model the relationship between various variables and capital structure. However, there is no general accepted single model to explain firm capital structure. For over five decades empirical results have demonstrated important factors as determinants of capital structure; for example, firm size, profitability, nature of assets held by firm, interest tax-shield, growth opportunities, business risk, and macroeconomic variables (Kester, 1986; Titman & Wessels, 1988; Wiwattanakantang,1999; Fama & French; 2002; Faulkender & Petersen; 2006; Al-Najjar & Taylor, 2008; Bastos, Nakamura & Basso, 2009; Frank & Goyal, 2009; Driffield & Pal, 2010; Gomes & Schmid, 2010; Goyal, Nova, & Zanetti, 2011; Udomsirikul et al., 2011; He & Xiong, 2012)

Recently, ownership structure and liquidity of firm equity have received attention in the study of capital structure. These two variables are closely related to the study of firm valuation. Ownership structure represents the wellness of firm's mechanism in monitoring and control over firm's mana-

gerial decisions. It also contributes to expected level of information asymmetry between firm's insiders and outsiders. While liquidity of firm equity represents confidence level of investors over firm's performance, trading activity of firm's equity, and impact of trading volume on firm value.

The two variables are also significantly related to capital structure. Specifically, the change of firm's ownership structure would affect firm's capital structure, as the major motivation of firm's owner to sell a fraction of his or her firm to outsiders or to raise funds externally (Jensen & Meckling, 1976). Liquidity of firm's equity also plays an important role in determining firm's capital structure. Literature documents that level of liquidity of firm's equity would affect the new equity issuance decision (Amihud, 2002). Prior studies suggest that cost of equity financing which is directly related to liquidity of firm's equity would be adjusted according to firm's equity liquidity (Amihud 1986, 2002; Sarin, Shastri, & Shastri, 2000; Frieder & Martell, 2006).

However, it is possible to question the empirical results of the impact of these variables on firm's capital structure documented in extant literature. Specifically, prior studies reported that firms with high ownership concentration have incentive to use less debt in their capital structure because the monitoring roles of debt are replaced by high level of ownership concentration (Heflin & Show, 2000; Sarin et al. 2000; Frieder & Martell, 2006). On the other hand, firms with high equity liquidity have incentive to use equity financing when they need fund due to relative low costs of equity issuance (Frieder & Martell, 2006; Rubin, 2007). These two scenarios lead to the same consequence of low leverage ratio presented in a firm's financial statement, which is somehow impossible. Generally, firms with high ownership concentration experience low level of equity liquidity. The position of firm's leverage will be questionable. By ignoring the correlation between ownership structure and liquidity of firm's equity, the empirical results might be misestimated. Therefore, this study aims to examining the combined effect of ownership structure and equity liquidity in order to clarify this capital structure puzzle.

In addition, this study also aims to compare the combined effect of ownership structure and equity liquidity on capital structure during non-crisis and crisis period. For doing so, data of non-financial Thai listed firms since 2001 to 2011 are used. The period of 2001 to 2007 is non-crisis period. The period of 2008 to 2011 is the period that Thailand was affected from the 2008/2009 Global Financial Crisis; therefore, this period is a crisis period.

## LITERATURE REVIEW

### Ownership Concentration and Capital Structure

Ownership concentration refers to the large block of shares owned by shareholder(s), in general at least 5 per cent of outstanding common stocks (Kester, 1986; Pindado & De La Torre, 2011). Normally, family members are large block holders in private firms while financial institutions such as mutual funds and pension funds or government are large block holders in publicly traded firms. Empirical evidence shows a positive relationship between ownership concentration and monitoring power of large shareholders over firm's management through their voting rights. They may replace senior managers including the Chief Executive Officer (CEO) and elect members of board of director. Thus, ownership concentration serves as an internal governance mechanism to reduce the probability of perquisite consumption by managers and board members (Ang, Cole, & Lin, 2000). Wiwattanakantang (1999) investigated the effect of ownership concentration on capital structure in Thailand. She found a negative relationship between ownership concentration and leverage. She argued that there is positive relationship between concentrated ownership and monitoring power. Specifically, firms with high concentrated ownership have lower level of management discretion. Therefore, debt is less favorable when firms have high ownership concentration.

