#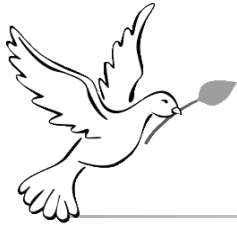 Relationship between Capital Structure and Abnormal Returns: An Empirical Evidence of the Listed Companies in the Stock Exchange of Thailand*

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Abstract

This applied research aims to examine the relationship between capital structure and abnormal return by using the listed companies in the Stock Exchange of Thailand as empirical evidences. This research gathered data from SETSMART database during the 5-years study period from 2013 to 2017. The capital structure and abnormal return were measured by using the total debt to equity ratio and the Capital Asset Pricing Model, respectively. The controlled variables included size, price to earning ratio, price to book value ratios, beta, return on asset, and the average saving rate of the big 4 banks. Then, the relationship was analyzed by using fixed effects regression.

The research revealed that the listed companies in the Stock Exchange of Thailand during 2013-2017 had the average debt to equity ratio at 1.482 times, and the average abnormal return was -0.207 percent annually. There existed the significant negative relationship between capital structure and abnormal return with a correlation coefficient of -0.026. This implied that the effect of bankruptcy dominates tax benefit. Additionally, price to earning and price to book value ratios are significantly negatively correlated with abnormal return, signifying correlation coefficients of -0.005 and -0.012, respectively. Therefore, the securities having low total debt to equity ratio, price to earning ratio, price to book value ratio are recommended.

Keywords: Capital Structure; Abnormal Return; The Stock Exchange of Thailand

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Introduction

The funding sources are considered as important factors in business operations for business expansion, development and increasing future growth opportunities. The source of fund from the owner is one past of financing in the business and owner hopes for dividend return (Grinblatt, 1989). Anyway, funding sources from loans are the sources of money that the owner lends and hopes for compensation from interest and the borrower must repay the principal according to the period specified by the so-called "Capital Structure" (Modigliani and Miller, 1963). That is, companies or businesses will be able to raise funds for use in a variety of ways, such as borrowing money from banks and other financial institutions or even able to issue debt instruments, equity securities, etc. The executives who are representatives of business owners are responsible for making decisions about financing which is considered as an important duty of the management because the financing decision will directly affect the liabilities and equity proportion of total liabilities (short-term and long-term). The owner's part is called the financial structure, while financing, long-term liabilities and owners' equity are called capital structures. The capital structure must be considered before deciding whether to fund what formats and what proportion because the weighted average cost of capital that has occurred has an effect on the creation of business value. (Pimpat, 2011)

Considering investors, abnormal return in generally preferable. Under the efficient market hypothesis, the stock price reflects all available information immediately. As a result, there is no investor who can make abnormal return, or it can be said that investors will receive returns based on the "risks" of investment, but in the real world of investment, most investors would like to invest in high investment securities. This high return can be seen from changes in stock prices which investors are expecting to receive a profit from the capital gain that is bought and sold at the highest value possible (Jenwittayaroje,2018). Since it cannot confirm the efficient capital market from empirical evidence, inefficient capital market shield exists. Consequently, there is a chance for gaining abnormal returns.

Even though capital structure affects business value which consequently results in investor's returns. The research related to the relationship between capital structure and abnormal return is limited. It was found that there are foreign researches, such as (Muradoglu and Sivaprasad,2012; Al-Shubiri,2010). However such research has not yet found in Thailand. From the importance and research involved above, the researcher therefore is interested in examine whether the relationship between capital structure and abnormal returns is related and in any direction in an empirical evidence of the listed companies in the Stock Exchange of Thailand.

Research Objective

The main objective of this research is to examine the relationship between capital structure and abnormal returns of the listed companies listed in the Stock Exchange of Thailand.

Theoretical Background and Previous Studies

Theories of capital structure include Modigliani and Miller, Trade-off theory, signaling, pecking order theory and efficient market hypothesis as follows; the capital structure theory of studied by Modigliani and Miller in 1958. The theory and conclusions about capital structure in two ways that are without and with income taxes. (Modigliani and Miller,1958) concluded that in the world without taxes, the value of firm is unaffected by its capital structure. Adding debts into the capital structure will not be able to increase the value of the business as well. The benefits of low-cost indebtedness will be compensated by the increased cost of ownership. Next, (Modigliani and Miller,1963). added corporate taxes in their model. The shield on tax,

ductility from debt financing increase firm value and hence reduces the cost of capital. M and M' model will be reduced tax benefit of debt financing (Pongsupatt, 2011).