Driffield, Mahambare and Pal (2007) examined the effect of ownership concentration on capital structure and firm value of four countries in East Asia using "Three Stage Least Square" (3SLS). Regardless of ownership characteristic, they found a positive relation between ownership concentration and leverage for Indonesia, Korea and Malaysia but found insignificant relationship for Thailand.

Ganguli (2010) investigated the relationship be-

tween ownership concentration and capital structure for non-financial Indian listed firms. He found a positive relation between ownership concentration and capital structure which is consistent with the major findings of Driffield et al. (2007). Based on prior empirical studies, the following hypothesis is developed

*Hypothesis 1:* There is a significant relationship between ownership concentration and leverage.

**Equity Liquidity and Capital Structure**

Empirical studies show that firm's equity is an important factor explaining changes of firm's capital structure (Adrian & Shin, 2010; Baker & Stein, 2004; Frieder & Martell, 2006; Lipson & Mortal, 2009; Udomsirikul et al., 2011; Welch, 2004). For example, Welch (2004) argued that equity returns explain about half of dynamic change in leverage over one-to-five years of time horizon.

Frieder and Martell (2006) examined the relationship between equity liquidity and leverage using panel data of all NYSE firms except financial and utility firms during 1988 to 1998. They argued that there is bi-directional relationship between equity liquidity and leverage. They reported a positive relation between leverage and equity liquidity. Firms with relatively high leverage have less liquidity premium (low bid-ask spread) and higher equity liquidity.

Lipson and Mortal (2009) studied the relationship between equity liquidity and leverage using panel data of all firms with data available on both CRSP and Compustat except financial and utility firms during 1985 to 2006. They contended that by trading off between the net cost of equity and the net cost of debt, firms can determine their optimal capital structure. They found a negative effect of leverage on equity liquidity as predicted by pecking order theory.

Udomsirikul et al. (2011) examined the relationship between equity liquidity and leverage using panel data of non-financial Thai firms listed on Stock Exchange of Thailand from 2002 to 2008. They used similar rationale as addressed in the study of Lipson and Mortal (2009) to bridge the relationship between equity liquidity and leverage. They found a negative relation between equity liquidity and leverage. Additionally, they include ownership concentration variable in their model. They argued that when firms have large shareholders with concentrated ownership, agency problems due to asymmetric information between managers and shareholders become less severe. They suggested that monitoring role of debt over manager's decision can be replaced by concentrated ownership. Thus, they contended that ownership concentration has a negative impact on leverage. However, they reported insignificant relation between ownership concentration and leverage. The results confirm a negative relationship between equity liquidity and leverage, consistent with Frieder and Martell (2006) and Lipson and Mortal (2009).

However, the Thai equity market is relatively less liquid compared to U.S. Udomsirikul et al. (2011) explain that relatively lower equity liquidity in Thailand is due to high ownership concentration. Thai firms are owned by block shareholders including banks, financial institutions, and family members who have strong relationship with banks or financial institutions. Thus, Thai firms rely mostly on bank loan as documented by relative high leverage in their study. Based on prior empirical studies, the hypothesis below is developed

*Hypothesis 2:* There is a significant relationship between equity liquidity and leverage.

**Ownership Concentration, Equity Liquidity, and Leverage**

The ultimate goal of this study is to test the interaction effect of ownership concentration and equity liquidity on leverage. There are empirical evidences document the relation between ownership concentration and equity liquidity. For example, Heflin and Shaw (2000), Sarin et al. (2000), and Rubin (2007) reported the negative effect of concentrated ownership on equity liquidity. They argued that controlling shareholders have incentive to access private or value-related information through their monitoring role over management decisions and firm's operating activities. Therefore, they argue that firms with high level of the ownership concentration tend to have severe adverse selection problems. They also argue that firms with high level of ownership concentration, regardless of type of ownership, have larger bid-ask spread or higher trading costs.

Prior studies show that Thai firms have concentrated ownership and less liquid equity (Udomsirikul et al., 2011). The current study ex-

tends prior studies by investigating the interaction effect of ownership concentration and equity liquidity on leverage. If controlling shareholders expropriate private or value-related information through their monitoring role, agency problems would increase because of information asymmetry between controlling shareholders and minority shareholders. Trading costs of equity are also expected to increase. Thus, there is less incentive to use equity financing and debt financing is more favorable in this situation. Based on these arguments, the following is posited

*Hypothesis 3:* There is a significant relationship between interaction of ownership concentration and equity liquidity and leverage.

Figure 1 conceptually presents the framework used in this study. The framework links ownership concentration, equity liquidity, and firm's leverage.

## DATA, MEASURE, AND METHODOLOGY

### Data Sources and Sample Selection

With respect to the objectives of this study, a panel data of publicly listed non-financial Thai firms over the period 2001 to 2011 are used. The initial sample comprises 394 non-financial firms listed on the Stock Exchange of Thailand over the period from 2001 to 2011. Since there have been firms listed, delisted, and non-active (no return and volume data) in the sample period, the data set used in this study is unbalanced panel data.

Lipson and Mortal (2009) argued that firm's equity should have active trading day (trading day that has both stock return and volume data) for more than 50 days during the year. In order to make a measure of liquidity more reliable, this study follows their suggestion. Consequently, there are 349 firms satisfying all requirements and have minimum of two consecutives firm-year observations from 2001 to 2011, while 45 firms have incomplete data. The sample is then reduced to those firms report active trading days of at least 50 days during the year, which leaves 2,455 firm-year observations for data analysis.

Financial and accounting data are retrieved from Bloomberg. Ownership structure data is manually collected from the information disclosure report (FORM 56-1) available on SETSMART.

### Dependent Variable

The measure of leverage used in this study follows Wiwattanakantang (1999). Leverage (LV) is defined as ratio of book value of debt to market value of assets

$$LV_{i,t} = \frac{D_{i,t}}{V_{i,t}}$$

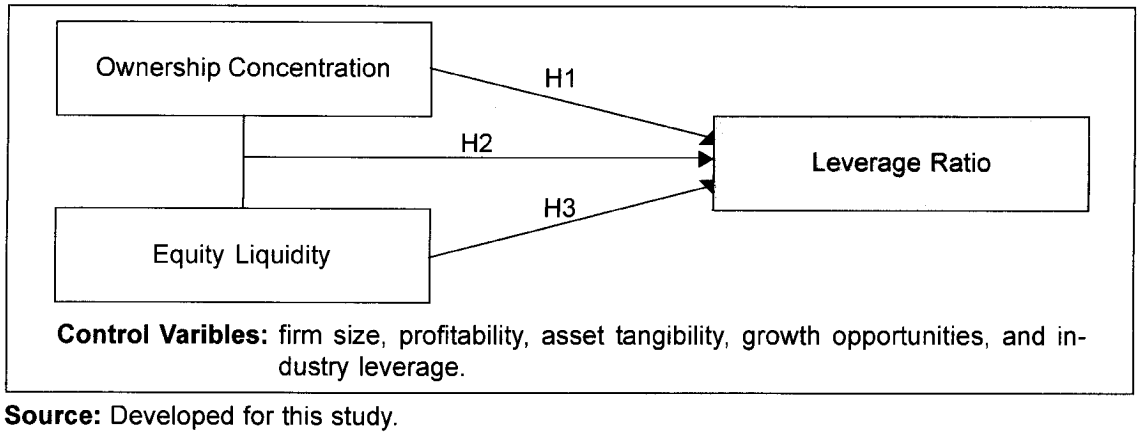
where

$D_{i,t}$ is total debt of firm *i* at the end of year *t*,

$V_{i,t}$ is market value of assets of firm *i* at the end of year *t*.

Total debt includes bank overdrafts and loans from financial institutions, current portion of long-term liabilities, debentures, convertible debentures, and long-term liabilities. Market value of assets is defined as the summation of book value of total liabilities and market value of total equity (a product of number of outstanding shares and year-ended closing price).

**Figure 1: Conceptual Framework of the Study**




**Source:** Developed for this study.

## Independent Variables

*Ownership Concentration*

Ownership concentration (CON) is defined as the percentage of common shares owned by five largest shareholders presented in FORM 56-1 as suggested by Driffield et al. (2007).

*Equity Liquidity*

There are three definitions of equity liquidity used in this study, i.e., Amihud's (2002) illiquidity, trading volume, and turnover.