Even though capital structure with debt financing create firm value by tax shield suggested by M and M, business dose not incur a lot of debt in order to expect a tax shield. According to the Trade-off theory which taking into account the financial costs and tax benefits that arise from debt formation explained the relevance between the assets structure of the business and determining the appropriate capital structure for the original debt ratio. (Banz,1981) M and M's assumption is the executives and investors receive similar information about business trends. However, in reality, executives have more information than investors, so if the management announces more dividends than investors anticipate, it is therefore a signal that the price of the ordinary shares will increase. The way that the share price is increased is caused by the awareness of the investors about this information, not about satisfying with receiving dividends in anyway. However, if increasing the dividend payment is due to the lack of investment projects, the market may respond in the opposite direction, that is, the price of shares may decrease after the declaration of dividend payment (Jensen and Meckling, 1976). On the other hand, if there is a declining dividend announcement payment happening because the company has an interesting investment project, therefore paying a low dividend to collect retained earnings in order to continue to increase the value in the future or investors may be considered a signal from the management that future profits will decrease. Therefore, the signal of the management will be able to access the information better than the investors. The above refers to Signaling Theory. Consequence of Signaling Theory is Pecking Order Theory. Pecking Order theory indicates that the business will have a sequence of choosing to use funds as follows: 1) Internal generated fund including retained earnings and Marketable Securities and 2) external generated fund including debt securities, preferred stock and common stock. Internal fund is firstly selected to prevent signaling. Next, debt financing is preferred as positive signal. The last choice is common stock due to negative signal.

The Capital Asset Pricing Model (CAPM) describes the relationship between systematic risk and expected return for assets, particularly stocks. The formula for calculating the expected return of an asset given its risk is as follows: $ERi = Rf + (ERm - Rf) BETAi$ where ERi = Expected return of investment, Rf = Risk-free rate, $BETAi$ = Beta of the investment, ERm = Expected return of market, and $(ERm - Rf)$ = Market risk premium. CAPM is widely used throughout finance for pricing risky securities and generating expected returns for assets given the risk of those assets and cost of capital. Investors expect to be compensated for risk and the time value of money. The risk-free rate in the CAPM formula accounts for the time value of money. The other components of the CAPM formula account for the investor taking on additional risk. The beta of a potential investment is a measure of how much risk the investment will add to a portfolio that looks like the market (Roll and Ross,1980). Efficient Market Hypothesis (EMH) states that the securities will reflect the information quickly and all investors can receive that information at the same time. Moreover, they will also respond to that message with the same understanding, making it impossible to generate the abnormal returns. All information is already in the stock price. In the powerful market characteristics like this, all securities prices are equal to the intrinsic value. However, in the real world there exists a symmetric information in capital market resulting in market inefficiency. Therefore, there is a chance for abnormal.

According to the examinations of documents related to capital structure: factors determining the appropriate capital structure of the listed companies in the ASEAN market including 5 countries, namely Thailand, Malaysia, Singapore, Indonesia and Philippines (Sakchawajit,2016) and The relationship between capital structure and value of firm (Niresh,2012), they were found that most of the theories studied are capital structure theories of Modigliani-Miller, Trade-off Theory, Pecking Order Theory as well as Signaling Theory.

From the examinations of documents related to the excessive rate of return, An analysis of investment strategies and abnormal returns in the Vietnam stock market (Chin and Hieu,2015) , Impact of corporate governance score on abnormal returns of mergers and acquisitions (Neelam Rani,2013). The relationship between abnormal returns and social and environmental responsibility: An empirical study of companies traded on the Bovespa from 1999 to 2006 (Mossa et al, 2009). Firm characteristics and long-run abnormal returns after IPOs: a Jordanian financial market experience (Shawawreh and Tarawneh , 2015), we found that the theory mostly studied is Market Efficient Hypothesis.

The relationship between capital structure and abnormal return is not widely studied. (Lisboa,2015). investigates large Portuguese firms and finds that abnormal return is determined by capital structure. The negative relationship was found in three capital markets. In Jordan, Nasif (2010) finds that abnormal return is negatively affected by capital structure. Similarity, (Muradoglu and Sivaprasad,2012). finds such negative relationship in London Stock Exchange, their results show that abnormal return decline in firm leverage. Moreover, (Ullah and Shah,2014). provide evidence of a negative effect of capital structure and abnormal return in Pakistan.

Conceptual Framework for Research

From the study of concepts, theories and related researches, this research has a conceptual framework as shown in Figure 1.
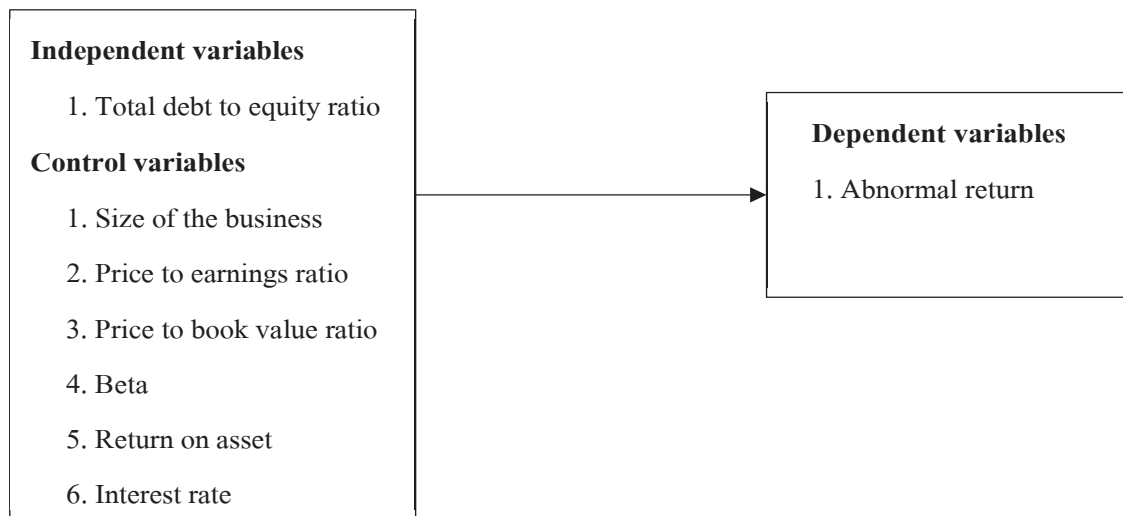

Figure 1 Conceptual Framework for Research

Research Hypotheses

According to the above conceptual framework, this research has seven hypotheses as follows;

Hypothesis 1: The total debt to equity ratio is negatively correlated with the abnormal return.

Hypothesis 2: The size of the company is negatively correlated with the abnormal return.

Hypothesis 3: The price-to-earnings ratio of shares is negatively correlated with the abnormal return.

Hypothesis 4: The share price ratio per book value per share is negatively correlated with the abnormal return.

Hypothesis 5: The beta are positively correlated with the abnormal return.

Hypothesis 6 : The return on investment property is positively correlated with the abnormal return.

Hypothesis 7. The interest rates are negatively correlated with the abnormal return.

Research Methodology

Data Collection and Sample Selection

This research collected secondary data include total debt to equity ratio, stock price, company size, price to earnings ratio, price to book value ratio, return on assets and beta. From annual financial statements in the year 2013-2017 from www.setsmart.com and www.set.or.th. Additionally, the one-month treasury yield and the average interest rate of 4 banks, including Bangkok Bank, Thai Commercial Bank, Limited, Krung Thai Bank Public Company Limited and Kasikorn Bank collecting data from www.bot.or.th.

The population of this study is the companies listed in the Stock Exchange of Thailand, except the financial group, which composes of 487 companies (as of December 12, 2018). Then, (Yamane,1973) is used to calculate a sample, resulting in 220 companies. Such samples are selected from the most active volume of shares in each industry.

Data Analysis

Fixed-Random Effects Regression Analysis is used to test the relationship between capital structure and abnormal return. The reason of using such a method because the testing from the Hausman Test equation found that the value of Prob. is 0.0489 which is less than 0.05. Hence, the Fixed Effect Regression method is more appropriate than the Random Effect Regression method. Data are analyzed as follows;

Dependent Variable

Dependent variable is Abnormal Return (AR) calculated as the difference between return and expected return based on the Capital Asset Pricing Model (CAPM) as follows;

$$AR_{it} = R_{it} - E(R)_{it}$$

Where

AR_{it} is the abnormal return of stock i on the day of t.