Measure of equity liquidity suggested by Amihud (2002) is used in this study, namely Amihud's (2002) illiquidity (ILLQ). It is defined as a ratio of daily absolute equity return to trading volume in Thai baht, averaged by number of trading days. ILLQ serves as a rough measure of price impact. Specifically, ILLQ offers the daily price response to one baht of trading volume. Calculation of Amihud's (2002) illiquidity is presented as follows:

$$ILLQ_{iy} = \frac{1}{Day_{iy}} \cdot \sum_{t=1}^{Diy} \frac{|Return_{iyd}|}{Volume_{iyd}}$$

where:

$Return_{iyd}$ is the daily return on stock $i$ on day d of year $y$,

$Volume_{iyd}$ is the daily trading volume in baht for stock $i$ on day d of year $y$, and

$Day_{iy}$ is the number of trading days when data are available for stock $i$ in year $y$.

ILLQ requires daily data on equity return and trading volume while other measures require intra-day transaction data (Amihud & Mendelson, 1986). Even though ILLQ is less accurate compared to other measures, which require microstructure data (i.e. bid-ask spread); it can be constructed by a long time series of daily equity data. It also provides the possibility for the study in the market where intra-day transaction data is difficult to be accessed (Amihud, 2002).

Another two alternative measures are trading volume and turnover (Rubin, 2007). Trading volume (VOL) refers to annual trading share volume. Turnover (TO) refers to annual trading share volume divided by the number of shares outstanding at the end of the year. These alternative measures of equity liquidity represent the trading activity in a given share in a given period. They also provide robustness check for the current study.

## Control Variables

Natural log of total assets is used as a proxy for firm size (SIZE) as suggested by Udomsirikul et al. (2011). A ratio of earnings before interest and taxes (EBIT) to total assets is used as a proxy for profitability (PROF) as suggested by Udomsirikul et al. (2011). A ratio of net property, plant, and equipment to total assets is used as a proxy for asset tangibility (ASTA) as suggested by Udomsirikul et al. (2011). A ratio of market value of assets to book value of assets is used as a proxy for growth opportunities (GROP) as suggested by Udomsirikul et al. (2011). Median of total debt to market value of asset classified by industry and by year is used as a proxy for median industry leverage (MEIL) as suggested by Frank and Goyal (2009).

Table 1 shows the descriptive statistics for dependent, independent, and control variables for the entire, crisis, and non crisis periods. It reports the mean, median, standard deviation, maximum, and minimum for the variables. Panel A of Table 1 shows summary statistics of full sample period while Panel B and C show information of each variable for non crisis period (2001-2007) and crisis period (2008 - 2011), respectively.

# EMPIRICAL FINDINGS AND DISCUSSION

## Regression Analysis

To test hypotheses 1 to 3, the combined effect of ownership concentration and equity liquidity on leverage is examined by regressing leverage (LV) against ownership concentration (CON), one-year lagged of measure of equity liquidity (LQMt-1), interaction of ownership concentration and measure of equity liquidity (CON*LQMt), and control variables:

$$LV_{i,t} = C + \beta_0 LQM_{i,t-1} + \beta_1 CON_{i,t-1} + \beta_2 (CON_{i,t} * LQM_{i,t} + \beta_3 SIZE_{i,t-1} + \beta_4 PROF_{i,t-1} + \beta_5 ASTA_{i,t-1} + \beta_6 GROP_{i,t-1} + \beta_7 MEIL_{i,t-1} + \eta_t + \kappa_i + \mu i,t$$

Prior studies suggest that panel data normally contain heteroskedasticity serial correlation, random effects, fixed effects, and endogeneity. The first two problems are remedied by White period - a method option built into Eviews. White period