R_{it} is the return of stock i on the day of t.

$E(R)_{it}$ is the expected return of stock i on the day t.

Return of stock i is rate of return on dividend and capital gain calculated as;

$$R_{it} = \frac{D_{it} + P_{it} - P_{it-1}}{P_{it-1}}$$

Where

R_{it} is the rate of return of stock i on the day of t.

D_{it} is the dividend of stock i on the day t.

P_{it} and P_{it-1} are the closing stock price on the day t and t-**1.**

The expected rate of return of stock is based on the CAPM as;

$$E(R)_{it} = R_{ft} + [E(R)_{mt} - R_{ft}]beta$$

Where

R_{ft} is the risk-free rate using 1-month Treasury Bill yield.

$E(R)_{mt}$ is the market return calculated by the change in the SET index.

Beta   is the market risk specified by the SET (www. setsmart.com)

Then, cumulative abnormal return (CAR_{it}) is computed to find the annual abnormal return for each stock. This aggregates the abnormal returns to find the cumulative abnormal return at year t as the year 2013, 2014, 2015, 2016, and 2017.

$$CAR_{i,t} = \sum_{t=1}^{n} AR_{it}$$

Independent Variable

The independent variable used in this research is the total debt to equity ratio (DE) which is used to measure the capital structure.

$$DE_{it} = \frac{Total\ debt_{it}}{Shareholders'equity_{it}}$$

Control Variables

The control variables used in this research as follows;

$SIZE_{it}$ is the size of the calculated from the natural logarithm of the assets of company i in the year t.

PE_{it}   is the price to earnings ratio of company i in the year t.
$$= \frac{Market\ price\ per\ share_{it}}{Earnings\ per\ share_{it}}$$

PBV_{it}   is the price to book value ratio of company i in the year t.
$$= \frac{Market\ price\ per\ share_{it}}{Book\ value\ per\ share_{it}}$$

$BETA_{it}$ is the systematic risk of company i in the year t.

ROA_{it} is the return on asset of company i in the year t.
$$= \frac{Net\ profit_{it}}{Total\ assets_{it}}$$

$INTEREST_t$ is the average interest rates of 4 banks, including Bangkok Bank, Thai Commercial Bank Limited, Krung Thai Bank Public Company Limited and Kasikorn Bank of each year.

i refers to a listed company.

t refers to year 2013, 2014, 2015, 2016, and 2017.

Equation

$$CAR_{i,t} = \alpha + \beta_1(DE_{i,t}) + +\beta_2(SIZE_{i,t}) + \beta_3(PE_{i,t}) + \beta_4(PBV_{i,t}) + \beta_5(BETA_{i,t}) + \beta_6(ROA_{i,t}) + \beta_7(INTEREST_t) + \epsilon_{i,j}$$

When

$CAR_{i,t}$ is the rate of cumulative abnormal return of the company i, year t

$DE_{i,t}$ is the total debt to equity ratio of the company i, year t

$SIZE_{i,t}$ is the size of the company i, year t

$PE_{i,t}$ is the price to earnings ratio of company i, year t

$PBV_{i,t}$ is the price to book value ratio of the company i, year t

$BETA_{i,t}$ is the market risk of the company i, year t

$ROA_{i,t}$ is the return on assets of the company i, year t

$INTEREST_{i,t}$ is the average interest rate in 4 banks year t

The t years consist of 2013, 2014, 2015, 2016 and 2017

Results

Descriptive Statistics

Table 1 shows descriptive statistics for all variables. On average, the listed companies in the Stock Exchange Thailand exhibit CAR, DE, SIZE, PE, PBV, BETA, ROA, and interest rate of -0.207 percent per year, 1.482 times, 4.069 baht, 52.656 times, 3.219 times, 0.818 times, 8.598 percent per year, and 1.797 percent per year, respectively. In addition, standard deviations are showed as 0.312 percent per year, 3.744 times, 0.736 baht, 74.971 times, 6.792 times, 0.648 times, 8.371 percent per year, and 0.525 percent per year, respectively.