**Table 1: Descriptive Statistics**

| | Panel A<br>2001 - 2011 (2,455 firm-year observations) | | | | |
|---|---|---|---|---|---|
| | **Mean** | **Median** | **Maximum** | **Minimum** | **Std. Dev.** |
| LV | 0.237 | 0.202 | 0.950 | 0.000 | 0.207 |
| ILLQ(-1) | 171.474 | 5.166 | 8,917.888 | 0.001 | 604.346 |
| VOL(-1) (Million Shares) | 1,726.883 | 182.296 | 415,606.012 | 0.032 | 12,467.827 |
| TO(-1) | 1.303 | 0.386 | 134.774 | 0.000 | 4.121 |
| CON | 0.636 | 0.649 | 1.000 | 0.038 | 0.184 |
| SIZE(-1) | 3.599 | 3.495 | 6.090 | 2.166 | 0.621 |
| PROF(-1) | 0.062 | 0.061 | 0.677 | -0.546 | 0.098 |
| ASTA(-1) | 0.392 | 0.389 | 1.313 | 0.001 | 0.231 |
| GROP(-1) | 1.239 | 1.050 | 15.618 | 0.176 | 0.763 |
| MEIL(-1) | 0.218 | 0.204 | 0.820 | 0.001 | 0.132 |
| | | | | | |
| | **Panel B**<br>**2001 - 2007 (1,233 firm-year observations)** | | | | |
| | **Mean** | **Median** | **Maximum** | **Minimum** | **Std. Dev.** |
| LV | 0.239 | 0.208 | 0.950 | 0.000 | 0.206 |
| ILLQ(-1) | 88.894 | 5.174 | 3,528.459 | 0.001 | 284.255 |
| VOL(-1) (Million Shares) | 1,722.250 | 166.404 | 375,726.800 | 0.065 | 12,368.508 |
| TO(-1) | 1.261 | 0.429 | 32.830 | 0.000 | 2.523 |
| CON | 0.642 | 0.647 | 1.000 | 0.038 | 0.183 |
| SIZE(-1) | 3.560 | 3.446 | 5.877 | 2.187 | 0.612 |
| PROF(-1) | 0.070 | 0.068 | 0.564 | -0.420 | 0.087 |
| ASTA(-1) | 0.411 | 0.407 | 1.313 | 0.003 | 0.225 |
| GROP(-1) | 1.276 | 1.078 | 12.856 | 0.176 | 0.772 |
| MEIL(-1) | 0.232 | 0.212 | 0.820 | 0.001 | 0.135 |
| | | | | | |
| | **Panel C**<br>**2008 - 2011 (1,222 firm-year observations)** | | | | |
| | **Mean** | **Median** | **Maximum** | **Minimum** | **Std. Dev.** |
| LV | 0.234 | 0.195 | 0.868 | 0.000 | 0.208 |
| ILLQ(-1) | 253.382 | 5.144 | 8,917.888 | 0.001 | 798.732 |
| VOL(-1) (Million Shares) | 1,731.558 | 200.047 | 415,606.012 | 0.032 | 12,572.308 |
| TO(-1) | 1.345 | 0.347 | 134.774 | 0.000 | 5.263 |
| CON | 0.630 | 0.651 | 1.000 | 0.054 | 0.185 |
| SIZE(-1) | 3.639 | 3.530 | 6.090 | 2.166 | 0.625 |
| PROF(-1) | 0.054 | 0.055 | 0.677 | -0.546 | 0.107 |
| ASTA(-1) | 0.371 | 0.361 | 0.974 | 0.001 | 0.234 |
| GROP(-1) | 1.201 | 1.020 | 15.618 | 0.295 | 0.753 |
| MEIL(-1) | 0.204 | 0.193 | 0.577 | 0.001 | 0.126 |

method assumes that the errors for a cross-section are heteroskedastic and serially correlated. Random and fixed effects are examined. Results (not tabulated) suggest that two-ways fixed effects models are appropriate for panel regression analysis. Therefore, year ($\eta_t$) and firm ($\kappa_i$) fixed effects are controlled.

Table 2 contains the results of the model where leverage ratio (LV) is regressed against ownership concentration (CON), equity liquidity measure (LQM), interaction of ownership concentration and equity liquidity measure, and control variables in accordance with regression equation (1). Panel A, B, and C on Table 2 present empirical results for crisis period (2001-2007), non crisis period (2008-2011), and full sample period (2001-2011), respectively. Each equity liquidity measure is presented at the top of the column. (-1) denotes one-year lagged in which these variable are measured. Panel A, B, and C present empirical results for non crisis period (2001-2007), crisis period (2008-2011), and full sample period (2001-2011), respectively. P-values are in parentheses. *, **, *** denote significance at the 10, 5, and 1 per cent level, respectively.

Hypothesis 1: The coefficients of ownership concentration are negative and significant for all measures of equity liquidity in non-crisis period and full sample period.

This finding aligns with prior studies which contend that ownership concentration can reduce agency problem through its effective monitoring

**Table 2: Regression Results (Note: Number in the parentheses are the p-values. *, **, *** significant at the 10, 5, and 1 per cent level, respectively.)**

| | Panel A | | | Panel B | | | Panel C | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Period** | **2001 - 2007** | | | **2008 - 2011** | | | **2001 - 2011** | | |
| | Dependent Variable: Leverage Ratio | | | Dependent Variable: Leverage Ratio | | | Dependent Variable: Leverage Ratio | | |
| Constant | -0.8113*** | -0.8072*** | -0.7667*** | -0.4064** | -0.4487** | -0.3949** | -0.7832*** | -0.7881*** | -0.7796*** |
| | (0.0000) | (0.0000) | (0.0000) | (0.0318) | (0.0116) | (0.0354) | (0.0000) | (0.0000) | (0.0000) |
| Liquidity Measure (-1): | | | | | | | | | |
| Amihud (2002) | -0.000005 | | | 0.000005 | | | -0.0000005 | | |
| Illiquidity | (0.8090) | | | (0.3954) | | | (0.9098) | | |
| Treding Volume | | -0.000008 | | | -0.0000010 | | | -0.0000006 | |
| | | (0.6541) | | | (0.3350) | | | (0.5914) | |
| Turnover | | | -0.0069** | | | 0.0001 | | | -0.0009 |
| | | | (0.0170) | | | (0.9221) | | | (0.4565) |
| CON | -0.0666* | -0.0640* | -0.0779 | -0.0596 | -0.0488 | -0.0532 | -0.0569** | -0.0489* | -0.0571** |
| | (0.0591) | (0.0675) | (0.0306) | (0.1727) | (0.2637) | (0.2136) | (0.0451) | (0.0846) | (0.0454) |
| Liquidity Measure*CON | | | | | | | | | |
| *Amihud (2002) | 0.0001* | | | 0.000009 | | | 0.000006 | | |
| Illiquidity | (0.0731) | | | (0.2466) | | | (0.4224) | | |
| *Trading Volume | | -0.000007** | | | -0.000007*** | | | -0.000006*** | |
| | | (0.0306) | | | (0.0053) | | | (0.0020) | |
| *Turnover | | | -00014 | | | -0.0049 | | | 0.0004 |
| | | | (0.7014) | | | (0.3496) | | | (0.8814) |
| SIZE (-1) | 0.2865*** | 0.2869*** | 0.2809*** | 0.1696*** | 0.1818*** | 0.1672*** | 0.2676*** | 0.2690*** | 0.2671*** |
| | (0.0000) | (0.0000) | (0.0000) | (0.0008) | (0.0001) | (0.0008) | (0.0000) | (0.0000) | (0.0000) |
| PROF (-1) | -0.4144*** | -0.4295*** | -0.4517*** | -0.0690 | -0.0713 | -0.0728 | -0.3389*** | -0.3377*** | -0.3460*** |
| | (0.0000) | (0.0000) | (0.0000) | (0.2823) | (0.2631) | (0.2645) | (0.0000) | (0.0000) | (0.0000) |
| ASTA (-1) | 0.1229* | 0.1190* | 0.1125* | 0.0121 | 0.0112 | 0.0125 | 0.1254*** | 0.1230*** | 0.1249*** |
| | (0.0512) | (0.0541) | (0.0654) | (0.7289) | (0.7495) | (0.7224) | (0.0000) | (0.0000) | (0.0000) |
| GROP (-1) | 0.0012 | 0.0019 | 0.0028 | 0.0034 | 0.0033 | 0.0039 | 0.0021 | 0.0021 | 0.0020 |
| | (0.8123) | (0.7088) | (0.5923) | (0.5104) | (0.4757) | (0.4257) | (0.5075) | (0.4843) | (0.5163) |
| MEIL (-1) | 0.1827*** | 0.1903*** | 0.1765*** | 0.2612*** | 0.2719*** | 0.2564*** | 0.2689*** | 0.2768*** | 0.2683*** |
| | (0.0010) | (0.0005) | (0.0012) | (0.0001) | (0.0000) | (0.0001) | (0.0000) | (0.0000) | (0.0000) |
| Number of Observation | 1191 | 1188 | 1188 | 1193 | 11983 | 1192 | 2384 | 2381 | 2378 |
| Adjusted R-Squared | 0.8011 | 0.8010 | 0.8026 | 0.8340 | 0.8340 | 0.8344 | 0.7789 | 0.7808 | 0.7784 |
| F-test | 17.1898*** | 17.1996*** | 17.3563*** | -18.2108*** | 18.2108*** | 18.2488*** | 23.9995*** | 24.2898*** | 23.9614*** |
| Prob (F-statistic) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Year Dummy | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm Dummy | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