Table 1. Descriptive statistics

Variables	Mean	Maximum	Minimum	Std.Dev.
CAR (%)	-0.207	2.500	-2.966	0.312
DE (times)	1.482	94.743	0	3.744
SIZE (baht)	4.069	6.372	-3.597	0.736
PE (times)	52.656	42354.70	0	743.971
PBV (times)	3.219	296.550	-14.156	6.792
BETA (times)	0.818	4.899	-3.7542	0.648
ROA (%)	8.598	21.570	-28.470	8.371
INTEREST (%)	1.797	2.725	1.375	0.525

*Size = ln Total Asset

Fixed Effect Regression Results
Assumptions underlying regression results

Table 2 displays multicollinearity results showing the Variance Inflation Factor (VIF) of less 8. Therefore, no multicollinearity problem is detected. Next, Breusch-Pagan-Godfrey method results in the P-value of Chi-Square being equal to 0.9688 which is greater than 0.95 confident level, meaning that there is no Heteroskedasticity problems. Based on the Durbin Watson test, it is found that the value is 1.761. When the calculated values are compared with Critical dL and dU, it is found that the value is between1.5-2.5. Therefore, this regression equation has no Autocorrelation problem.

Table 2. VIF and Tolerance values

Variables	VIF	Tolerance
DE	1.405	0.712
SIZE	1.061	0.942
PE	1.381	0.724
PBV	1.022	0.979
BETA	1.005	0.995
ROA	1.023	0.977
INTEREST	1.310	0.968

Relationship Results

Table 3 displays the results of Fixed Effect Regression. It is showed that DE is statistically negatively correlated with abnormal return at 0.05 level of significance, with the coefficient of -0.02686.This indicates that the more debt is, the more bankruptcy related cost increases. And such bankruptcy related cost is higher than the tax benefits. Therefore, the firm value reduces and consequently negatively affects abnormal return. Additionally, PE and PBV

are also statistically negatively correlated with abnormal return at significant level 0.10 and 0.05, respectively. The coefficients are found at -0.005 and -0.012, respectively. These imply that the more market value is, the less abnormal return exists. However, the relationship between size, beta, ROA, and interest rate has no statistically significant relationship with abnormal return. When considering the R-squared value of 12.32%, it indicates that 12.32% of the dependent variable-abnormal return can be explained by all independent variables. Moreover, the F-value is showed at 3.335 with P-value at 0.00, implying that the fitness of this model is significant.

Table 3. Multiple regression by Fixed Effects Regression test results

Explanatory Variables	Coefficients	t-Statistic	Prob.
Intercept	0.213758	0.983544	0.326770
DE	-0.02686	-2.27264**	0.024333**
SIZE	0.009533	0.450071	0.653246
PE	-0.005465	-3.15701*	0.061894*
PBV	-0.011817	-2.91144**	0.004092**
BETA	-0.02072	-0.5617	0.575078
ROA	0.00909	0.775878	0.438925
INTEREST	-0.18807	-1.22067	0.223942

R- squared = 0.1232 Adjusted R Square = 0.0863
F – statistic = 3.335164   Prob (F-statistic) = 0.000000   n = 220

Note:**,* denotes statistical significance at 0.05, 0.10, respectively.

According to the statistical results, here is the model constructed.

$$CAR_i = 0.213758 - 0.026865DE_i - 0.005465PE_i - 0.011817PBV_i$$

t-statistic: $(-2.272641)** \ (-3.157010)* \ (-2.91144)**$

Note: Numbers in brackets show t-statistic values.

Discussion and Conclusion

This research finds a negative relationship between capital structure (measured by DE) and abnormal return which can be explained by the Trade-off Model. When the company takes on more debt, it must face more financial risk or bankruptcy related costs. This leads to higher interest payments which decreases earnings and cash flow. In other words, due to the higher debt in the capital structure, the cost to such debt financing increases and the risk of default or bankruptcy increases as well. The research results also imply that tax benefits cannot outweigh bankruptcy cost. These are consistent with (Al-Shubiri,2010; Muradoglu and Sivaprasad,2012; Lisboa,2015 and Ullah and Shah,2014). However, due to the low corporate tax rate of the listed companies in Thailand (average 15% compared with 40% of U.S.A.), the tax benefits may not high enough to outweigh bankruptcy costs. Based on the results, investors should consider low DE, PE, and also PBV stocks for making investment decision. Because this research finds the negatively significant relationship between such three variables and abnormal return. The comparison among industries and the comparison between the Stock Exchange of Thailand (SET) and the Market for Alternative Investment (mai) should be further studied for more insights.

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