role over the management decisions (Admati, Pfleiderer & Zechner, 1994; Frieder & Martell, 2006; Lipson & Mortal, 2009; Polsiri, 2004; Wiwattanakantang, 1999, 2001). The presence of ownership concentration can replace the benefit of debt financing with regard to its monitoring function over management decisions to reduce agency problems. In other words, the monitoring roles of debt and ownership concentration are substitutes. Therefore, firms with concentrated ownership tend to use less debt in their capital structure.

Hypothesis 2: The coefficients of measures of equity liquidity are negative and significant when trading volume and turnover are used as a measure of equity liquidity. The significant relationship between equity liquidity and leverage exists only for non crisis period.

These results imply that firms with low trading activity tend to have less liquid equity and high agency costs. Thus, relatively low level of equity liquidity increases agency costs of equity and increases the relative advantage of debt financing; hence, firms with relatively low equity liquidity tend to have high leverage.

Hypothesis 3: The coefficients of interaction of trading volume and ownership concentration are negative and significant in non crisis, crisis, and full sample periods. The coefficient of interaction of Amihud's (2002) illiquidity measure and ownership concentration is positive and significant in non crisis period.

Thus, the results show that there is significant relationship between impact of interaction of ownership concentration and equity liquidity on capital structure decision. Therefore, hypothesis 3 is supported.

## CONCLUSION

With respect to objectives of the study, three research objectives are accomplished. Specifically, the impacts of ownership structure, equity liquidity, and interaction of ownership structure and equity liquidity on capital structure are fully examined and empirical results are reported. The results suggest that ownership concentration can replace the benefit of debt financing with regard to its monitoring function over management decisions to reduce agency problems.

In other words, the monitoring roles of debt and ownership concentration are substitutes. Therefore, firms with concentrated ownership tend to use less debt in their capital structure.

The ultimate objective of this study is to examine the interaction effect of ownership structure and equity liquidity on capital structure decision. The results provide additional evidence to capital structure literature. There is significant relationship between interaction of ownership structure and equity liquidity. This extends the existing knowledge of the role of liquidity of firm's equity and ownership structure in explaining firm's leverage. Specifically, equity liquidity significantly moderates the relationship between ownership structure and capital structure as predicted.

This study also aims to examine the effect of ownership structure and equity liquidity on capital structure decision during non crisis period of 2001 to 2007 and period of Global Economic Crisis of 2008 to 2011. The results show that impact of interaction of ownership concentration and equity liquidity on capital structure exists only in non crisis period.

Additionally, firm size, profitability, asset tangibility, and industry leverage significantly explain firm's leverage, while there is no significant relation between growth opportunities and leverage in this study.

## References


Admati, A. R., Pfleiderer, P., & Zechner, J. (1994). Large Shareholder Activism, Risk Sharing, and Financial Market Equilibrium. *Journal of Political Economy, 102*(6), 1097-1130.

Adrian, T., & Shin, H. S. (2010). Liquidity and leverage. *Journal of Financial Intermediation, 19*(3), 418-437.

Al-Najjar, B., & Taylor, P. (2008). The Relationship between Capital Structure and Ownership Structure: New Evidence from Jordanian Panel Data. *Managerial Finance, 34*(12), 919-933.

Amihud, Y.,& Mendelson, H. (1986). Asset Pricing and the Bid-ask Spread. *Journal of Financial Economics, 17*(2), 223-249.

Amihud, Y. (2002). Illiquidity and Stock Returns: Cross-section and Time-series Effects. *Journal of Financial Markets, 5*(1), 31-56.

Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency Costs and Ownership Structure. *The Journal*

*of Finance, 55*(1), 81-106.

Bastos, D. D., Nakamura, W. T., & Basso, L. F. C. (2009). Determinants of Capital Structure of Publicly-Traded Companies in Latin America: The Role of Institutional and Macroeconomic Factors. *Journal of International Finance & Economics, 9*(3), 24-39.

Driffield, N., Mahambare, V., & Pal, S. (2007). How Does Ownership Structure Affect Capital Structure and Firm Value? E*conomics of Transition, 15*(3), 535-573.

Fama, E. F., & French, K. R. (2002). Testing Trade-Off and Pecking Order Predictions About Dividends and Debt. *Review of Financial Studies, 15*(1), 1-33.

Faulkender, M., & Petersen, M. A. (2006). Does the Source of Capital Affect Capital Structure? *The Review of Financial Studies, 19*(1), 45-79.

Frank, M. Z., & Goyal, V. K. (2009). Capital Structure Decisions: Which Factors Are Reliably Important? *Financial Management, 38*(1), 1-37.

Frieder, L., & Martell, R. (2006). On Capital Structure and the Liquidity of Firm's Stock. *Working Paper,* SSRN eLibrary.

Ganguli, S. K. (2010). Does Ownership Structure Matter? Theory and Indian Evidence. *Working Paper,* SSRN eLibrary.

Gomes, J. F., & Schmid, L. (2010). Levered Returns. The Journal of Finance, 65(2), 467-494.

Goyal, V. K., Nova, A., & Zanetti, L. (2011). Capital Market Access and Financing of Private Firms*. *International Review of Finance, 11*(2), 155-179.

He, Z., & Xiong, W. E. I. (2012). Rollover Risk and Credit Risk. *The Journal of Finance, 67*(2), 391-430.

Heflin, F., & Shaw, K. W. (2000). Blockholder Ownership and Market Liquidity. *The Journal of Financial and Quantitative Analysis, 35*(4), 621-633.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics, 3*(4), 305-360.

Kester, W. C. (1986). Capital and Ownership Structure: A Comparison of United States and Japanese Manufacturing Corporations. *Financial Management, 15*(1), 5-16.

Lipson, M. L., & Mortal, S. (2009). Liquidity and Capital Structure. *Journal of Financial Markets, 12*(4), 611-644.

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review, 48*(3), 261-297.

Pindado, J., & De La Torre, C. (2011). Capital Structure: New Evidence from the Ownership Structure*. *International Review of Finance, 11*(2), 213-226.

Polsiri, P. (2004). Concentrated ownership and firm responses to a crisis: Evidence from Thailand. *Working Paper,* SSRN eLibrary.

Rubin, A. (2007). Ownership Level, Ownership Concentration and Liquidity. *Journal of Financial Markets, 10*(3), 219-248.

Sarin, A., Shastri, K. A., & Shastri, K. (2000). Ownership Structure and Stock Market Liquidity. *International Journal of Accounting, 38,* 465-491.

Titman, S., & Wessels, R. (1988).The Determinants of Capital Structure Choice. *The Journal of Finance, 43*(1), 1-19.

Udomsirikul, P., Jumreornvong, S., & Jiraporn, P. (2011). Liquidity and Capital Structure: The Case of Thailand. *Journal of Multinational Financial Management, 21*(2), 106-117.

Welch, I. (2004). Capital Structure and Stock Returns. *The Journal of Political Economy, 112*(1), 106-132.

Wiwattanakantang, Y. (1999). An Empirical Study on the Determinants of the Capital Structure of Thai Firms. *Pacific-Basin Finance Journal, 7*(3-4), 371-403.

Wiwattanakantang, Y. (2001). Controlling Shareholders and Corporate Value: Evidence from Thailand. *Pacific-Basin Finance Journal, 9*(4), 323-362.

**About the Author:**

**Charsnsid Leelakasemsant** has a PhD in Business Administration, with a concentration in Finance, from the Martin de Tours School of Management and Economics, Assumption University. He can be reached at charnsid@gmail.com and charnsid@hotmail. com.